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## 2022-2023 ADDENDUM

### **Addendum to 2022-2023 Catalogue**

While every attempt has been taken to ensure the accuracy of the catalogue, sometimes changes must be made throughout the year that are in the interest of the students and/or the University.

This addendum details recent changes made after the posting of the 2022-2023 catalogue.

### **WNE 2022-2023 Catalogue Addendum**

Effective immediately, the following applies to all WNE students:

Qualifications for a Baccalaureate Degree

Complete an Application for Degree form, which will place the student's name on the list for October, December, May, or August degree conferral, as appropriate.

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## WESTERN NEW ENGLAND UNIVERSITY

### Western New England University

**2022-2023 Catalogue**  
1215 Wilbraham Road  
Springfield, Massachusetts 01119  
Telephone 413-782-3111 800-325-1122  
www.wne.edu

Western New England University is ranked among National universities by *U.S. News & World Report* in its "Best National Universities 2022," and "Best Online Programs 2022," and among the Top Undergraduate Engineering programs.

WNE has earned the prestigious classification among Doctoral/Professional Universities by the Carnegie Classification of Institutions of Higher Education.

The official 2022-2023 Western New England University Catalogue is online at <https://www1.wne.edu/academic-affairs/catalogue.cfm>

The following sections can only be found online:

- Undergraduate course descriptions
- Graduate course descriptions
- Scholarship information
- Legal matters
- Directories

### Disclaimer

#### The University Catalogue

The academic requirements and regulations of Western New England University are published in this official University catalogue and in other University announcements. This catalogue was prepared with information available at the time of publication and is subject to change. The University reserves the right to terminate programs or change its program requirements, content and sequence of courses, and program offerings. The University also reserves the right to change without notice its fees and charges, course offerings, academic policies, calendars, regulations, and other provisions cited in this publication.

The Provost and Senior Vice President for Academic Affairs is the official representative of the University in matters pertaining to the scholastic life of the student body. Regulations made by the Provost, in concert with the faculty, in addition to, in abrogation of, or in interpretation of the regulations stated herein have the same force as the regulations themselves. Further information and advice regarding academic regulations may be secured by inquiring in the Office of the

Provost and Senior Vice President for Academic Affairs or the Office of the Registrar.

The requirements to be met by a student are stated in the University catalogue current at the time of the student's initial matriculation or declaration of a major. Students are responsible (p. 20) for the information contained in the University catalogue; they are to be acquainted with and assume responsibility (p. 20) for all requirements of their degree program. Failure to read and comply with University regulations will not exempt students from those regulations. In case of ambiguity, discrepancy, or disagreement, the regulations stated in this catalogue and any subsequent modifications or interpretations by the Provost and Senior Vice President for Academic Affairs will prevail.

Students separating from the University completely for one year or more are bound by the catalog in effect when they re-enroll (p. 11).

The University is an Affirmative Action/Equal Opportunity Employer. (p. 454)

## A Message from the President

This is your time—a time to explore, to discover, and to imagine the unlimited possibilities that lie before you when you choose to earn your degree at Western New England University. This catalogue provides a roadmap for that journey.

We prepare students to adapt and succeed in a dynamic future by honoring the best in traditional education while being responsive to and invigorated by the challenges of the future.

All of that is possible because of our varied academic offerings. With Colleges of Arts and Sciences, Business, Engineering, Pharmacy and Health Sciences, and a School of Law, you can customize your WNE academic experience. Majors, minors, concentrations, and cross-disciplinary learning enable you to pursue your passions and your greatest ambitions and help you realize your unique value proposition. Every step along the way, we will be here for you with community-wide support from your professors, University staff, and your peers.

With a professionally-focused education, enhanced by the liberal arts and humanities, you will hone the skillsets and mindsets prized by today's employers—divergent thinking, social and emotional intelligence, empathy, and a sense of humanity. You will develop an entrepreneurial outlook as an innovator and problem-solver while creating value in all you do, no matter your major. You will apply what you learn through hands-on experiential learning—internships, field work, research, travel, and in service to others.

Above all, you will graduate work ready and world ready. WNE is ranked among National Universities by *U.S. News & World Report* in its “Best National Universities 2022” and among the Top Undergraduate Engineering programs. We have also been ranked 4th in Top Performers on Social Mobility among National Universities in Massachusetts, and among the 2022 Best Online Programs.

Your education here will not only equip you for your first job but also prepare you to navigate a career path spanning jobs both known and those that do not yet exist, all while continuously creating value.

At WNE, we are ready for the future. Let us take you there.

Robert E. Johnson, PhD

## About the University

Western New England University (WNE) is a private, nationally ranked, comprehensive institution with a focus on preparing work-ready and world-ready graduates. Founded in 1919 in Springfield, Massachusetts as a division Northeastern College, WNE's 215-acre suburban campus serves more than 3,700 students, including over 2,500 full-time undergraduates. More than 47,000 alumni have earned degrees through its 90+ undergraduate, graduate, and professional programs at Colleges of Arts and Sciences, Business, Engineering, and Pharmacy and Health Sciences, and School of Law. Students come from 38 U.S. states and territories and 22 countries. Of over 45,000 living alumni, about 30% remain within the region, residing in the four western Massachusetts counties and northern Connecticut.

WNE is classified among nationally ranked universities in *U.S. News & World Report*, and among its Top Undergraduate Engineering programs, and in the Doctoral/Professional Universities category in the Carnegie Classification of Institutions of Higher Education.

## Programs, Colleges, Faculty, and Students

Western New England University offers a wide range of undergraduate degree programs as well as graduate and doctoral programs in Arts and Sciences, Business, Engineering, Law, and Pharmacy. There are 213 full-time faculty members in the University's four Colleges and School of Law.

The University serves 3,674 students: 2,522 full-time undergraduates; 395 law students; 203 pharmacy students; 453 students in part-time undergraduate, graduate, and doctoral degree programs; and 74 occupational therapy students. The University attracts students nationwide from 38 states and territories and 22 countries. There are over 45,000 living alumni of the University.

## Our Mission

The hallmark of the Western New England experience is an unwavering focus on and attention to each student's academic and personal development, including learning outside the classroom. Faculty, dedicated to excellence in teaching and research, and often nationally recognized in their fields, teach in an environment of warmth and personal concern where small classes predominate. Administrative and support staff work collaboratively with faculty in attending to student development so that each student's academic and personal potential can be realized and appreciated. Western New England develops leaders and problem-solvers from among our students, whether in academics, intercollegiate athletics, extracurricular and cocurricular programs, collaborative research projects with faculty, or in partnership with the local community.

At Western New England, excellence in student learning goes hand in hand with the development of personal values such as integrity, accountability, and citizenship. Students acquire the tools to support lifelong learning and the skills to succeed in the global workforce. Equally important, all members of our community are committed to guiding students in their development to become informed and responsible leaders in their local and global communities by promoting a campus culture of respect, civility, tolerance, environmental awareness, and social responsibility. We are positioned well to accomplish these goals as a truly comprehensive institution whose faculty and staff have historically collaborated in offering an integrated program of liberal and professional learning in the diverse fields of arts and sciences, business, engineering, law, pharmacy, and occupational therapy.

## Our Core Values

- Excellence in Teaching, Research, and Scholarship
- Student-centered Learning
- A Sense of Community
- Cultivation of a Pluralistic Society
- Innovative Integrated Liberal and Professional Education
- Commitment to Academic, Professional, and Community Service
- Stewardship of our Campus

## Our Vision for Our Second Century

In 2019, Western New England celebrated its Centennial. At the dawn of our second century, our focus will continue to be on the whole student, but in a 21st century context highlighting the demands of a diverse and global society, the accelerating pace of technology, and the necessity of attention to environmental sustainability. Our continued evolution will be marked by a dedication to excellence, visionary thinking, flexibility, and entrepreneurial spirit. We must continue to develop as a comprehensive national university offering an integrated program of liberal and professional undergraduate and graduate education that prepares students for the future of work in career paths both known and that do not yet exist.

## A Brief History

The Springfield Division of Northeastern College, known as Springfield-Northeastern, was established in 1919. Evening classes, held in the YMCA building on Chestnut Street in Springfield for students studying part-time, were offered in law, business, and accounting. The first 13 graduates were recognized in 1922 with the degree of Bachelor of Commercial Science. In 1923, the first seven law graduates were recognized.

On July 17, 1951, the Springfield Division of Northeastern University was chartered and became Western New England College.

On April 26, 1956, 34 acres for the current Wilbraham Road campus were purchased. The first building, originally known as East Building, and later renamed Emerson Hall in recognition of the University's first trustee chairman, Robert R. Emerson, opened in 1959.

Western New England received institutional accreditation in 1965 and has been continuously accredited since then.

The University flourished on its new campus. The decades of the sixties, seventies, eighties, and nineties saw Western New England's academic programs expanding, its student body growing, and the addition of a number of buildings including the D'Amour Library, the Blake Law Center, the St. Germain Campus Center, the Alumni Healthful Living Center, and the LaRiviere Living and Learning Center. In 2001, the Evergreen Village townhouses opened for seniors. In 2002, the Kevin S. Delbridge Welcome Center opened, housing the admissions offices. Commonwealth Hall was added in 2003, along with the Golden Bear Stadium. The George Trelease Memorial Baseball Park was completed in 2004. A \$1.9 million addition to the D'Amour Library was completed in 2005 and a \$5.5 million addition and renovation of the Blake Law Center in 2008.

In 2008, Western New England launched its first PhD program in Behavior Analysis. The following year, the institution opened Southwood Hall, a new eco-friendly residence hall for

upperclassmen. The \$40 million Center for the Sciences and Pharmacy opened in 2011.

On July 1, 2011, the institution officially became a university. The Schools of Arts and Sciences, Business, and Engineering became known as “Colleges,” while the School of Law retained its name.

In 2011, the Western New England University College of Pharmacy welcomed its first class to the PharmD program. The College of Engineering added the University’s second doctoral program: the PhD in Engineering Management in 2012.

The period of 2012-2014 saw a major renovation to Arts and Sciences’ Herman Hall, and modernization and expansion to Engineering’s Sleith Hall designed to elevate our classroom and laboratory environments.

In 2017, the College of Pharmacy was restructured to become the College of Pharmacy and Health Sciences, as it welcomed the first cohort to the Doctor of Occupational Therapy Program.

In 2018, the University completed the largest construction project in its history: the University Commons.

In 2019, Western New England University celebrated its Centennial. Currently, WNE is entering its second century with a vision to create a “New Traditional University.”

In 2021, Western New England University was ranked among national universities by *U.S. News & World Report* in its Best National Universities 2021 and among the Top 100 Undergraduate Engineering programs. Also in 2021, the University officially dedicated the Anthony S. Caprio Alumni Healthful Living Center in honor of our fifth president, Anthony S. Caprio, following his retirement from the University.

The University enrolls approximately 3,674 students and has over 45,000 living alumni around the world.

## Educational Opportunities

The University provides students with an impressive range of educational options. Each program is unique in its integration of liberal arts and professional education, theory, and practice. Some programs prepare students for successful careers in business, industry, and for continued study in graduate school. In others, students receive hands-on, experiential learning through internships, work with faculty on their own research, and interactions with organizations in the community. There is an emphasis on the integration of technology in all programs, and students are provided with an increased international perspective to prepare for work in today’s global economy.

The faculty and staff are dedicated to personal interaction with students and to fostering an open environment conducive to personal growth. In addition to a wide range of academic programs, Western New England University also provides academic and other support services for students needing assistance in their studies and for those with accessibility challenges.

The University provides opportunities for both semester-long and short seminar study abroad opportunities in England, China, France, Italy, South Africa, and many other countries. Furthermore, the University is located in an urban community with rich educational and cultural resources, and it participates in the Cooperating Colleges of Greater Springfield (CCGS), a consortium of colleges in which educational opportunities are enhanced through the sharing of resources.

## Campus and Facilities

The campus is located in a residential section of Springfield at 1215 Wilbraham Road, about four miles east of downtown Springfield.

The campus includes 28 major buildings and numerous athletic and recreational fields.

The new University Commons features a Starbucks® Café, Spirit’s Sandwiches and Subs, a food court and convenience store, Faculty/Staff Bear’s Den, meeting rooms, and two levels of student food stations.

The St. Germain Campus Center is home to the Blue & Gold Bookstore, and the offices of First Year Students & Students in Transition, International Students, Dean of Students, Spiritual Life, Inclusive Excellence, Student Involvement and Leadership, and the Career Center.

The University maintains 10 residence halls and apartment complexes that accommodate students in varied housing styles.

Facilities for intramural and intercollegiate athletics are available on the campus. Included are tennis courts, softball and baseball diamonds, and soccer fields. The University’s multipurpose turf stadium serves varsity sports including football, field hockey, and lacrosse. The George E. Trelease Memorial Baseball Park provides an outstanding facility for the Golden Bears. A variety of athletic, recreational, and health-related activities are conducted in the Caprio Alumni Healthful Living Center, which serves the entire University community. The Golden Bear Pavilion, opened in 2015, includes training and equipment rooms, a concession stand, and a public restroom.

### D’Amour Library

The D’Amour Library, which opened in 1983 and was expanded in 2005, offers users an inviting atmosphere for research and group and individual study. There is abundant study space in the library. In addition to individual and group tables and soft seating, there are several individual study rooms as well as several group rooms for collaborative projects. Sixty public computers located throughout the library’s three floors provide access to the internet and to a variety of software applications. Three computer classrooms, including the Business Analytics Center that was constructed in the summer of 2016 to support the University’s SAP certification program and Business Analytics and Information Management major, provide access to 81 additional computers when not in use for teaching. The 38-seat computer classroom on the ground level of D’Amour serves as a 24/7 computer lab for all current students who use their student IDs to access the building whenever the library is closed. The campus wireless network is accessible throughout the library.

The library offers the undergraduate and graduate students a curriculum-based collection of over 115,000 book, journal, and media titles and provides online access to over 739,600 digital books, streaming media, and e-journal titles; all of the resources are findable using the library’s online discovery system Find It! @ D’Amour. In addition to the resource-rich discovery platform, D’Amour Library subscribes to 96 electronic databases, including 25 health sciences-related ones, that provide access to general and discipline-specific content, with the full-text of many of the resources available online. Articles from the databases and from other online resources may be printed in the library at one of the seven available network printers. Off-campus access to the online databases is available to current students, faculty, and staff of Western New England University 24 hours a day.

The library’s professional staff offers a full range of information



services. Information literacy classes are offered by instruction librarians at the request of faculty to support research and writing assignments in their disciplines as well as to fulfill the general University information literacy requirement. In addition to formal instruction, librarians also provide reference assistance 66 hours per week, including weeknights and weekends, during the academic year. Longer, individual reference appointments may be scheduled for more in-depth research.

The library is open seven days a week during the academic year. Holidays, summer hours, and exception days are posted in the library and on the library's website.

#### The Law Library

Renovated and expanded in 2008, the three-story School of Law Library offers an extensive collection of print and electronic resources, as well as a highly trained and dedicated staff to assist students and faculty members in their research. The Library's collection of approximately 364,000 volumes includes current research and reference resources; reprints of important historical texts; electronic databases including LexisNexis, Westlaw, and Bloomberg Law; microforms; and selected audio and video materials. The Library is also a selective depository for federal government publications.

The Library is open more than 90 hours per week. The only academic law library in western Massachusetts, this rich resource is valued by students, professors, and area legal professionals.

### Professional and Regional Accreditation

The New England Commission of Higher Education (NECHE) regionally accredits Western New England University and all of its programs. In addition, our professional programs are accredited by the following organizations:

Accreditation Board for Engineering and Technology (ABET)  
Accreditation Council for Occupational Therapy Education (ACOTE)  
Accreditation Council for Pharmacy Education (ACPE)  
American Bar Association (ABA)  
Association to Advance Collegiate Schools of Business (AACSB)  
Massachusetts Department of Education (Mass DOE)

#### In Arts and Sciences:

Programs in Education are approved by the Massachusetts Department of Elementary and Secondary Education, [www.doe.mass.edu](http://www.doe.mass.edu), and meet the standards of reciprocity of the Interstate Certification Compact.

#### In Business:

The College of Business is accredited by AACSB International—The Association to Advance Collegiate Schools of Business.

Western New England University is the only private AACSB International-accredited university in western Massachusetts. With accreditation, Western New England University is among an elite company of accredited business schools, which comprise 5% of business programs worldwide.

#### In Engineering:

The Bachelor of Science in Engineering degrees with majors in Biomedical, Civil, Computer, Electrical, Industrial and Mechanical Engineering are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET), [www.abet.org](http://www.abet.org).

#### In Law:

The School of Law is accredited by the American Bar Association (ABA) and is a member of the Association of American Law Schools (AALS).

#### In Pharmacy:

The Western New England University Doctor of Pharmacy program is accredited by the Accreditation Council for Pharmacy Education, 135 South LaSalle Street, Suite 4100, Chicago, IL 60503, 312/664-3575; FAX 312/664-4652, web site [www.acpe-accredit.org](http://www.acpe-accredit.org)

#### In Occupational Therapy:

At its meeting on December 6-8, 2019, the Accreditation Council for Occupational Therapy Education (ACOTE) reviewed the Report of On-Site Evaluation (ROSE) regarding the Doctor of Occupational Therapy Program (OTD) at Western New England University, Springfield, Massachusetts, and the letter of comment submitted by the program. All Standards were found to be compliant and ACOTE voted to Grant a Status of Accreditation for a period of 7 years.

The entry-level OTD Program is accredited by the Accreditation Council for Occupational Therapy Education (ACOTE) of the American Occupational Therapy Association (AOTA), located at 6116 Executive Boulevard, Suite 200, North Bethesda, MD 20852-4929. ACOTE's telephone number c/o AOTA is (301) 652-AOTA and its Web address is [www.acoteonline.org](http://www.acoteonline.org). Graduates of the program are eligible to sit for the national certification examination for the occupational therapist administered by the National Board for Certification in Occupational Therapy (NBCOT). After successful completion of this exam, the individual will be an Occupational Therapist, Registered (OTR). In addition, all states require licensure in order to practice; however, state licenses are usually based on the results of the NBCOT Certification Examination. Note that a felony conviction may affect a graduate's ability to sit for the NBCOT certification examination or attain state licensure.

#### Membership

Western New England University is a member of the Association of American Colleges and Universities, the College Entrance Examination Board, the Association of Governing Boards of Universities and Colleges, the Council of Independent Colleges, the National Association of Independent Colleges and Universities, and the Association of Independent Colleges and Universities of Massachusetts.

### Technology Services

The Office of Information Technology (OIT) provides a full range of technology and technology related services to the University.

The University boasts the latest state-of-the-art technology, including fully digital classrooms, laboratories, and equipment. Over 500 public computers are available for use throughout campus. In addition, a wireless network is available in all residence halls and campus buildings, as well as most outdoor areas on campus.

There are numerous learning technologies available for faculty and students to enhance instructional capabilities including a learning management system, lecture capture solutions, distance learning capabilities, and numerous University software licenses supporting our various disciplines. For more information visit our “Teaching and Learning” page at <https://www1.wne.edu/information-technology/teaching-learning/index.cfm>.

For a printable document describing technology services please view the University's "*OIT Handbook*" at [https://www1.wne.edu/information-technology/policies\\_doc/doc/OIT\\_Handbook.pdf](https://www1.wne.edu/information-technology/policies_doc/doc/OIT_Handbook.pdf)

For a complete list of all Information Technology resources, policies, and services visit <https://www1.wne.edu/information-technology/index.cfm>

## ADMISSIONS

### Undergraduate Admissions for Full-time Enrollment

#### How to Learn More About Western New England University

Prospective students and parents are encouraged to visit the campus and to avail themselves of the opportunity for a personal interview and tour. Students and parents also have the opportunity to attend a series of Open House programs. These programs are held on selected Saturdays and Sundays and include a tour of the campus. Currently enrolled students conduct the tours and can provide applicants with a personal perspective of the University and student life. While an interview is not required, the University encourages students to arrange for a personal interview at the Admissions Office.

In addition to a campus visit and the University literature, information is available electronically at [www.wne.edu/admissions](http://www.wne.edu/admissions).

The Admissions Office can be contacted through the following means:

Telephone: 800-325-1122, ext. 1321 or 413-782-1321

Fax: 413-782-1777

Email: [learn@wne.edu](mailto:learn@wne.edu)

#### How to Apply for Full-time Admission

The following procedure should be completed for admission as a freshman or transfer student for full-time study (12 credit hours or more per semester).

1. Students should submit a completed application. An application can be submitted online through our website ([www.wne.edu/admissions](http://www.wne.edu/admissions)). Students can also download an application from the website or complete the Common Application.
  2. The completed application form should be returned with the nonrefundable \$40 application fee.
  3. Students should forward to the Admissions Office an official high school transcript(s). First term senior grades may be required for some students. Transfer students should forward official transcripts of final secondary work, as well as any previous undergraduate study, to the Admissions Office.
  4. Results of the SAT I or ACT examinations should be forwarded to the Admissions Office. The CEEB number for the SAT is 3962; the college code for the ACT is 1930.
  5. A recommendation from a guidance counselor or teacher is required.
  6. Applicants should submit a personal statement, essay, or untimed writing sample of your choice (at least 250 words).
3. Students should have their school forward to the Admissions Office an official English translation of the high school transcript(s) as well as an official transcript of first term senior grades when available. Transfer students should have their school forward to the Admissions Office an official English translation of transcripts of final secondary school work as well as any previous undergraduate study.
  4. The official results of the Test of English as a Foreign Language (TOEFL) should be forwarded to the Undergraduate Admissions Office. IELTS, EIKEN, or PTE Academic scores will also be accepted. SAT or ACT scores can be submitted instead of the other assessments. English proficiency can also be shown by submitting proof of completion of an Intensive English program that we have an agreement with. You can find a list of these programs on our website.
  5. An Affidavit of Support form must be submitted to the Admissions Office.
  6. An official bank statement declaring that the financial sponsor has sufficient funding to support the student's education at Western New England University should be submitted on the bank's stationery.
  7. A recommendation from a guidance counselor or teacher is required.
  8. A copy of the student's passport should be provided.

The I-20 Form will be issued to an accepted international student.

#### Specific Requirements for the Various Colleges

Persons admitted as regular degree-seeking candidates must have graduated from an approved secondary school or have obtained a General Equivalency Diploma (GED). They must also have successfully completed the following minimum preparatory units:

#### *College of Arts and Sciences*

The College of Arts and Sciences requires four units English; one unit laboratory science; two units mathematics equivalent to two of the following: algebra I, geometry, or algebra II; one unit United States history.

1. One unit of chemistry and one unit of biology are required for prospective majors in biology, chemistry, health sciences, health studies, forensic biology, forensic chemistry, neuroscience, pre-occupational therapy, undergraduate pharmacy, and pre-physician assistant. In addition, one unit of physics is recommended for prospective majors in chemistry, forensic chemistry, health sciences, neuroscience, undergraduate pharmacy and pre-physician assistant.
2. Prospective majors in biology, health studies, pre-occupational therapy, computer science, information technology, and neuroscience are required to present three units of mathematics; a fourth year is recommended.
3. Prospective majors in chemistry, forensic biology, forensic chemistry, health sciences, mathematics, undergraduate pharmacy, and pre-physician assistant are required to present four units of mathematics. One unit must be the equivalent of a pre-calculus course. Students must arrive calculus-ready.

#### Application Procedure for International Students

International students who are proficient in the English language and who wish to be considered for admission should comply with the following procedure:

1. Students should submit a completed application. An application can be submitted online through our website ([www.wne.edu/admissions](http://www.wne.edu/admissions)). Students can also download an application from the website or complete the Common Application.
2. The completed application form should be returned with the nonrefundable \$40 application fee (U.S. dollars).

### *College of Business*

The College of Business requires four units English; one unit laboratory science; three units mathematics equivalent to algebra I, geometry, and algebra II; one unit United States history.

### *College of Engineering*

The College of Engineering requires four units English; one unit United States history; four units mathematics equivalent to algebra I, geometry, algebra II, and an additional year beyond algebra II (such as precalculus) which includes trigonometry; one unit laboratory science; and one unit physics or chemistry (preferably both). Students must arrive calculus ready.

#### When Admission Decisions Are Made

Western New England University begins accepting students for the fall semester in October. The Undergraduate Admissions Office continues to review applications until the class is filled. The University also enrolls students midyear. Acceptance for the January semester begins in early fall.

#### When It Is Necessary to Declare Enrollment Intentions

A nonrefundable tuition deposit of \$100 is required by May 1 from each student who has been accepted. Students who plan to live on campus must submit an additional \$300 nonrefundable housing deposit at the same time. These fees are deducted from the total charges. After the tuition deposit has been paid, the following are required prior to registration:

1. Physical examination form including immunization verification completed by the applicant's healthcare provider.
2. Verification of health insurance coverage, in compliance with Massachusetts state law, or participation in the University's insurance program.

#### Transfer Credit Evaluation

The number of transfer credits is based upon work completed at previous accredited institutions. The status of transfer students is not automatically determined by the number of credit hours already earned or by the nomenclature of courses taken. Rather, each transcript is evaluated on a course-by-course basis. Normally, credit is allowed for each course that is equivalent to a corresponding course at Western New England University provided the earned grade is C- or above. Within a few weeks of acceptance, the Undergraduate Admissions Office sends each transfer student a degree audit, which shows how each previous course applies to the student's specific degree program at Western New England University. In certain English and Mathematics courses, application of transfer credit may be subject to completion of additional assessment.

Up to 70 credits are acceptable in transfer from two-year colleges, and up to 90 credits from four-year colleges and universities (including any applicable two-year college credits).

The College of Business requires that the majority of credits, contact hours, or other metric in traditional business subjects counted toward the degree fulfillment be earned at Western New England University.

#### Transfer Students' Degree Requirements

Customarily, a student who has received an associate's degree in an approved program from an accredited college and who is accepted for admission will be granted junior status. Although it is often possible for such a student to complete a program in a chosen field within two years at the University, the specific requirements of some majors may require a longer period of study. It is necessary for a transfer student to complete at least one year (30 credit hours) of study at Western

New England University in order to be granted a degree. Students transferring to Western New England University may follow the requirements of their chosen major using the year when they become a student at Western New England University or the year when they first matriculated at their first college if less than four years prior to the transfer to Western New England University. This decision will be made by the student and approved by the chairperson of the major program.

#### Advising for Transfer Students

Prior to actual enrollment, transfer students may seek advice from several distinct vantage points. General transitional guidance is most often sought from the Office of First Year Students & Students in Transition. It is here that much of pre-enrollment advising is coordinated. In most cases, formal communication begins in early May for fall admission and in December for spring semester entry. This office also serves as the point of contact for initial course registration and pre-matriculation orientation. In addition, transfer students may contact the Dean's Office of the College in which the desired major is administered, particularly if there are questions regarding transfer credit and planning remaining academic work. Issues pertaining to changing curriculum choice prior to matriculation are typically handled through the Admissions office.

#### Joint Admissions

The Joint Admissions Program is offered in collaboration with the following community colleges: Berkshire, Greenfield, Holyoke, and Springfield Technical. The program is designed to facilitate the transfer of students earning an associate's degree from a designated community college. Eligible students are conditionally accepted to Western New England University upon enrolling in the program. An emphasis is placed on advisement to ensure the maximize transfer credit is applied towards an approved major, and to ensure a smooth transition to Western New England University. Participating students must earn a minimum 2.3 cumulative grade point average (based on a 4.0 scale) and either the associate's degree or a minimum of sixty (60) semester hours. Students are subject to the same transfer credit restrictions that apply to traditional applicants.

#### Transfer Articulation Agreements

Transfer articulation agreements have been arranged between Western New England University and various community and junior colleges. Associate's degree graduates who have followed the prescribed programs of study at these specific institutions may be able to complete requirements for baccalaureate degrees in two years at Western New England University.

#### Reactivation Procedure

Students who wish to return to Western New England University after an absence of one or more full semesters (fall or spring), may do so by submitting a Request for Reactivation Form to their Dean's Office. Students who wish to return to the University but change their major should also submit a Request for Change of Academic Program Form, along with the Request for Reactivation Form, to the Dean's Office of the program in which they wish to enroll.

Students must also submit official transcripts to Enrollment Services (for work completed) and unofficial transcripts (for work in progress) from all school(s) attended since leaving WNE. Reactivation may be contingent upon successful completion of coursework taken while away from the University.

Students are academically eligible to return if they left WNE in Good Standing, on Academic Warning, Academic Probation, or if they completed any mandated Academic Suspension. Students who were

academically dismissed are ineligible for reactivation since this status is a permanent separation from the University.

Students readmitted to the University after an absence of at least one year will follow the degree requirements outlined by the catalogue in effect at the time of re-enrollment.

In order to be eligible for Priority Registration, students are encouraged to submit all required paperwork by February 1 for Summer or Fall reentry, or by September 15 for Winter or Spring reentry.

## Undergraduate Admissions for Part-time Study

### Part-time Day and Evening Study

#### How to Apply for Admission to Part-time Study

The Admissions Office oversees admission to part-time study. Students are accepted on a rolling admissions basis.

1. Application forms for part-time study may be obtained from the Admissions Office, or electronically from the Graduate Studies and Adult Learning link at [www.wne.edu/admissions/graduate](http://www.wne.edu/admissions/graduate)
2. A completed application includes:
  - The completed, signed application form
  - The nonrefundable \$40 application fee
  - An official high school transcript or proof of the achievement of high school equivalency
  - An official transcript from each institution of higher education attended
  - A letter of recommendation
3. Applicants may be required to complete specific college-level courses in a nondegree status prior to formal admission.
4. Students admitted to part-time status may register for day, evening, or online courses.

### Undergraduate

Western New England University has a long tradition of providing continuing education for students who seek part-time day and evening study, those who are older than 18- to 22-year-old full-time students, and those who are beginning or returning to higher education after spending time in other pursuits.

The University may accept qualified part-time students into its daytime undergraduate degree programs.

### Undergraduate Nondegree Courses

Temporary nondegree status is available for students who wish to explore new subject areas before entering a degree program or earn credit prior to formal admission. This is also an option for visiting students from other colleges and universities who satisfy admissions requirements. Students must maintain an average of at least 2.0 (C) in courses taken at Western New England University. Students may enroll in a maximum of 36 credits under nondegree status. Advising and registration of nondegree students takes place in the Colleges.

## Graduate Admissions

### How to Apply for Admission

Admission to all graduate degree programs at Western New England University requires an earned baccalaureate from an accredited college or university and additional materials as described below. Applicants to a number of the master's programs may be admitted for any term on a rolling admissions basis. However, some graduate programs will have specific entry points for when candidates will begin their studies. Please reference the graduate studies website for further information. The application process and admission to the JD and LLM programs in the School of Law are described in materials available directly from the School of Law.

The application process and admission to the Doctor of Pharmacy and Doctor of Occupational Therapy programs are described in materials available directly from the College of Pharmacy and Health Sciences.

**Graduate Transfer Credit.** Students who have earned graduate credit before they apply to Western New England University may request the transfer of a maximum of six credit hours for 30-credit master's programs or 12 credit hours for master's programs comprising at least 36 credits. The minimum required grade for transfer is B (3.0). Final award of graduate transfer credit is at the discretion of the dean responsible for the applicant's degree program.

**Credit Earned in Nondegree Graduate Status.** Graduate credit earned at Western New England University in nondegree graduate status may be applied toward graduate degree requirements up to a normal limit of six credit hours. The minimum grade is B (3.0).

**Time Limits.** Accepted graduate credits may be applied toward graduate degree requirements for no more than eight years. For example, an acceptable graduate course completed in the fall term of 2021 counts toward graduation only until the end of the 2029 summer term.

### Application Procedures for Graduate Programs:

1. Apply online at [wne.edu/gradapp](http://wne.edu/gradapp).
2. Arrange to have official college/university transcripts sent directly to Graduate Admissions from all institutions attended.
3. Arrange to have other documents, such as letters of recommendation or official test score reports, sent directly from the reporting person or agency as described below for the specific degree programs.
4. Completed applications are reviewed by the Graduate Admissions Committee of the appropriate College.

### College of Arts and Sciences

#### Master of Arts in Mathematics for Teachers and Master of Arts in English for Teachers

The Master of Arts in Mathematics for Teachers and Master of Arts in English for Teachers programs are designed primarily for secondary and middle school teachers in the specific disciplines. These programs are also available to candidates with an interest in further study in either mathematics or English in nonteaching fields.

The requirements for the Master of Arts (MA) degrees are:

1. a baccalaureate degree from an accredited college or university;
2. an overall undergraduate grade point average (GPA) of at least 2.5 (a GPA of 3.0 in the major is preferred for both programs);

3. an academic or professional background equivalent to at least a minor in mathematics for the MA in Mathematics for Teachers program or in English for the MA in English for Teachers program. Further, it is preferable that applicants have either a Provisional or Initial License in teaching. Applicants lacking an undergraduate major in mathematics or English may have to take more than ten courses in order to complete the corresponding program;
4. a minimum of two letters of recommendation, at least one of which must be from the candidate's supervisor;
5. a current curriculum vitae; and
6. submission of a personal statement.

Applicants who do not meet the GPA requirement or GRE requirement may be considered for admission based on other aspects of their application.

#### **Master of Science in Applied Behavior Analysis**

Developed in response to the increasing demand for teachers and practitioners trained in best practices for the education and treatment of individuals with autism and related disabilities, the Master of Science (MS) Program in Applied Behavior Analysis at Western New England University will give working professionals the skills needed to work with this population. Through a combination of coursework and supervised practical experiences, students completing this program will earn a Master's degree in Applied Behavior Analysis and meet the Behavior Analysis Certification Board (BACB) requirements for taking the exam to become Board Certified Behavior Analysts.

The requirements for the MS in Applied Behavior Analysis are:

1. a minimum of a bachelor's degree, and at least a 3.0 grade point average in their bachelor's program;
2. a combined score of 300 on the verbal and quantitative sections of the GRE;
3. three letters of recommendation;
4. submission of a personal statement; and
5. a current curriculum vitae.

#### **Doctor of Philosophy in Behavior Analysis**

Developed in response to the increasing demand for scientists and practitioners of evidence-based methods for the education and treatment of individuals with autism and related disabilities, the PhD program in Behavior Analysis at Western New England University will give you the skills to become a leading voice in the field. Through a combination of coursework and supervised practical and research experiences, the aim of the Department of Psychology is to train researchers and scientist-practitioners in the discovery, translation, and application of knowledge toward solving human behavior problems of societal importance (e.g., autism and related disabilities). All classroom course work is done at the New England Center for Children.

The requirements for the PhD in Behavior Analysis are:

1. A master's degree in behavior analysis, or certification as a master's-level behavior analyst by the Behavior Analysis Certification Board;
2. A minimum of a 3.6 grade point average (GPA) in master's degree program. (Tentative acceptance is allowed for having a GPA between 3.25 and 3.6, if other criteria are above minimal criteria.);

3. A combined verbal and quantitative score of 300 on the Graduate Record Exam (GRE) with neither score being below 150 for full admission (Tentative admission is allowed if either score is less than 150, if other criteria are above minimal criteria.);
4. Three letters of recommendation;
5. Submission of a personal statement; and
6. A current curriculum vitae.

#### *College of Business*

For the Master of Business Administration (MBA), the Master of Science in Accounting, the Master of Science in Organizational Leadership, and the Master of Science in Sport Leadership and Coaching degrees, the requirements are:

1. A baccalaureate degree from an accredited college or university.
2. An official score report for the Graduate Management Admissions Test (GMAT) taken not more than five years prior to the application date, or satisfaction of exemption as indicated below:
  - a. The completion of a graduate degree, master's, or doctorate, from an accredited college or university with quantitative coursework (six or more credits), averaging a GPA of 3.0 or higher.
  - b. Completion of a bachelor's degree from Western New England University or an AACSB accredited program with a GPA of 3.3 or higher. If you attended multiple institutions, your GPA will be based on the cumulative GPA of all institutions attended. The waiver will be granted if your earned bachelor's degree is no more than five years prior to your application date. In order to be eligible for the waiver, if you have taken Western New England University graduate courses as an undergraduate, you must have a minimum "B" or 3.0 in EACH course (NOTE: Tentative GMAT Waiver and Admit Status: While finishing your Western New England University degree, you must maintain an undergraduate GPA of 3.3 and a minimum of "B" or 3.0 in EACH Western New England graduate course if tentatively admitted during senior year.)
  - c. Completion of a Juris Doctor degree from an ABA accredited program.
  - d. Acceptable Graduate Record Examination (GRE) score.
  - e. Currently enrolled in the Western New England University School of Law JD program in good academic standing. Arrange for a copy of LSAT report to be sent from the School of Law to the Admissions Office.
  - f. Have passed all sections of the Uniform CPA Exam.
  - g. Current professional certification. Approved professional certifications: Certified Public Accountant (any state), Certified Management Accountant, Certified Network Engineer, Certified Professional Engineer, Certified Integrated Resource Manager, Certified in Production and Inventory Management, Certified Financial Planner, Certified Financial Analyst, Certified in Financial

Management, Registered Pharmacist, Project Management Professional, Registered Nurse, Six Sigma Green Belt or higher, Fellow of Society of Actuaries.

h. A minimum of four years of professional experience which is reflected in a résumé and written statement that demonstrates:

- Career progression toward senior levels of management (Evidence of leadership, supervisory, and decision-making skills)
- Increasing Budgetary Responsibilities (Not tracking but oversight, planning, and revenue forecasting and resource allocation)

i. For the MS in Organizational Leadership, successful completion of the Leadership Certificate with a B (3.0) GPA and no grade lower than “B.”

j. For the MS in Sport Leadership and Coaching, successful completion of the Sport Leadership Certificate with a B (3.0) GPA and no grade lower than a “B.”

3. Two letters of recommendation
4. Submission of two essays
5. A current curriculum vitae

For the Graduate Leadership Certificate and Graduate Sport Leadership Certificate, the requirements are:

1. An undergraduate degree with GPA of 3.0 or higher
2. Personal statement

### *College of Engineering*

#### **Master's Programs**

For programs leading to the Master of Science in Engineering in Civil, Electrical, Industrial, or Mechanical Engineering, and the Master of Science in Construction Management or Engineering Management, the requirements are:

1. the graduate programs in engineering require a baccalaureate degree in engineering, or a closely related field, from an accredited college or university. Those seeking admission to the master's programs without such a degree may petition to have their baccalaureate degree and professional experience accepted as a substitute;
2. a grade point average in the last half (usually 60 credit hours) of undergraduate work of a minimum of B (3.0);
3. two letters of recommendation from persons acquainted with the applicant's business, professional, or academic achievements; and
4. current résumé.

#### **Doctoral Programs**

**The Doctor of Philosophy (PhD) in Engineering Management** focuses on developing skills needed to conduct rigorous research in areas related to the improvement, design, and management of projects and programs within complex human-technological systems. These systems include engineering systems, health care systems, service systems, and logistical/transportation systems. Through a combination of coursework and directed research, the Department of Industrial Engineering and Engineering Management will provide a solid foundation and depth of engineering management theory and practice, provide breadth and depth across multiple types of human technological systems, and contribute to the body and knowledge in engineering management.

The requirements for the PhD in Engineering Management are:

1. possession (or nearing the completion) of a master's or bachelor's degree in engineering science, or a closely related discipline. Non-engineer applicants may gain conditional admittance that requires successful completion (B or better) of a set of leveling courses as determined by the PhD Admission Committee;
2. competence in at least one structured programming language: (R, Python, C++, etc.);
3. evidence of completion of the following course (C or better); Probability and Statistics;
4. a minimum cumulative grade point average of a 3.5 in all graduate work or a minimum undergraduate cumulative grade point average of a 3.5. Tentative acceptance is allowed for candidates having a GPA between 3.0 and 3.5;
5. a Graduate Record Exam (GRE) score from the last five years with a combined verbal and quantitative score of 300, and a quantitative score in at least the 50th percentile.
6. current curriculum vitae; and
7. two letters of recommendation.

**The Doctor of Philosophy (PhD) in Industrial Engineering** is a thesis-based, research-oriented degree for candidates who intend to pursue careers in Organizational Management, Research and Development, Research Management, or Academia. The program is intended to be versatile and tailored to support individual research initiatives. Course requirements are established by the doctoral committee. Areas of research include Manufacturing, Advanced Production and Inventory Modeling, Supply Chain, Advanced Manufacturing Systems, Quality Control and Analysis Systems, System Risk and Safety, as well as a wide breadth of topics that are defined by the student and advisor. A combination of coursework, milestone examinations, and independent research culminate into a dissertation in which candidates will gain the foundation and depth of industrial engineering theory and practice.

The requirements for the PhD in Industrial Engineering are:

1. possession (or nearing the completion) of a master's or bachelor's degree in Industrial Engineering or closely related discipline with a GPA of 3.5 or greater (4.0 scale);
2. a Graduate Record Exam (GRE) score from the last five years is required, with scores that place the student in the 60% percentile in each of the three areas of testing. Candidates having scores below the established GPA and GRE requirements will be considered on a case-by-case basis upon petition;
3. evidence of completion of a probability and statistics course with a grade of at least a “B”;
4. competence in at least one structured programming language (R, Python, C++, etc.);

5. Current curriculum vitae; and
6. Two letters of recommendation.

The **Doctor of Philosophy (PhD) in Mechanical Engineering** focuses on opportunities for candidates to develop levels of expertise and knowledge consistent with a career of technical leadership. One goal of the program is to prepare graduates with appropriate technical depth and breadth of knowledge and experience in order to become researchers and practitioners in mechanical engineering and technology. Areas of research include Mechatronics and Robotics, Thermo-fluids and Energy, Vibrations and Mechanics, Energy Systems, Novel Materials for energy and environmental applications, and Design and Manufacturing. A combination of coursework and independent research culminate into a dissertation in which a candidate will gain the foundation and depth of mechanical engineering theory and practice.

The requirements for the PhD in Mechanical Engineering are:

1. possession (or nearing the completion) of a master's or bachelor's degree in Mechanical Engineering, or a closely related discipline. Students seeking admissions to the PhD program will have an undergraduate and/or graduate academic record that demonstrates outstanding performance;
2. a Graduate Record Exam (GRE) score from the last five years, with a combined verbal and quantitative score of at least a 300 with a quantitative score in at least the top 40th percentile will be required for consideration. Candidates having scores below the established GRE requirement will be considered on a case-by-case basis upon petition;
3. current Resume/Curriculum Vitae; and
4. two letters of recommendation.

#### **Graduate Engineering Certificates**

1. a baccalaureate degree in engineering, or a closely related field, from an accredited college or university. Those seeking admission to a certificate program without such a degree may petition to have their baccalaureate degree and professional experience accepted as a substitute; and
2. a current résumé.

#### *College of Pharmacy and Health Sciences*

The College of Pharmacy and Health Sciences (COPHS) offers a full-time, four year Doctor of Pharmacy program. A total of 146 academic credits are required for graduation. The COPHS also offers a full-time, three year entry-level Doctor of Occupational Therapy program. A total of 109 academic credits are required for graduation.

Additional information is available by contacting:

Office of Student Affairs  
Western New England University College of Pharmacy and Health Sciences  
1215 Wilbraham Road  
Springfield, MA 01119  
413-796-2113 or email: [healthprofessions@wne.edu](mailto:healthprofessions@wne.edu)

#### **The Doctor of Pharmacy Program**

The Doctor of Pharmacy curriculum uses today's best practices to enhance learning and provides firsthand experience in our technologically advanced labs, in various types of pharmacy settings, and through service opportunities in the community. Students will learn the technical, social, and administrative aspects of pharmacy as well as develop the skills needed to become a healthcare leader

#### **How Admissions Decisions Are Made**

The admissions decision is based on a thorough review of submitted application materials, including GPA for required prerequisite coursework, PCAT composite score (if submitted), letters of recommendation, and other considerations relevant to the mission, vision, and values for the College of Pharmacy and Health Sciences (including service, advocacy, and leadership).

For students admitted to the Doctor of Pharmacy program through the 0-6 admissions pathway, a cumulative GPA of 3.10 following the first three semesters of the pre-professional curriculum is required to maintain seat assurance in the professional phase (years 3-6) of the curriculum. Qualified applicants will be invited to participate in an admissions interview and timed writing sample, both of which must be successfully passed by the student.

Individuals admitted to the Doctor of Pharmacy program through the 0-6 admissions pathway who do not attain a cumulative GPA of 3.10 following the first three semesters of the pre-professional curriculum may also progress into the professional phase (years 3-6) of the curriculum, but their progression is no longer assured and is subject to seat availability. For individuals seeking admission to the Doctor of Pharmacy program outside of the 0-6 admissions pathway, a GPA of 3.00 in the required prerequisite courses is preferred.

Individuals who are not admitted to the professional phase of the Doctor of Pharmacy program may pursue the Bachelor of Science in Pharmacy Studies degree (years 3-4), subject to seat availability.

#### **Combined PharmD/Masters Programs: PharmD/MBA and PharmD/MS in Organizational Leadership**

Candidates for the program are required to apply to both the MBA or the MS in Organizational Leadership through the College of Business and the PharmD program through the College of Pharmacy and Health Sciences.

#### **The Doctor of Occupational Therapy program**

See the Admissions Requirements (p. 358) in the Doctor of Occupational Therapy Program in the Occupational Therapy section of the catalogue.

The entry-level Doctor of Occupational Therapy program, will allow students to become practitioner scholars and transformative leaders. As professional leaders equipped with research evidence and global health policy perspectives, students will be broadly positioned to: impact populations with or without disabilities; advance community health outcomes; and influence the development of future occupational therapists as members of collaborative interprofessional practice teams in current healthcare settings and emerging practice areas such as telehealth remote therapy, assistive technologies, or research-based innovations developed by collaborative interprofessional practice teams.

#### **Master of Science in Pharmaceutical Sciences**

A 45-credit Master of Science in Pharmaceutical Sciences ("MSPS") degree is being offered by the Department of Pharmaceutical and Administrative Sciences in the College of Pharmacy and Health Sciences. This degree program can be completed in five full-time semesters (fall, spring, summer, fall, spring). Students can customize the focus area of their research degree through available elective courses and by the selection of a thesis advisor in a specific field of



medicinal chemistry, pharmacology, pharmaceuticals, immunology, neuroscience, pharmacogenomics, toxicology, oncology, biomedical engineering, or cosmeceutical sciences. The available research focus areas for the MSPS degree are: Pharmacological and Biomedical Sciences; Pharmaceuticals and Drug Delivery; Medicinal Chemistry and Drug Development; and Pharmacoeconomics and Healthcare Data Analytics. See the Admissions Requirements and Career Opportunities for this degree in the College of Pharmacy and Health Sciences Professional Programs section (p. 354) in this catalogue.

### Master of Science in Pharmacogenomics

A 41-credit Master of Science in Pharmacogenomics (“MSPGx”) degree is being offered by the Department of Pharmaceutical and Administrative Sciences in the College of Pharmacy and Health Sciences. This degree program can be completed in as few as three full-time semesters (fall, spring, summer). With an MSPGx degree from WNE, you will be ready to make the most of emerging opportunities, from basic or industrial research to clinical implementation through a well-rounded program that aligns with your personal career goals. See the Admissions Requirements and Career Opportunities for this degree in the College of Pharmacy and Health Sciences Professional Programs section (p. 356) in this catalogue.

### School of Law

**School of Law.** The School of Law offers full- and part-time JD programs designed to be completed in three and four years respectively. A total of 88 academic credits is required for graduation.

Additional information and an application form are available by contacting:

Admissions Office  
Western New England University School of Law  
1215 Wilbraham Road  
Springfield, MA 01119  
800-782-6665, or email: [admissions@law.wne.edu](mailto:admissions@law.wne.edu)

It also offers an LLM program in Estate Planning and Elder Law that can be completed in one year by a student attending full-time, or for part-time students, in two or three years. The programs are offered online. A total of 24 academic credits is required for graduation. Additional information and an application form are available by contacting:

LLM Admissions Office  
Western New England University School of Law  
1215 Wilbraham Road  
Springfield, MA 01119  
413-782-1426, or email: [calexander@law.wne.edu](mailto:calexander@law.wne.edu)

### How Graduate Admission Decisions Are Made

The admission decision is based on the applicant’s undergraduate academic performance in combination with other evidence, such as official test scores submitted as part of the application. Applicants judged by the graduate admissions committee to be deficient in verbal, quantitative, or general academic preparation may be granted permission to register at the discretion of the committee. These students are allowed to take up to two courses as a nondegree student.

Upon satisfying specified conditions, a student will be reconsidered for admission. Conditions may include, but are not limited to, satisfactory completion of prerequisite courses; demonstrated academic performance in graduate courses at Western New England University; and satisfactory completion of undergraduate English and/or mathematics courses.

### School of Law

Admission to the JD program in the School of Law is dependent upon an applicant’s performance on the Law School Admissions Test (LSAT), undergraduate grade point average, and other information that would assist the Admissions Committee in assessing the applicant’s ability to pursue a career in legal education. College courses that improve an applicant’s writing, analytical, and critical thinking skills are especially important.

### Combined JD/Masters Programs: Juris Doctor(JD)/MBA, JD/MS in Accounting or in Organizational Leadership

Candidates for this program are required to apply to both the MBA, MS in Accounting, or MS in Organizational Leadership program through the College of Business and the JD program through the School of Law.

### Combined PharmD/Masters Programs: PharmD/MBA and PharmD/MS in Organizational Leadership

Candidates for the program are required to apply to both the MBA or the MS in Organizational Leadership through the College of Business and the PharmD program through the College of Pharmacy and Health Sciences.

### Dual Master of Science (MS) in Engineering Management/MBA Degree

Candidates for this program are required to apply to both the MS in Engineering Management program through the College of Engineering and the MBA program through the College of Business.

### Graduate Program Status Categories

Applicants to graduate programs in Arts and Sciences, Business, and Engineering at Western New England University can be admitted in one of the following categories.

### Degree Status

Students who are admitted as fully qualified to undertake a program leading toward a degree are termed degree status students.

### Tentative Status

Students may be permitted to enroll in courses leading to a degree under tentative status before the application and evaluation process is complete. The tentative status is valid for a maximum of seven credits in the first term or two consecutive terms of no more than four credits each. Upon the conclusion of the tentative status period, the student’s application and academic record will be evaluated. The evaluation will result in termination, admission to degree status, or admission to nondegree status.

### Nondegree Status

Students who wish to take graduate courses outside of a degree program may be approved as nondegree status students. Nondegree status students do not require as much supporting documentation but are required to provide proof of a baccalaureate degree from an accredited college or university. They may take courses subject to space availability and an advisor’s approval. Continuing registration requires minimum grades of B (3.0) in all Western New England

University graduate courses. Nondegree students may apply a maximum of seven credits toward a degree if they complete the application process and are accepted as degree status students. Nondegree status students who take more than seven credits and complete the requirements for a certificate may apply for degree status and, upon their acceptance into a degree program, all courses common to both the certificate and the degree will be applied to the degree.

## Nondegree Status

### How to Register for Courses Taken in Nondegree Status

The University offers nondegree enrollment for students who wish to explore undergraduate or graduate study and earn credit before they are formally admitted to a degree program, and for visiting students from other institutions. Academic requirements may change over time so that courses completed in the nondegree status may not be applicable to the program chosen at the time of matriculation. Nondegree students are not eligible for most types of financial aid.

### Certificate Programs

Western New England University makes several Certificate Programs available to those who do not want a degree, but who want specialized training that goes beyond a few courses in a subject.

There are undergraduate certificate (p. 170) programs in chemistry (p. 170) and communication (p. 170).

There are graduate certificate programs in engineering (p. 363) and leadership (p. 362).

Information is available through the Admissions Office.

### Undergraduate Nondegree Study

Permission to register requires proof of high school graduation or its equivalent. Continuing registration normally requires a cumulative grade point average of C (2.0) in courses taken at the University. Nondegree students must satisfy published course prerequisites and may be required to submit official transcripts as proof of appropriate preparation. Advising of nondegree students is provided through the colleges.

### Graduate Nondegree Study

Please refer to Nondegree Status (p. 17).

## UNDERGRADUATE ACADEMIC INFORMATION

### Undergraduate Policies, Procedures, and Requirements for Degrees

#### Basic Structure of the Undergraduate Degree

At Western New England University, students typically enroll in programs designed to be completed in four academic years. Bachelor's degrees are earned by completing at least 120 credit hours in a structured program, though undergraduate degrees in engineering and certain other degree programs can require up to 129 credit hours.

#### Course Loads

The University considers 12-18 credit hours per semester to constitute a normal course load for full-time students.

Students who have earned Dean's List standing in the previous semester may enroll for 19 credit hours without special permission. In other cases, each request for enrollment for 19 or more credit hours per semester requires the recommendation of the student's advisor and approval by the Dean of the academic college in which the student is enrolled.

First year students require the approval of the Dean of First Year Students & Students in Transition.

#### Abbreviated Term Enrollments

Students may enroll for up to three credits in the 3-week winter term and up to nine credits in the 15-week summer term structure. These limits apply to credits earned through Western New England University and transfer credits earned at another college or university. Deans may grant an exception to exceed the established credit limit, based on their review of whether the student will be in compliance with the credit hour policy.

#### Online Course Load

##### **THROUGH THE WINTER SESSION 2023:**

All limitations on students taking online courses are relaxed for the summer session 2022, fall semester 2022, and winter session 2023. Students, including first-year students, may take a mix of online and on the ground courses as they and their advisors see fit.

##### **IN EFFECT FOR THE SPRING 2023 SEMESTER:**

In order to experience a wide range of pedagogy, undergraduate students at Western New England University may take online courses with the following guidelines.

Full-time sophomores and juniors are allowed to register for no more than one online course per semester of the regular academic year.

Full-time seniors and Veterans may take up to two online courses per semester, however an individual College may choose to be more restrictive and undertake an internal review of each request.

Online courses can only be taken after the freshman year.

There is no restriction to the number of online courses/credits a full-time student can apply toward a degree provided the courses are equivalent to Western New England University courses.

Exceptions are at the discretion of the Provost after consultation with student's faculty advisor, the department chairperson of the student's major, and/or the Dean of the College of the student's major.

#### Credit Hours System

Credit in all programs is awarded in accordance with regional accreditation standards based upon federal regulations.

One academic credit is equal to approximately three hours of student learning time per week and corresponds to 45 hours of work, inside and outside of class, over the semester. For a typical three credit course, three hours are earned for classroom instruction (typically three 50-minute sessions, or two 75 minute sessions, or--in the case of some evening courses--one 160 minute session) and six hours earned for individual study done outside of class each week.

In the usual 120-credit hour degree program students complete ten three-credit-hour courses per year.

#### Policy on the Credit Hour

WNE adheres to the definition of a credit hour established by the New England Commission on Higher Education (NECHE) (effective in 2011 and updated in 2021). A credit hour is

an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is consistent with commonly accepted practice in postsecondary education and that reasonably approximates not less than

(1) One hour of classroom or direct faculty instruction and a minimum of two hours of out of class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or ten to twelve weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time; or

(2) At least an equivalent amount of work as required in paragraph (1) of this definition for other academic activities as established by the institution including laboratory work, internships, practica, studio work, and other academic work leading to the award of credit hours.

For a standard 15-week semester at WNE, one credit hour approximates 2100 minutes over 14 weeks: approximately 700 minutes of in-class or direct faculty instruction delivered in meetings of at least 50 minutes plus a minimum of 1,400 minutes of out-of-class student work. The fifteenth week is reserved for exams. At least an equivalent amount of work is required for credits earned in courses that meet outside the standard 15-week semester.

#### Class Standing Designations

Students are designated as either freshman, sophomore, junior, or senior in accordance with the number of credit hours they have completed at the University in a structured degree program.

**Freshman:** 29 credit hours or fewer

**Sophomore:** 30-59 credit hours completed

**Junior:** 60-89 credit hours completed

**Senior:** 90 credit hours or more completed

#### *Relationship of Course Designation Numbers to Stages in Curricula*

All courses in the catalogue have course designation numbers. In general, the numbers designate the level of the course offering within a four-year curriculum and within a major program of study.

Freshman courses are numbered:

100 to 199 Lower Division

Sophomore courses are numbered:

200 to 299 Lower Division

Junior and Senior courses are numbered:

300 to 499 Upper Division

Major programs of study typically consist of one or two 100-level courses and two or three 200-level courses taken as prerequisites in the freshman and sophomore years, and the remaining 300- and 400-level courses taken in the junior and senior years.

#### *Components of a Typical Undergraduate Degree*

Undergraduate students must follow the degree requirements outlined in the catalogue in effect when they enroll at Western New England University. In the event of changes to degree requirements in their curriculum or the creation of a new academic program, students may select a subsequent catalogue and must follow the requirements of that catalogue. Students readmitted to the University after an absence of at least one year will follow the degree requirements outlined by the catalogue in effect at the time of re-enrollment.

The courses required for a degree differ with the choice of major program and the College within which that program is offered. All students are subject to three classifications of course requirements:

1. General University requirements
2. College requirements designed to broaden and deepen students' knowledge of disciplines outside of their majors
3. The requirements of a major

#### *Qualifications for a Baccalaureate Degree*

In order to qualify for a baccalaureate degree a student must:

1. Comply with the entrance requirements for normal matriculation.
2. Meet the attendance requirement.
3. Receive passing grades in all courses required for the degree.
4. Attain a minimum grade point average of 2.0 for the entire curriculum. (Transfer students must maintain a 2.0 average in courses taken at the University. Transfer hours are not included in determining the Western New England University grade point average.)
5. Attain a minimum grade point average of 2.0 in the major.
6. Complete at least 30 credit hours at Western New England University.

7. Complete at least 24 of the last 30 credit hours used in satisfaction of the degree requirements with courses offered by programs of Western New England University.
8. Complete an Application for Degree form, which will place the student's name on the list for October, February, May, or August degree conferral, as appropriate.

#### *Qualifications for a Second Baccalaureate Degree*

In order to qualify for a second baccalaureate degree, a student must:

1. Complete thirty (30) additional hours
2. Meet the new requirements for the second degree
3. Allow a year to lapse between the awarding of the first degree and the second degree

When a student wishes to return for a second degree:

1. Student may return to the same College by simply requesting the same from Academic Dean
2. Student may transfer to a different College by using the Change of Major form. In this instance, the previous Dean will indicate the degree already earned.
3. Academic honors for the first degree will be based on the first 120 hours completed, or will be determined at the end of that semester in which the student completes 120 hours and fulfills the requirements for graduation.
4. Student may not earn academic honors for a second degree.

#### *Award of Degrees Policy*

The University does not guarantee the award of a degree or a certificate of satisfactory completion of any course of study or training program to students enrolled in any instructional or training program. The award of degrees and certificates of satisfactory completion is conditioned upon satisfaction of all current degree and instructional requirements at the time of such award, compliance with all University policies and regulations, as well as meeting bona fide expectations of the faculty.

#### *POLICY on the POSTHUMOUS CONFERRAL OF DEGREES*

This policy establishes the criteria for Western New England University to recognize the academic achievements of students enrolled at the time of their death. A degree awarded posthumously acknowledges the completion of a significant part of the academic degree requirements and recognizes the student's good standing with the university.

#### *Requirements for Awarding Posthumous Degrees*

Western New England University will consider the posthumous awarding of a degree in the program that the student was pursuing at the time of death, provided that the deceased student completed at least 75% of credit hour requirements, with at least 30 credits taken at WNE.

#### *Process and further criteria*

1. A request for the awarding of a posthumous degree may be initiated by the deceased student's family, or by the student's advisor, program chair, or academic dean.

The request is made to the Provost.

2. The Registrar will review the student's record to determine whether the student has met the following criteria:
  - in good academic standing.
  - in good disciplinary and social standing, as determined by the Office of Student Affairs.
  - the student has the endorsement of the school/college Dean.
3. The Provost shall have final approval of the awarding of a posthumous degree once the above criteria have been confirmed by the Registrar.
4. Upon approval by the Provost, the Provost will notify the Registrar, who shall coordinate with the Vice President of Student Affairs to make any arrangements with the student's family. If the family wishes, the appropriate degree will be awarded at the Commencement at which the student would have been otherwise recognized or at a similar ceremony acceptable to the University and the student's family. The student's family will be asked to identify an appropriate person to receive the diploma when the student is recognized at the appropriate time in the Commencement ceremony. Except for the fact that the individual receiving the diploma on behalf of the student shall not be attired in cap or gown, there shall be no other changes in the ceremony.
5. Existing balances in the student's account shall be forgiven.
6. The student's name in the commencement program shall be listed, parenthetically noted as "Posthumous". The diploma and transcript will say, "Awarded Posthumously."

### *Academic Advising and Student Responsibilities*

Academic advising at Western New England University is framed against the University Mission Statement and is guided by a commitment to student academic progress and personal growth. Specifically, advising is intended to enhance and support student learning in an atmosphere of personal concern. Advising seeks to engage intellectual growth and self-discovery, and is carried out through a consistent exchange between student and advisor. That shared relationship thereby attempts to prompt students to develop decision making skills, set realistic expectations, and practice the necessary coping strategies to attain their educational, life, and career goals.

Each full-time student is assigned a faculty advisor. In the freshman year of full-time study, the academic advisor is normally assigned on the basis of enrollment in First Year Seminar. After the sophomore year and beyond, students are normally assigned or may choose an advisor according to the academic department in which the student's major is contained. Students who are undecided remain with their current advisor or are assigned to the Academic Success Center (Campus Center Room 137, or 413-796-2027) until a major is declared. Academic advising is provided for part-time students through the appropriate college. Although the advisor should be consulted on matters of curriculum, the ultimate responsibility for decision on the student's program of study remains with the student.

Furthermore, each student holds the ultimate responsibility to understand degree requirements and to plan for orderly fulfillment.

It is important that students work with their academic advisors to develop an academic plan enabling them to complete many of the fundamental General University Requirements by the end of the sophomore, or second, full year of study. While this may not always be possible due to schedule limitations of certain programs or other schedule anomalies, students should strive to acquire the prerequisite skills and knowledge necessary to succeed in their major programs. For example, students will need to have skills in research and writing in order to understand and complete assignments in upper division courses in and outside of their major fields of study. Students should also consult their advisor to choose elective courses that both broaden and deepen their knowledge of disciplines that are important for success and well being beyond the University experience.

### *Degree Audit*

An automated degree requirement system, known as a Degree Audit, assists students and advisors in assessing the progress of a student's program of study. It enables students and advisors to project the orderly fulfillment of their curriculum plan. It includes a record of all the student's courses completed to date and their courses in progress, and serves as an unofficial projection of courses remaining in a degree program.

A Degree Audit can also be used to determine the progress status of degree programs other than the currently declared major. In other words, if a Marketing major wants to determine the viability of becoming a Management major, a trial Degree Audit can be retrieved and populated with all courses taken to date by a student, along with the remaining degree requirements.

While a Degree Audit is a useful tool for planning the orderly fulfillment of degree requirements, students and advisors must realize it is not a replacement for the official academic transcript, nor should it be used as a substitute for verifying official degree requirements. The University catalogue that the student has matriculated under is the primary source.

### *Policies and Procedures*

#### *Student Contact Data*

Students are obliged to provide and maintain basic contact data such as permanent and local address, local telephone or cell phone, and an active email account if the account is other than the email provided by the University. This information shall be updated as necessary but must be provided prior to course registration each semester.

#### *Student Schedules, Registration, and Adding or Dropping Courses*

In order to register for classes, the student typically meets with a faculty advisor to discuss the student's selection of courses. Consultation with a faculty advisor is required to initiate the course registration process. If the advisor is not available, students may seek consultation with the corresponding Assistant Dean. First year students may also consult with the Office of First Year Students & Students in Transition.

Once registration has been completed, students are expected to consult with the advisor (or Dean's Office if advisor is not available) before any additions, deletions, or changes can be made in the student's schedule. All changes must be reviewed by the advisor or Dean. Changes also need to comply with established deadlines to add and/or drop a course. Instructor approval must also be obtained to add a class after it has met for the equivalent of one week.

For any change of schedule to be valid (after the first week of classes), including course withdrawals, the student must submit a schedule change form to Enrollment Services. Absence from class or notifying the instructor without completing the drop form does not constitute withdrawal from a course.

### *English and Mathematics Assessment*

To encourage student success, assessment in both English and Mathematics is required for all first-year and transfer students prior to completion of course registration. Appropriate directives are then provided for course selection and registration, awarding of transfer credit and/or additional support services. Students not eligible for direct entry into courses required for some degree programs may have to take additional credits to fulfill graduation requirements.

### *Course Offerings*

Western New England University attempts to offer the widest possible selection of courses each year, but the University reserves the right to withdraw, modify, or add to the courses offered, or to change the order of courses in curricula as circumstances warrant.

The University further reserves the right to cancel under-enrolled courses. Students affected by such cancellations will be permitted to choose another course. In cases where other courses cannot be substituted, students may be permitted to waive requirements or receive full or partial refunds of tuition and other fees. The University also reserves the right to change the requirements for graduation, the tuition, and the fees charged as circumstances dictate and needs arise.

### *Modifying a Student's Major Degree Program*

Any modification or change to a student's major degree program requires the written permission of the student's academic Dean. The waiver/substitution form may be obtained in the student's academic Dean's office.

Concurrent registration in more than one academic program leading to separate degrees is not allowed without the written permission of the appropriate academic Dean. Permissions forms may be obtained in the student's academic Dean's office.

### *Change of Student's Curriculum/Major*

Changing a student's degree program/curriculum/major within the same college or changing a student's curriculum/major to a different college, requires the completion of a "Change of Major." The form is available online or in the student's academic Dean's office.

Selection of a new, or additional major (2nd major) and/or a minor, may change projected graduation date. Although the academic advisor should be consulted on matters of curriculum, the ultimate responsibility for decisions on the student's program of study remains with the student. Furthermore, each student holds the ultimate responsibility to understand degree requirements and to plan for orderly fulfillment.

Changing a degree program may result in assignment to the catalogue requirements in effect at the time of the change.

### *Taking Coursework at Another College*

Coursework towards a student's degree program may be pursued elsewhere only with the prior written permission of the student's academic Dean. Permission forms are available in the student's academic Dean's office. An official copy of the transcript needs to be sent to Enrollment Services upon completion of the prior approved coursework.

### *Integrity of Scholarship*

Honesty in all academic work is expected of every student. This means giving one's own answers in any and all coursework, including but not limited to homework, quizzes, and examinations without help from any source not approved by the instructor. Written material is to be the student's original composition. Appropriate credit must be given for outside sources from which ideas, language, or quotations are derived.

Additional information on academic dishonesty may be found in the Student Handbook.

### *Attendance*

Students are expected to attend all class sessions for courses in which they are enrolled. However, it is the responsibility of the individual instructor to evaluate the importance of attendance in determination of course grades.

Accordingly, at the beginning of each semester, each instructor prepares a written statement setting forth the policy for consideration of absences, makeup examinations, and related matters that will be in effect for that entire semester. The statement of policy on attendance, appropriate to each class, is made available at the first class meeting.

It is especially important for freshman students to establish the discipline of attending all classes and laboratories and to be properly prepared by having done all assigned reading and homework. It can be easily demonstrated that students who fail to attend class do not succeed in college.

Student Absence Due to Religious Beliefs (p. 454)

### *Midyear and Final Examinations*

Midyear examinations are given at the discretion of the faculty member teaching the course. The normal pattern is that final examinations are given in all courses in accordance with a schedule published by the Academic Scheduling Office. In case an instructor decides not to give a final examination, the instructor must inform the college's Dean.

Final examinations must be given on the date and at the time scheduled by the Academic Scheduling Office unless other arrangements have been approved by the college's Dean and forwarded to the Academic Scheduling Office. Under no circumstances are final examinations to be administered during the final week of classes. Further, during the last week of classes, hour examinations are permitted only in those courses where there is a final examination, semester paper, or semester project requirement due the week of final examinations. The chair of each department is responsible for the adherence of the latter policy by all members of the department. In addition, no examinations or quizzes shall be administered the last day of classes (if it falls on Monday) or on the last two scheduled days of classes (if the last day of classes falls on Tuesday or thereafter). This policy does not in any way relieve the student of responsibility for material covered in the last days of classes.

The faculty member in each course in which students are enrolled determines the value and weight of a final examination. All final examinations are given at the end of the semester according to a predetermined schedule. The anticipated final exam schedule is normally published at the beginning of each semester. Students should note the exam schedule when arranging travel plans for departure at the end of the semester.

When preparing the final exam schedule, every attempt is made to avoid scheduling more than two exams for each student in any given day. Should this situation occur, however, the Faculty Senate has adopted a policy to assist students in managing the conflict. In the case of a student who is scheduled for three final examinations on one day, the examination in the middle time is expected to be rescheduled at the convenience of both the student and the faculty member. The student must give notice to the faculty member of the middle exam no later than 10 days prior to the start of the examination period for that semester.

There are two exceptions, however, to the middle exam solution. The first is that if the student can move any of the three examinations to the examination for another section of the same course taught by the same instructor, he or she must make that request of the faculty member if the move does not cause another conflict. The second exception is that if the middle examination is a common examination (multiple sections of the course all taking the same exam), one of the other two remaining exams will be rescheduled by joint agreement between the two faculty members. The student should make the conflict known to both faculty involved. If an agreement cannot be reached, a decision will be jointly made by the Deans of the Colleges in which these two courses are housed.

The final exam schedule is posted on the Academic Scheduling Office's website, <https://www1.wne.edu/academic-affairs/academic-scheduling.cfm>

### *Undergraduate Grading System*

The work of each undergraduate student is graded according to the following scale.

Figures indicate undergraduate grade point equivalents:

Superior	A (4.0)	A- (3.7)	
Above Average	B+ (3.3)	B (3.0)	B- (2.7)
Average	C+ (2.3)	C (2.0)	C- (1.7)
Passing	D+ (1.3)	D (1.0)	P (0)
Failure	F (0)		

In certain undergraduate courses (SW 314, SW 409, SW 410, SW 411, and SW 412), a grade of "P" (Pass) is assigned if the course is satisfactorily completed. "P" has no grade point equivalent.

### *Repeating a Course*

Any course in which a grade of less than "C" was received may be repeated a maximum two times for a total of three attempts at any time during the student's enrollment at Western New England University. Grades of F and W count as attempts. The official transcript shows the complete record, but the grade point average is computed on the basis of the most recent earned grade in each course (W is not an earned grade). Credit for the course is awarded only once. This policy is noted when a transcript is sent out. In cases where a course grade of "F" has been assigned as a penalty for gross academic dishonesty, a student may not replace that grade in the cumulative GPA. The student may retake the course, but the resulting grade is counted as a separate course.

### *Incomplete Work*

The mark "I" is appropriate for a student who is unable to complete work for a course by the end of the semester in cases of extenuating

circumstances. Incompletes may not be granted based solely on a request for more time or to submit additional/revised work to earn a higher grade. Extenuating circumstances include serious documented illness or incapacitation, family emergency, or death in the family. The Dean of Students can assist in validating documentation for family emergencies or medical situations.

The student has six weeks from the last day of final examinations to submit work, whether or not they are still enrolled at Western New England University. Since finals typically end on Fridays, that gives faculty the weekend to review and grade the work. Faculty have until Noon the following Monday to submit the grade. Please see the Academic Calendar for exact deadlines for each term.

The mark "I" becomes an F grade for work not completed after six weeks or by the conclusion of an approved extension period. An incomplete not so made up will be changed to the grade F automatically unless an extension request is submitted by the faculty member and is approved by the University Registrar, in consultation with the appropriate Dean's office, before the original student deadline to submit work. In no event will any extension go beyond the last day of exams of the following fall or spring semester.

Students may not register if they have four or more Incompletes on their record. The mark "I" carries a grade point equivalent of 0.000 for purposes of determining Academic Standing and Satisfactory Academic Progress. If the mark "I" is given in the last semester of enrollment, the incomplete must be changed to a letter grade before the degree will be awarded.

### *Withdrawal from a Course*

To withdraw from a course, the student must obtain their advisor's or the Dean's signature on the course withdrawal form available from Enrollment Services. Absence from class without completing the form does not constitute withdrawal and may result in a failing grade. (See section on Withdrawals and Refunds (p. 436) regarding payments.)

W (Withdraw)—If the student withdraws from a course within the first two weeks, no grade is assigned. If a student withdraws after the second week of classes, but prior to the last withdrawal date published in the final schedule for that semester, a "W" is assigned. However, a student may not receive a grade of "W" to avoid the consequences of a breach of academic integrity. A grade of "W" carries no academic penalty or prejudice.

### *Medical Leave*

A matriculated undergraduate who needs to discontinue studies during the course of a semester for medical reasons (physical and/or mental health) can request a mid-semester Medical Leave.

Students who are having medical difficulty are encouraged to contact the Dean of Students office to discuss the details of the medical leave request and to explore options to support the student's long-term success. The Dean of Students office will confer with the Academic Success Center and other University offices as needed on issues affecting the student and their studies.

A mid-semester Medical Leave does not negate the student's financial responsibility to the University. Tuition, fees, room and board charges, and financial aid will all be treated normally through the WNE Withdrawal and Refund Policy, related refund schedules, and federal Return of Title IV Funds guidelines. Financial aid recipients should contact Enrollment Services as soon as possible to explore all implications of taking a Medical Leave related to their student account and financial aid. Students are also encouraged to

look into possible implications for their health insurance coverage.

Mid-semester Medical Leaves are formally initiated by the student submitting a Medical Leave Request Form and supporting documentation from a health care provider to the Dean of Students office. The Dean of Students office will consult with University Health and Counseling Services as appropriate. The Dean will submit approved Medical Leave Request forms to Enrollment Services.

To be eligible for a mid-semester Medical Leave, the student must have demonstrated academic engagement up to the point that extenuating circumstances affected the student's performance. The date the student submits the mid-semester Medical Leave form and supporting documentation, or otherwise notifies the University in writing of the need for a mid-semester Medical Leave, is the effective date of the leave. No academic work or participation may happen after this date; doing so moves the effective date of the Medical Leave to the date of the last academically-related activity except as noted below. Medical Leaves with effective dates after the course drop deadline will result in grades of W for all registered course work. Requests must be submitted by December 1 for the fall semester, May 1 for the spring semester or July 1 for 8-week or 12-week summer semesters, except that Medical Leaves cannot be approved if a student has taken a final exam or submitted final coursework for any classes for the semester. Medical Leaves are not available for winter or 6-week summer semesters.

The Dean of Students Office, in consultation with University Health and Counseling Services staff, may include treatment expectations upon their request to return for students granted a Medical Leave. Students receiving a mid-semester Medical Leave typically must be away from the University for the semester the leave takes effect and one additional full 15-week semester. Exceptions regarding the additional full semester off will only be considered on appeal in cases where the student provides sufficient documentation attesting to the student's readiness to resume academic work.

Students must request to return from Medical Leave to the Dean of Students, and the request must include supporting documentation from a licensed health care provider who is not related to the student and who is responsible for treatment that supports the student's request for—and reinstatement from—the leave.

Students on Medical Leave are considered to be current Western New England University students, but may not be enrolled in classes during their time away. The Western New England University email address will remain active and will be the primary means of contact by the University.

### *Withdrawal from the University*

If it becomes necessary for undergraduate degree students to withdraw or request a leave of absence from the University, an Application for Withdrawal or Absence from Campus form must be completed and filed with the Academic Success Center. (Please note that mid-semester Medical Leave requests will be submitted to the Dean of Students office using the Medical Leave Request form. See section on Medical Leave (p. 22)). Prior to completing the Application for Withdrawal or Absence from Campus form, students are expected to consult with the Dean of First Year Students & Students in Transition in order to complete a formal exit interview. Withdrawal and leave requests will be made part of the student's permanent record maintained in Enrollment Services.

When extenuating circumstances prevent a student from filing the form in person, an application for withdrawal by email is acceptable.

The email should state the reasons necessitating the withdrawal and should be directed to the Dean of First Year Students. In the case of graduate and professional students, withdrawal forms are filed with the Law School Registrar or the academic Dean's office of the college in which the student's major is administered.

The effective date of an official withdrawal is the date the student submits written notification of the intent to withdraw to the University's designated offices as described in this policy. If a student leaves the University without providing official notification, the withdrawal date is the midpoint of the payment period or period of enrollment, as applicable, or the date of an academically-related activity in which the student participated. Academically-related activities include physically attending a class where there is an opportunity for direct interaction between the instructor and students; submitting an academic assignment; taking an exam, an interactive tutorial, or computer-assisted instruction; attending a study group that is assigned by the University; participating in an online discussion about academic matters; and initiating contact with a faculty member to ask a question about the academic subject studied in the course.

Any approved refunds will be computed on the basis of the effective date described above. Absence from class without completing a withdrawal form does not constitute withdrawal, and submission of course drop forms may not substitute for a withdrawal. Refunds are made in accordance with the Tuition Refund Schedule and the Room and Board Refund Schedule. Students who withdraw with an unpaid balance will be financially liable for any amount remaining unpaid after a refund credit, if any, has been applied to the balance. Students who withdraw from the University will have transcripts withheld until all financial obligations have been met.

Any refund resulting from a reduction in the number of hours registered will be made on the basis of the above schedule. Students taking between 12 and 18 hours per term will not have any adjustment in tuition if, after the course reduction, they are still enrolled in 12 to 18 credit hours. The Higher Education Amendments of 1998 require students receiving Federal Title IV financial assistance who withdraw or otherwise cease attendance on or before 60 percent of the way through the semester to have their assistance reduced based on calendar days enrolled versus the length of the semester. Programs affected are Pell Grants, Supplemental Education Opportunity Grants, Federal Direct Ford Subsidized Loans, Federal Direct Ford Unsubsidized Loans, and Federal Direct Ford Plus Loans, but not Federal Work-Study. The calculation of the amount to be returned to these funds may result in the student owing a balance to the University and/or the Federal Government. Institutional scholarships and grants will be adjusted according to the same percentage as tuition charges. State Aid will be adjusted according to the same percentage as the federal aid.

(See the section on Procedure for Withdrawing (p. 436).)

### *President's List and Dean's List*

To be placed on the President's List, a full-time student must be enrolled in courses carrying a minimum of 12 credit hours and achieve a semester grade point average of 3.80 or above.

A part-time student may qualify for the President's List by carrying 6-11 credit hours and achieving a grade point average of 3.80 or above.

To be placed on the Dean's List, a full-time student must be enrolled in courses carrying a minimum of 12 credit hours and achieve a semester grade point average of 3.30 or above.

A part-time student may qualify for the Dean's List by carrying 6-11 credit hours and achieving a grade point average of 3.30 or above.



### *Honors*

Honors are awarded at graduation for superior scholastic attainment. Students are recommended for honors if, in addition to satisfying all other requirements for the degree, they have completed a minimum of 60 credit hours at the University and have earned the required grade point average:

Cum Laude requires a grade point average of at least 3.30

Magna Cum Laude requires a grade point average of at least 3.60

Summa Cum Laude requires a grade point average of at least 3.80

Students who graduate with between 45 and 59 credit hours completed at the University and who have a grade point average in those courses of 3.50 or higher graduate "With Honors".

### *Academic Standing*

Students' academic standing is determined by their cumulative grade point averages (GPA). Academic Standing is normally calculated for fall and spring semesters. Academic Suspension, Academic Dismissal, and Immediate Reinstatement will be permanently recorded on students' official transcripts. An Academic Warning will not appear on the official transcript. However, all Academic Warnings, Academic Probations, as well as all Academic Suspensions, Academic Dismissals, and Immediate Reinstatements will be permanently recorded on internal academic records.

#### **Good Standing.**

Students are in good academic standing when their cumulative GPA is 2.000 or above. This requirement applies to full-time and part-time students and to those who were admitted as first-year, transfer, or non-matriculated students. The average number of credits earned per semester is not used in the determination of academic standing. However, the Registrar's Office will issue a credit alert to all students who have earned less than an average of 12 graduation credits per semester.

#### **Academic Warning.**

Academic Warning is an indicator to students that they are in academic difficulty. Students whose cumulative GPA is 2.000 or above, but whose Semester GPA falls below 2.000, will be sent a warning indicating that they must meet with the Academic Success Center prior to the end of the first week of classes of the next fall or spring semester to enter into a written agreement defining an academic improvement plan. Seniors whose cumulative GPA is 2.000 or above, but whose major GPA is less than 2.000, will also be placed on Academic Warning since they will need to earn a Major GPA of 2.000 to graduate. This status does not appear on the transcript and is not subject to appeal.

#### **Academic Probation.**

Academic Probation is a formal standing that shows the student is in academic distress. Students whose cumulative GPA falls below 2.000 will be placed on Academic Probation. Once placed on probation, a student must meet with the Academic Success Center prior to the end of the first week of classes of the next fall or spring semester to enter into a written agreement defining an academic improvement plan. This standing appears on the transcript and is not subject to appeal.

#### **Academic Suspension.**

Academic Suspension is a separation from the University of a full semester (fall or spring). Students who have been on Academic Probation and who fail to achieve or maintain Good Standing in any subsequent semester will be placed on Academic Suspension. Suspended students may not enroll in the succeeding fall or spring semester (see section on Appeals Process below). Following one

semester on Academic Suspension, students who submit a Request for Reactivation (see Reactivation Procedure (p. 11) section) that is approved by the University Registrar before February 15 for the Fall semester or September 15 for the Spring semester are entitled to participate in Priority Registration. Upon reactivation, students returning from suspension shall confer with their academic Deans prior to re-enrollment. This standing appears on the transcript and is eligible for appeal.

Students who are placed on Academic Suspension may be granted an Immediate Reinstatement through the appeal process (see Appeals Process below). Immediate Reinstatement status allows the student to return on Academic Probation and grants the student an additional semester to achieve Good Standing. Students on Immediate Reinstatement status who fail to achieve Good Standing will be dismissed.

#### **Academic Dismissal.**

Academic Dismissal is a permanent separation from the University. Students who were previously placed on Academic Suspension (including those granted an appeal and Immediate Reinstatement) who are readmitted and fail to achieve or maintain Good Standing in any subsequent semester will be placed on Academic Dismissal unless an appeal is granted (see Appeals Process below). This standing appears on the transcript and is eligible for appeal.

#### **Summer and Winter Course Enrollments for Suspended and Dismissed Students.**

Although academic standing is determined on the basis of prior coursework, due to the timing of registration and academic discipline matters students placed on Academic Suspension or Academic Dismissal may complete a course for which they registered before suspension or dismissal occurred if it is offered during the immediately subsequent Winter or Summer Session (Summer I, Summer III, or Summer IV only).

However, such a course would not be considered as supporting evidence in an appeal of a suspension or dismissal unless both of the following are true: first, a passing grade in the course would allow a student to reach a cumulative grade point average of 2.000 or higher (Good Standing); and second, the course has been identified by the academic Dean as an appropriate choice toward achieving academic progress (e.g. coursework that satisfies general education or major requirements).

#### **Appeals Process.**

Students have the right to appeal Academic Suspension or Academic Dismissal. Authority for determining students' academic status resides with the Academic Standards Committee.

1. Students must consult with their Dean's office about petitions and appeals procedures. Students may also consult with the Academic Success Center. All appeals must be submitted in writing on the Academic Appeal Form to the University Registrar by the deadline stated in the notice of Academic Suspension or Academic Dismissal.
2. Appeals of Academic Suspension or Academic Dismissal may be made on the following grounds: substantial academic progress; course work completed after the initial decision; financial difficulties; health problems; extenuating personal circumstances; other academic reasons.

Appeals of the Academic Standards Committee ordinarily are final. A student may appeal the decision of the Academic Standards Committee by submitting a written appeal to the Provost within five (5) business days of receipt of the Academic Standards Committee's official decision on the following grounds: incorrect calculation of

grade point average; fair consideration was not provided to the student, i.e., there is evidence that some aspect of the appeal consideration was prejudicial, arbitrary, or capricious; or new and significant information, not reasonably available at the time of the initial appeal, has become available.

#### **Academic Status and Grade Changes.**

The academic status earned by a student shall remain in effect if they receive a retroactive grade change that affects Academic Standing, unless the original grade is corrected by the professor, or an Incomplete is converted to a grade, within 6 weeks.

## Special Academic Opportunities

### Accelerated Five-Year and Six-Year Business and Engineering Programs

#### *Five-Year Bachelor/MBA Program*

This program (p. 108) allows undergraduate students in the Colleges of Arts and Sciences, Business, and Engineering to accelerate the completion of the bachelor's degree and to earn the popular and valuable Master of Business Administration (MBA) degree with just one additional year of study.\*

\*Available to all majors except for Education. Engineering majors may be admitted to the program prior to the end of their first year.

#### *Five-Year Bachelor/Master of Science in Accounting Program*

This program (p. 108) allows undergraduate Accounting majors in the College of Business to accelerate the completion of both the bachelor's and master's degrees in Accounting. Students can earn the Master of Science (MS) in Accounting degree with just one additional year of study.

#### *Five-Year Bachelor/MSE in Electrical Engineering Program*

This program allows undergraduate Electrical Engineering majors in the College of Engineering to accelerate the completion of the Bachelor of Science in Engineering (BSE) with a major in Electrical Engineering (BSE) and to earn the Master of Science in Engineering (MSE) in Electrical Engineering with just one additional year of study.

#### *Five-Year Bachelor/MS in Engineering Management Program*

This program allows undergraduate Engineering majors in the College of Engineering to accelerate the completion of the Bachelor of Science in Engineering (BSE) degree and to earn the Master of Science (MS) degree in Engineering Management with just one additional year of study.

#### *Five-Year Bachelor/MSE in Mechanical Engineering Program*

This program allows undergraduate Mechanical Engineering majors in the College of Engineering to accelerate the completion of the Bachelor of Science in Engineering (BSE) with a major in Mechanical Engineering and to earn a Master of Science in Engineering (MSE) degree in Mechanical Engineering with just one additional year of study.

#### *Accelerated Five-year BS Biomedical Engineering and MS Pharmaceutical Sciences*

The College of Engineering and the College of Pharmacy & Health Sciences have collaborated to offer a program unique to western Massachusetts for those students interested in attaining a Bachelor's of Science in Engineering (BSE)—Biomedical Engineering and

furthering their career aspirations with a thesis-based Masters of Science in Pharmaceutical Sciences (MSPS). This is a dual degree program, where students completing the requirements for each program will receive two separate degrees, with just one additional year of study beyond the normal four-year bachelor's program.

#### *Accelerated Six-Year Engineering/Law Program*

The College of Engineering's accelerated six-year BSE/JD program offers qualified engineering students the opportunity to complete both their Bachelor of Science in Engineering (BSE) in their major area of study and their JD degree at the University in six years instead of seven. To be tentatively accepted into this unique program in the freshman year, students need a minimum SAT Math score of 650 and a minimum Critical Reading SAT score of 650; or ACT equivalent scores of 29 in English, Math, and Composite; and a high school GPA of 3.5 or higher. Students not meeting these precollege requirements, but who have demonstrated superior performance in their studies at the University, may petition to be considered for the accelerated degree sequence at the end of their sophomore year.

Students need to maintain a 3.3 undergraduate GPA in order to maintain their tentative acceptance to the School of Law. Following the sophomore year, students take the LSAT and need to score above the 50th percentile of the previous year's matriculating Law School class. During the fourth year, students will be completing their BS degree and begin taking classes at the School of Law. These law classes are offered in the evening so there is no conflict with the engineering courses. The summer following senior year is spent completing the requirements of the first year of law school and puts the student on track to complete the law degree in just two additional years. These final two years of the program follow the standard School of Law timetable.

#### *Accelerated Six-year Biomedical Engineering/Law Program*

Qualified Biomedical Engineering students have the opportunity to accelerate their attainment of a BSE in Biomedical Engineering and a Law degree. Entrance requirements and standards necessary to maintain a tentative acceptance to the School of Law can be found in the "Six-year Engineering/Law Program" section of this catalogue.

Students choosing this unique curricular path will need to closely follow a prescribed sequence of courses and should consult closely with their advisor. The first two years of study will remain the same as the BSE curriculum. The third year will change slightly to accommodate the senior year when the student will take both Engineering and School of Law courses. Some summer School of Law courses will be necessary after the fourth year.

#### *Accelerated Six-Year Civil Engineering/Law Program*

Qualified Civil Engineering students have the opportunity to accelerate their attainment of a BSE in Civil Engineering and a Law degree. Entrance requirements and standards necessary to maintain a tentative acceptance to the School of Law can be found in the "Six-year Engineering/Law Program" section of this catalogue.

Students choosing this unique curricular path will need to closely follow a prescribed sequence of courses and should consult closely with their advisor. The first two years of study will remain the same as the BSE curriculum. The third year will change slightly to accommodate the senior year when the student will take both

Engineering and School of Law courses. Some summer School of Law courses will be necessary after the fourth year.

#### Accelerated Six-Year Computer Engineering/Law Program

Qualified Computer Engineering students have the opportunity to accelerate their attainment of a BSE in Computer Engineering and a Law degree. Entrance requirements and standards necessary to maintain a tentative acceptance to the School of Law can be found in the “Six-year Engineering/Law Program” section of this catalogue.

Students choosing this unique curricular path will need to closely follow a prescribed sequence of courses and should consult closely with their advisor. The first two years of study will remain the same as the BSE curriculum. The third year will change slightly to accommodate the senior year when the student will take both Engineering and School of Law courses. Some summer School of Law courses will be necessary after the fourth year.

#### Accelerated Six-Year Electrical Engineering/Law Program

Qualified Electrical Engineering students have the opportunity to accelerate their attainment of a BSE in Electrical Engineering and a Law degree. Entrance requirements and standards necessary to maintain a tentative acceptance to the School of Law can be found in the “Six-year Engineering/Law Program” section of this catalogue.

Students choosing this unique curricular path will need to closely follow a prescribed sequence of courses and should consult closely with their advisor. The first two years of study will remain the same as the BSE curriculum. The third year will change slightly to accommodate the senior year when the student will take both Engineering and School of Law courses. Some summer School of Law courses will be necessary after the fourth year.

#### Accelerated Six-Year Industrial Engineering/Law Program

Qualified Industrial Engineering students have the opportunity to accelerate their attainment of a BSE in Industrial Engineering and a Law degree. Entrance requirements and standards necessary to maintain a tentative acceptance to the School of Law can be found in the “Six-year Engineering/Law Program” section of this catalogue.

Students choosing this unique curricular path will need to closely follow a prescribed sequence of courses and should consult closely with their advisor. The first two years of study will remain the same as the BSE curriculum. The third year will change slightly to accommodate the senior year when the student will take both Engineering and School of Law courses. Some summer School of Law courses will be necessary after the fourth year.

#### Accelerated Six-Year Mechanical Engineering/Law Program

Qualified Mechanical Engineering students have the opportunity to accelerate their attainment of a BSE in Mechanical Engineering and a Law degree. Entrance requirements and standards necessary to maintain a tentative acceptance to the School of Law can be found in the “Six-year Engineering/Law Program” section of this catalogue.

Students choosing this unique curricular path will need to closely follow a prescribed sequence of courses and should consult closely with their advisor. The first two years of study will remain the same as the BSE curriculum. The third year will change slightly to accommodate the senior year when the student will take both Engineering and School of Law courses. Some summer School of Law courses will be necessary after the fourth year.

#### Academy

Western New England University offers a variety of online courses through Academy, a consortium of like-minded accredited colleges and universities that share online course offerings.

#### Advanced Placement (AP)

The University will normally grant credit for AP subjects taken in high school and for which a student scores a 3 or higher on the standardized AP exam. A score of 4 or 5 may be required to obtain credit for a specific course. Appropriate credit depends on the specific academic program to which the credit is applied. In some circumstances, the credit will be applied to an elective rather than a course required for the major. The Dean’s office of each college will determine how the credits will be applied for courses taught in that college.

#### Air Force ROTC

Full-time undergraduate and graduate students may participate in the Air Force ROTC program at Western New England University. Upon successful completion of the program, students receive a commission as a Second Lieutenant in the U.S. Air Force or the U.S. Space Force. Classes are open to all students and may be taken for general education credits with no obligation. The University of Massachusetts—Amherst is the host Detachment for Air Force ROTC and you will attend classes at both UMass and WNE during your college career.

Students who contract and commit to pursuing a commission receive a tax-free \$350-\$500 per month stipend while participating in ROTC, based on their current academic level (Freshman, Sophomore, Junior, Senior). Four, three and a half, three, and two and a half year scholarships are available to students who apply and meet the requirement to contract into ROTC to pursue a commission. These tuition scholarships are worth at least \$18,000 per year and some cover 100% of tuition at any university.

There are limits to the amount of ROTC credit that can be counted toward a degree. Students majoring within the College of Arts and Sciences are limited to 15 credit hours, College of Business students are limited to 12 credit hours, and College of Engineering students are limited to 3 credit hours, which must be at the 300-level or above.

For more information, please contact AFROTC Det 370 at (413) 545-2437 or by email at [afrotc@acad.umass.edu](mailto:afrotc@acad.umass.edu)

## Army ROTC

Full-time undergraduate and graduate students may participate in the Army ROTC program at Western New England University. Upon successful completion of the program, students receive commissions as Second Lieutenants in the U.S. Army (Active or Reserve). Classes are open to all students and may be taken for general education credits with no obligation.

Students who contract and commit to pursuing their commission receive a \$500 per month stipend while participating in ROTC, for the 10 months that they are in school each year. Four, three, and two year scholarships are available to students who apply and meet the requirement to contract into ROTC to pursue a commission. These scholarships cover 100% of tuition and fees, \$1200.00 per year for books, and also pay each recipient a \$500 per month stipend.

Special programs exist for students with four semesters remaining to earn their degree and for students who desire to pursue a four-semester master's degree. This program allows the student to complete all ROTC requirements in only two years and gain a commission as a Second Lieutenant. The classes for the first two years are waived in this option.

Any Army ROTC student who desires a commission in the Army National Guard or Army Reserves may be eligible for a Guaranteed Reserve Forces Duty Scholarship. For further information refer to contact listed below.

There are limits to the amount of ROTC credit that can be counted toward a degree. Students majoring within the College of Arts and Sciences are limited to 15 credit hours, College of Business students are limited to 12 credit hours, and College of Engineering students are limited to 3 credit hours, which must be at the 300-level or above.

For information contact an assistant professor of Military Leadership at the Western New England University ROTC building; 413-782-1332, or [armyrotc@umass.edu](mailto:armyrotc@umass.edu)

## Air Force/Army ROTC College Incentive

Western New England University will provide up to full (double occupancy) room and board to any student receiving a four-year ROTC scholarship. If the student selects Gateway, Evergreen, or Southwood for residence, they will receive full (double occupancy) room and \$1,500. If the ROTC scholarship is less than full tuition, the incentive could be reduced accordingly.

Other students, including Advance Designees, who receive ROTC scholarships after enrolling at the University, will receive full (double occupancy) room during the period that they qualify for the ROTC scholarships.

The incentive will be considered part of all gift aid a student may receive from the University based on merit or need. In no case will the total gift aid provided by the University and external gift aid exceed the student's direct cost of education.

## Auditing

Subject to space limitations, a student may audit a course if granted approval by the instructor in which the course is offered. Auditing serves to enable a student to study the subject matter of a course when a grade is neither required nor desired. An audit carries no credit, has no grade point equivalent, and is recorded simply as "Audit." A student intending to audit a course should consult Enrollment Services for the proper procedure. (See the "Fees

(p. 434)" section.) See the academic calendar for deadline to change from "audit to credit" status or "credit to audit" status.

Graduate courses in the Colleges of Arts and Sciences, Business, and Engineering may be audited on a space-available basis by alumni who have completed bachelor's or master's degrees at Western New England University and who also have the listed prerequisites for the course selected. Courses in the School of Law are not available for alumni auditors. The University does not maintain any record of registration or completion of courses by alumni auditors.

## Certificate Programs

Western New England University makes several Certificate Programs available to those who do not want a degree, but who want specialized training that goes beyond a few courses in a subject.

There are undergraduate certificate (p. 170) programs in chemistry (p. 170) and communication (p. 170).

There are graduate certificate programs in engineering (p. 363) and leadership (p. 362).

SAP and SAS certificates (p. 170) are not available to non-degree seeking students.

## Center for Teaching Excellence

The Western New England Center for Teaching Excellence is designed to provide faculty with access to cutting-edge, empirically validated teaching strategies. Through workshops, faculty presentation, and consultation, the Center serves as a repository for teaching related information and gives students access to faculty who are well trained to be excellent in and out of the classroom. Founded in 2011, the Center will continue to build and develop programs focused on teaching and teaching related activities.

## Cooperating Colleges of Greater Springfield (CCGS)

Western New England University, in cooperation with seven of the area's public and private institutions, has established a cooperative association designed to enhance the educational experience through the use of cooperative programs and services. Those services include inter-college library privileges, joint student activities, academic cooperation, and student activity calendars.

Known as the Cooperating Colleges of Greater Springfield (CCGS), the association was formed in 1970 by the presidents of the member institutions: American International College, Bay Path University, Elms College, Holyoke Community College, Springfield College, Springfield Technical Community College, Western New England University, and Westfield State University.

CCGS also sponsors an eight-college exchange program. Under this plan for curriculum enrichment, any full-time undergraduate who has paid tuition at their own home college may take up to two courses or up to eight credit hours per semester each semester at any one of the other CCGS institutions, provided that the courses are not offered at the home institution and that seats are available at the host institution. Part-time students attempting at least six credit hours in a degree program are also qualified to participate in the CCGS program. The above-stated conditions may not apply to summer sessions, evening classes, winter session, continuing education classes, and online courses.

Information concerning additional guidelines and registration procedures may be obtained on the Enrollment Services website.

#### Credit for Prior Learning

Undergraduate students may satisfy up to 30 credit hours of their degree requirements through demonstration and documentation of prior learning. Outlined below are several vehicles through which prior learning may be assessed.

Note: This policy does not apply to Criminal Justice or Law Enforcement majors, who must consult the requirements specific to their degree.

#### *College-Level Examination Program (CLEP)*

This nationwide program allows undergraduate students to demonstrate academic competence and obtain college credit by examination. Several general and subject area examinations are available. The subject matter of the examination taken must be applicable to the student's curriculum, but may not include foreign language in the student's native language. The student's academic Dean must be notified of the intent to take such examinations. The scores must be submitted to the appropriate school for evaluation. CLEP credit may not be used to meet upper-level course requirements.

#### *Credit for Nontraditional Educational Experience*

The University will review for possible credit, educational programs sponsored by non-collegiate organizations such as business, industry, government, professional, voluntary associations, and workplace experience. Decisions to award transfer credit are based primarily upon *The National Guide to Educational Credit for Training Programs*, published by American Council on Education, and *The Directory of the National Program on Non-collegiate Sponsored Instruction*, published by the Board of Regents of the State of New York. In addition, courses and training obtained through the Armed Services will be reviewed on the basis of the recommendations made by the American Council on Education in *The Guide to the Evaluation of Educational Experiences in the Armed Services*.

#### *Portfolio-based Credit*

The Deans may award transfer credit for portfolio-based credits for prior learning that have been assessed by Charter Oak State College or other regionally accredited colleges or universities.

Students who are interested in obtaining more information about portfolio assessment should contact the Admissions office for referral to Charter Oak State College where appropriate.

#### Credit-in-Escrow

Qualified high school students may take regular college courses during the regular semester or in the summer as they complete their high school studies.

#### Exploratory Program

Recognizing that many students have not chosen a career path at the time of admission, the University offers direction and guidance through the Exploratory Program. Instead of selecting a major course of study, those students who prefer to defer such a selection may elect the Exploratory Program. The Exploratory Program has no specific course requirements. It provides special advising and guidance about career choices.

The selection of a major course of study is made before the end of the sophomore year. After declaring a major, the student leaves the Exploratory Program and follows the regular curriculum of the chosen program.

#### First Year Seminar

To enhance the first-time student's acclimation to collegiate study, the University provides opportunities to develop the skills and methods that will promote academic success and personal development. In the First Year Seminar courses (LA 100, BUS 101, ENGR 102) students explore such topics as goal-setting and decision-making, time management, problem solving, critical thinking, information literacy, public speaking skills, personal identity, and an introduction to a major or exploring fields of study.

#### Global Scholars Program

The Global Scholars program provides Western New England University students with the opportunity to distinguish themselves by developing an understanding of another region or nation outside of the United States through University coursework and international study experiences. While the structure of each Global Scholars program is determined and overseen by the College in which the student is enrolled, all Global Scholars programs include the following elements:

- An introductory experience or course
  - A period or periods of international study abroad
  - Completion of a sequence of courses in international issues, area studies, or foreign language
  - An integrating or capstone experience or course
- In addition, all Global Scholars are encouraged to participate in other globally-focused opportunities on campus.

Additional details regarding specific Global Scholars requirements are provided in each College's catalogue section: College of Arts and Sciences (p. 39) and College of Business (p. 106), the College of Arts and Sciences Special Academic Opportunities (p. 40) and the College of Business Special Academic Opportunities (p. 107) sections, or the College of Arts and Sciences, and College of Business web sites.

#### *Admission*

Please see the specific College's websites for further details on these special academic opportunities:

College of Arts and Sciences Special Academic Opportunities (p. 40)

College of Business Special Academic Opportunities (p. 107)

(p. 128)

(p. 106)

#### *Global Scholars Courses*

Recognizing the importance of a global perspective to the conduct of business today, the College of Business provides enhanced opportunities for its students to develop both intercultural competence and an expanded worldview. The Global Scholars program, which integrates intercultural course work and experiences, is open to students in any business major. Those students who satisfactorily complete all requirements will receive the Global Scholar designation on their University transcript and at Commencement.

College of Business Special Academic Opportunities (p. 107)

### Grand Challenge Scholars Program

Western New England University is proud to be among an elite group of institutions in the nation to offer the Grand Challenge Scholars Program of the National Academy of Engineering (NAE) to our students.

For more information, visit Grand Challenge Scholars Program (p. 128) under College of Engineering's Special Academic Opportunities.

### High School Year in College (Early Admission)

The high school student who is academically able and socially mature may combine the senior year of high school and the first year of college. At the end of the combined year, the student is granted a high school diploma and becomes a matriculating student.

### Honors Programs

Western New England University offers Honors programs in the:

College of Arts and Sciences

College of Business

College of Engineering

They are intended to give academically qualified and motivated students the opportunity to join a community and participate in challenging courses taught by some of the University's best faculty. The programs allow students to broaden their education by taking courses in a variety of disciplines with Honors students from other majors, and by exploring topics that cross disciplinary boundaries. The programs also encourage students to take an active part in leadership activities related to Honors.

### Admission

Qualified students who have been admitted to Western New England University, including transfers, will be contacted by their respective Colleges regarding Honors Program admission.

### Requirements

Students who are in good standing with the University and who have completed a minimum of 18 Honors credit hours (6 Honors courses or the equivalent) including a senior project will be recognized with University Honors at graduation.

### Honors Courses

All Honors courses are designed to fit graduation requirements.

HON (p. 248)

HONB (p. 250)

HONE (p. 251)

(p. 251)HONU (p. 253)

The courses are often small seminars, sometimes taught by pairs of professors from different disciplines. HONU courses welcome Honors students from any college and are graded Pass / Fail. Whatever the topic, Honors courses encourage students to develop and support their own ideas through critical reading, writing, analysis, and discussion.

### Senior Honors Project

Senior Honors students work closely with their faculty advisors to plan and execute a final project. Students have virtually complete

freedom in their choice of topic, but most opt for a topic within their majors. Interdisciplinary topics are entirely acceptable. Students who are already required to do an appropriate senior project for their major may, with approval, submit this as their honors project instead.

### Maintaining Honors Status

Students in the Honors Program must maintain a 3.3 overall GPA to graduate with University honors. Any student whose cumulative grade point average falls below 3.3 will be given two semesters during which to restore their cumulative GPA to 3.3 or better. Students whose GPA remains below 3.3 for a third semester will be dismissed from the program, although they may reapply if they subsequently raise their GPA to an acceptable level.

### Independent Study and Special Arrangements

A limited number of qualified students are accorded the opportunity to pursue coursework through supervised independent study. Students must have junior or senior standing plus a minimum grade point average of 3.0 overall or in the major field. In general, such study should be of mutual interest to the student and faculty supervisor, should be of an advanced nature, and should include work not normally covered in the classroom. Credit may vary from one to three credit hours. Only six credit hours of independent study credit may count toward the degree.

In order to enroll in an independent study course, the student must make arrangements prior to registration. Applications for independent study are available from the appropriate academic Dean. The application must be completed and signed by the student, the faculty supervisor, the faculty supervisor's department chair, and the student's advisor. If the student's academic Dean approves the application, the student is given a form authorizing registration for the study.

See "Special Arrangements (p. 32)" for information on special arrangement opportunities.

### Individualized Programs of Study (Integrated Liberal Studies)

For the student who does not want to pursue a traditional major program, the Integrated Liberal Studies program provides the opportunity to construct an individualized major. Such a program combines a selection of related courses from two or more disciplines according to the interests and goals of the student.

Students who wish to devise and pursue such a program should request permission and guidance from the academic departments in which they propose to do a substantial part of the work. Final approval of such a program rests with the Dean of the College of Arts and Sciences upon recommendation of the departments concerned. No request for an Integrated Liberal Studies major will be considered earlier than the end of the freshman year or later than the beginning of the senior year.

The following guidelines serve as minimum requirements for an Integrated Liberal Studies major:

1. The general course requirements for the BA degree shall apply.
2. An Integrated Liberal Studies major shall offer a minimum of 36 credit hours. At least 30 of these shall be courses at the 300-400 level.
3. Only courses at the 200 level or above may be counted toward fulfillment of the Integrated Liberal Studies major.
4. A minimum of the minor in Business Administration is required of any student desiring to do a substantial part of the work within

the College of Business. However, no more than 25% of the total coursework can be College of Business courses.

#### Internships

In any discipline, qualified juniors and seniors may undertake an internship for academic credit with an approved agency, organization, or business.

Internships have a single purpose: to further the student's knowledge in a specialized area in a way not customarily available within the regular classroom setting.

Credit for internships varies from one to three credit hours. There are limits to the amount of internship credit that may be counted toward the degree: in the College of Arts and Sciences and the College of Business, students are limited to six credit hours; and in the College of Engineering, students are limited to three credit hours. College of Business students are limited to one nonprofit board field experience. A student must have completed at least 60 credit hours and have a minimum GPA of 2.5 overall and in the major, except where an internship is required in the major, or obtain special permission of their Dean to undertake an internship.

To enroll in an internship for academic credit, a student must make arrangements with the Career Center, prior to registration. An internship application must be completed and signed by the student, the academic advisor, the department chair, and the internship coordinator.

A student may also pursue a nonacademic internship to further enhance their knowledge in a specialized area.

#### New England Center for Children Program

Western New England University students interested in applied psychology and the education of students with autism and other special needs have the opportunity to spend either a full semester or a full year at the New England Center for Children. This facility, located near Boston, offers courses in applied behavior analysis and provides students with supervised experience working with children with autism. Interested students should consult with the Chair of the Department of Psychology.

Selection of Students: Applications will be reviewed by the Department of Psychology and forwarded, along with the recommendations of the department, to the New England Center for Children. The Center will select the final participants.

#### Physical Education, Health, and Recreation

PEHR 163: Games Children Play is mandatory for those students pursuing certification in Elementary Education.

Other majors are welcome to enroll in Physical Education, Health, and Recreation (PEHR) courses, if they are so interested.

However, no more than two 100-level PEHR courses can be taken for academic credit or can be included in the calculation of a student's overall GPA.

#### Pre-Law and 3+3 Law Program

Western New England University has offered legal education for nearly a century, and the Western New England University School of Law provides an excellent opportunity for those who wish to pursue the graduate professional degree in law.

Preparation for law school is not a matter of taking prescribed courses or majors. Law schools customarily do not encourage undergraduates to major in any particular subject. Students are generally successful in law school if they succeed in any major that develops skills in reading, writing, and critical thinking, and if they do well on the Law School Admission Test (LSAT).

Pre-law students may choose any major including the pre-law curriculum within Integrated Liberal Studies. Students considering a legal education should pursue their individual interests through those courses that are most likely to foster success in American law schools (courses that improve written and oral communication, provide readings about a wide range of human experience, and develop reasoning skills).

Qualified Western New England University students who want to attend Western New England University School of Law can earn their bachelor's and Juris Doctor degrees in just six years instead of seven in the 3+3 Law program. To qualify for this program, students must have a minimum undergraduate grade point average of 3.3 and score above the median LSAT for the previous year's School of Law matriculants. Students who qualify can enter the School of Law in the fall of their fourth full-time undergraduate year and receive their bachelor's degrees at its end. They are eligible to obtain their Juris Doctor degrees after two more years of study.

It is not possible, however, for all majors to qualify for the 3+3 Law program. Chemistry, Computer Science, Forensic Biology, Forensic Chemistry, Health Sciences, Mathematics, and most engineering programs require too much sequential work in those disciplines to allow completion in three years. Biology majors would require some summer course work in order to complete this program.

In order to apply for this program, transfer students must successfully complete at least 45 credit hours of undergraduate studies at Western New England University. Students considering a career in law are eligible for membership in the Pre-Law Society, which provides cocurricular activities for pre-law students. Among the society's activities are workshops on selecting and applying to law schools; field trips to observe law classes; mock trials; and films, lectures, and discussions designed to clarify the responsibilities and privileges of the profession of law.

The office of the pre-law advisor maintains files of reference materials on law schools, the Law School Admissions Test, and other subjects of interest to pre-law students. Regardless of major, students thinking about attending law school should consult with the pre-law advisor, Associate Professor Peter Fairman, Department of History and Political Science, at the earliest opportunity.

#### Pre-Medical and Pre-Dental

Pre-medical and pre-dental students are not restricted to a specified major, but are encouraged to select a major that is most consistent with their interests and that offers as many alternatives for postgraduate study or employment as possible. Students in Arts and Sciences, Business, and Engineering are able to pursue a pre-med program. Students should consult with their Deans in selecting appropriate courses.

The suggested sequence of courses: BIO 107, BIO 108, BIO 117, BIO 118; CHEM 105, CHEM 106, CHEM 209, CHEM 210, CHEM 219, CHEM 220; PHYS 123, PHYS 124; MATH 123, MATH 121.

Additional suggested courses would include: sociology, psychology, and biochemistry.

As early as possible, all pre-medical and pre-dental students should consult the Dean of the College of Arts and Sciences, who will arrange for proper advising prior to the selection of courses. The

recommended course sequence is designed to meet the requirements for entrance into most American medical and dental schools; it is the responsibility of the student to ensure that they take all requirements of a particular program. Students are cautioned, however, that admission to such schools is highly competitive.

**Pre-science**

The Pre-science program offered by the College of Arts and Sciences is a one-year program that provides an opportunity for students to work towards acceptance into one the College's science majors (Biology, Chemistry, Forensic Biology, Forensic Chemistry, Health Sciences, and Health Studies) offered by the Department of Physical and Biological Sciences.

Qualified students can be admitted into the Pre-science program as freshmen by WNE Admissions for the fall semester of a given year.

The program is designed to prepare students for the rigor of major-level science courses, while at same time working on completing courses that will fulfill major and/or general University requirements.

The course sequence of the Pre-science program is outlined below:

1. The lab science courses, PHYS 103 and CHEM 103, are specifically designed to introduce students to basic concepts in physics and chemistry with an emphasis on quantitative methods and laboratory investigations.
2. The choice of the English and Math courses in the fall semester will be determined by the student's prior education and the student's performance on the WNE Math and English placement tests.
3. The courses in the spring semester will be determined in conference with the Pre-science advisor and will depend on the science major the student is interested in pursuing and on which Math and English courses were completed during the fall semester.

During the spring semester, students interested in:

- Biology should consider taking a PHYS 15X course, which (together with PHYS 103) will complete their physics requirements.
- Forensic Biology or Forensic Chemistry should consider taking CJ 101, which is a required course for these majors.
- Health Sciences or Health Studies should consider taking PSY 101, which is a required course for the major.

Students wishing to petition for a change of major to a science major after completing the Pre-science program have to:

1. Complete the Pre-science course sequence as listed below.
2. Consult with their Pre-science advisor with regards to their spring semester and sophomore year course choices.
3. Maintain an Overall GPA of 2.5 and a Science GPA of 3.0.
4. Apply to their Pre-science advisor at the end of the freshman year for acceptance into the desired science major.

After successfully completing the Pre-science program, students

should expect to spend at the minimum an additional:

- Three years of courses to obtain a BS in Biology, a BS in Health Sciences, or BS in Health Studies.
- Four years of courses to obtain a BS in Chemistry, BS in Forensic Biology, or a BS in Forensic Chemistry.

The suggested sequence of courses:

**Freshman Year**

*Fall Semester—14 crs*

PHYS 103 Elementary Physics 3

or

PHYS 101 Elements of Physics 3

CHEM 103 Elementary Chemistry 3

or

CHEM 101 Modern Chemistry I 3

LA 100 First Year Seminar 2

ENGL 132 English Composition I 3

MATH 109 Pre-Calculus 3

or

MATH 123 Calculus I 3

**Freshman Year**

*Spring Semester—16-17 crs*

PHYS 15X Natural Science Persp. 3

or

CHEM 105 General Chemistry I 4

or

GEN XXX General Elective 3

ENGL 133 English Composition II 3

MATH 121 Stats & Probability 3

or

MATH 123 Calculus I 3

or

MATH 124 Calculus II 3

PSY 101 Introduction to Psychology 3

or

CJ 101 Introduction to Crim. Justice 3

GEN XXX General Elective 3



### Service Members Opportunity College

Western New England University has been designated as an institutional member of Service Members Opportunity Colleges (SOC), a group of over 400 colleges and universities providing voluntary post secondary education to members of the military throughout the world. As an SOC member, Western New England University recognizes the unique nature of the military lifestyle and has committed itself to easing the transfer of relevant course credits, providing flexible academic residency requirements, and crediting learning from appropriate military training and experiences. SOC has been developed jointly by educational representatives of each of the Armed Services, the Office of the Secretary of Defense, and a consortium of 13 leading national higher education associations.

### Special Arrangement

A Special Arrangement course is designed for students who cannot fit a regularly offered course into their schedule. An arrangement is reached with a faculty member whereby the student can complete the course in a nontraditional format without sacrificing standards of requirements.

In order to enroll for a Special Arrangement course, the student must make arrangements prior to registration. Applications are available from the appropriate academic Deans. The application must be completed and signed by the student, the faculty supervisor, the faculty supervisor's department chair, and the student's advisor. If the student's academic Dean approves the application, the student is given a form authorizing registration for the course.

### Study Abroad

#### *Why Study Abroad?*

Western New England University provides numerous study abroad opportunities. Besides being culturally rewarding and intellectually stimulating, study abroad will enhance your career opportunities and graduate school qualifications. By gaining an appreciation of other cultures, improving your foreign language skills, and becoming more familiar with the global marketplace, you'll open your mind to new possibilities and in the process, learn as much about yourself as you will about your host nation.

#### *Are There Academic Requirements?*

The foreign university specifies the required grade point average, but in most cases you'll be able to participate as long as you are in good academic standing.

#### *What About Costs?*

Besides airfare and possible differentials in costs of living, the costs are usually equivalent to what it costs to attend Western New England University for a similar time period. However, additional expenses will occur for those who are adventurous and enjoy traveling. Financial aid, either from the institution or government, can be carried over.

#### *Are Internships and Independent Studies Available?*

Yes, internships and independent studies are available at most study abroad locations. Internships are especially valuable for all students who are interested in pursuing international opportunities.

#### *Do I Need to Know A Second Language?*

While most classes are taught in English, you will probably want to seek out opportunities to learn the native language. You can choose programs that are specifically designed to improve your foreign language skills.

#### *In What Countries Can I Choose To Study?*

You can make arrangements to study at colleges and universities throughout the world. Pick the nation where you want to live, study, and work. Western New England University will facilitate your international learning experience for one or two semesters. Special opportunities exist for all students to study in Mexico, Ireland, Scotland, England, Germany, France, Spain, Greece, Australia, New Zealand, and some other countries during winter, spring, and summer breaks.

For information on any of these programs, students should contact Dean of the College of Arts and Sciences, director of the Study Abroad Program.

#### *Up with People*

Through the Up with People partnership, Western New England University students can spend a semester traveling across three continents while experiencing personal growth, leadership training, service learning, and involvement in performing arts. A student completing a semester at Western New England University with a grade point average of 2.5 or better and who has successfully completed 27 credits or more is eligible to participate in the Up with People program. For details about this opportunity, students should consult with the Assistant Dean of Arts and Sciences and visit [www.wne.edu/upwithpeople](http://www.wne.edu/upwithpeople).

#### Summer Session and Winter Session

Western New England University is in session throughout the year. To supplement the regular academic semesters, there is a summer session with 6-week, 8-week and 12-week courses offered during the day and evening, both on campus and online.

A winter session offering online courses is held prior to the spring semester. Information about these course offerings is customarily available by March for the summer session and November for the winter session.

See Course Load for Abbreviated Term Enrollments (p. 18).

Schedule information may be obtained by contacting the Office of Academic Scheduling, <https://www1.wne.edu/academic-affairs/academic-scheduling.cfm> or Enrollment Services, <https://www1.wne.edu/student-administrative-services/index.cfm>

The per credit rate for the summer session and winter session course(s) are listed at <https://www1.wne.edu/cost-and-aid/undergraduate/cost.cfm>

#### Taking Courses At Another College

A matriculating student who wants to take a course at another institution must obtain prior approval from their College's Assistant Dean. Grades less than C- will not transfer. After completing 70 or more credits at Western New England University, a student is only permitted to transfer one course to Western New England University from a community college or another institution that does not grant the baccalaureate degree.

## Undergraduate Research

A limited number of qualified undergraduate students may undertake supervised research if they show both interest in and aptitude for independent and creative work. Applications may be made for research in any of the disciplines in which faculty are willing to involve students. When such research is conducted, students must submit written reports for approval by the faculty of the department in which the work was conducted. The supervising faculty member and the department chair must approve grades for such work.

In order to enroll for undergraduate research, the student must make arrangements in writing prior to registration. Applications are available from the Deans of the Colleges of Arts and Sciences, Business, and Engineering. Applications must have the signatures of the student, the faculty supervisor, and the department chair. If the Dean of the College approves the application, the student will be given a form authorizing registration for the work.

## Undergraduates Taking Graduate Courses

Full-time seniors who have a 3.000 or higher cumulative GPA may apply through their academic Dean's office to enroll in graduate 500/600-level courses. Juniors who meet the same GPA criteria may also be considered on a case-by-case basis. The student may enroll in a course provided:

- there is space available in the course
- the academic Deans of the student's college and the college offering the course approve the registration
- the student has met the prerequisites of the course
- the course is being applied to the student's undergraduate program as an elective or as a substitute for a course with comparable content

Students may only take graduate courses that will apply to their undergraduate program. Approval is limited to a maximum of six graduate credits per term (or billing cycle) and 12 graduate credits overall. Students may not enroll in courses that end after their expected undergraduate commencement date. For example, a student graduating in May is permitted to take an 11-week winter course since winter terms end in March or April. A student graduating in May would not be permitted to take an 11-week spring course since these terms end in June.

Students who meet the above criteria take the graduate credits as part of their full-time undergraduate tuition rate. As such, students must be enrolled for a minimum of 12 credits in the student's term structure. Winter courses count toward spring for purposes of billing and financial aid. Credit will be applied to a graduate program at Western New England University if the student matriculates within six months of completing undergraduate degree requirements for grades of "B" or better. Upon acceptance into the graduate program, the student may request transfer of these graduate courses. Grades will not count again at the graduate level. Students officially accepted into a graduate program will be considered a matriculated graduate student after receiving their undergraduate degree and subsequently enrolling in graduate courses.

This guidance does not apply to students simultaneously enrolled in undergraduate and graduate programs such as the 3+3 Law or the Four-year Bachelor/Master of Science in Accounting programs.

## Washington Semester

Western New England University participates in the Washington Semester Program offered by American University in Washington, DC. This program, which is open to juniors and seniors, provides an

opportunity to study and intern in Washington, DC. Programs are offered in American Politics, Journalism, Justice, Foreign Policy, International Business and Trade, Transforming Communities, Public Law, Economic Policy, Contemporary Islam, International Environment and Development, Israel Studies, International Law and Organization, and Peace and Conflict Resolution. Students may intern with government agencies, members of Congress, the courts, private businesses, public interest groups, professional organizations, newspapers, television studios, theaters, or museums. Interested students should contact Dr. Donald Williams.

## Writing and Reading Program

### *Writing Proficiency*

In the belief that clear writing is not only central to academic success but also the single most important indicator of professional achievement, the University encourages students to think clearly and to discipline their self-expression. In every course, regardless of the student's major, professors expect students to demonstrate in clear and effective writing that they have assimilated the information and ideas presented. A portion of the grade in each course is determined by performance in written work.

To achieve this goal, the Writing and Reading Program and the Department of English have formed the writing and reading collaborative that determines standards for clear writing and has authorized the use of common handbooks across the curriculum. The Writing and Reading Program starts in the first year with the two 100-level courses in English writing and reading that are General University Requirements. (A detailed description of the writing requirements appears in the English course descriptions). The program continues in the sophomore, junior, and senior years with writing requirements specified by the student's major.

In support of this program, the University has a Writing Center and offers tutoring services. The Center is equipped with two computer classrooms as well as print resources and a webpage. Trained peer tutors work with students at all ability levels in all phases of the writing process. Students may work on writing assignments in any course from across the curriculum, design individualized improvement programs, or work on personal writing projects.

## General University Requirements

All students must have a minimum of 40 credit hours of General University Requirements, which shall be filled by courses in the Foundations and Perspectives of Understanding as outlined below.

### Foundations

Fundamental to every student's success in college and beyond is competency in six areas that provide the foundation for lifelong learning and for personal and professional effectiveness. These areas are mathematical analysis, written communication, oral communication, critical thinking, computer competence, and information literacy. The University recognizes the importance of continuing development in these areas in the context of the student's major. The target level of competency in these areas will be determined and assessed by the major in which the student is enrolled. Following is a brief explanation of the importance of each foundation area.

### *Computer Competence*

Understanding how to use computer technology is necessary in virtually all professional and personal aspects of life. While computer usage is a ubiquitous requirement in university courses—for word processing, research, communication, and much more—it is critical for students to have the ability to use tools appropriate to their

primary discipline for the purposes of computation, data collection, and/or data analysis.

### *Critical Thinking*

The ability to reason logically and to evaluate and analyze arguments or problems is important in reaching sound decisions. The educated person should be able to solve problems and reach conclusions based on a thorough analysis of the evidence, and also be able to defend such conclusions in a clear and convincing manner.

While critical thinking is an element in virtually every course, each student must take one course in which critical thinking is a major focus.

### *Information Literacy*

The ability to access and evaluate information on the internet, in existing databases, in the press, and in academic journals and books is an essential tool in today's world. Students should have the ability to identify, access, evaluate, and responsibly use relevant resources and research in order to satisfy a defined information need. To develop skills in information literacy, instruction will be provided as part of each student's first year curriculum and standard coursework.

### *Mathematical Analysis*

Daily life, many professional and intellectual pursuits, and success in college require an understanding and appreciation of mathematical reasoning and problem solving. The ability to establish connections between real world phenomena and mathematical ideas, to employ logical mathematical reasoning, to properly use mathematical equations, and to analyze quantitative data allows us to grasp complex issues, solve problems, and better meet the needs of our technological society.

Each student must take two foundational mathematics courses. A minimum grade of C- is required in at least one of these mathematics courses for graduation.

See College of Engineering for Mathematical Analysis (p. 130) requirement.

### *Oral Communication*

Being able to communicate well verbally is also essential for success in the modern world. The ability to deliver effective oral presentations includes a logical organizational structure as well as sufficient factual support for one's key points. Additionally, having a clear and engaging presentation style helps with effective public speaking.

To develop skills in oral communication, instruction will be provided as part of each student's first year curriculum or standard coursework.

### *Written Communication*

Effective writing is important in virtually all human activities, from informal exchanges with friends and family to more formal intellectual pursuits and the professional responsibilities of the workplace. The ability to express ideas in writing, using appropriate

sentence structure, grammar, and mechanics, as well as a detectable thesis and logical support for the thesis, allows us to communicate effectively with others.

To develop skills in written communication, each student must take two foundational English composition courses. Because writing and reading are closely related and because all students should have some college experience of literature, these courses also feature the analytic reading of literary texts in a cultural context. Each student must complete both of these writing courses with grades of C- or better.

### *Perspectives of Understanding*

Western New England University is committed to developing in its students an appreciation of multiple perspectives of understanding. Perspectives are the systematic ways various academic disciplines view and interpret the world around us. Each perspective enhances the students' understanding of the complexity of the environment in which we live and of the richness of human experience. Ultimately, these perspectives have the potential to expose us to a breadth of disciplines, deepen our judgments, and inform our responses to the opportunities and challenges of life and work in the 21st century. They can help us to lead more responsible and fulfilling lives as individuals, family members, and citizens of democracy.

Perspectives courses generally emphasize three components. First is the approach or method of analysis in the discipline; second is the factual foundation of the discipline; and third is the contribution of the discipline to a greater knowledge of contemporary issues. Perspectives of Understanding included in the General University Requirements are Aesthetics, Ethics, Global Cultures, History, Natural Science, and Social/Behavioral Science.

Students must complete a minimum of six perspectives courses that collectively achieve the following requirements:

- All perspectives are covered.
- Two are natural science courses, each with laboratories, or two sequential courses in natural science, the first of which must have a laboratory. Note: Comparative courses that combine two perspectives, such as Global Cultures and Aesthetics, will satisfy the requirement in both areas. However, students must still take a minimum of four perspectives courses in addition to the two natural science courses.

### *Aesthetic Perspective (ART, FILM, MUS, and THTR)*

The aesthetic perspective regards objects in terms of the qualities that make them attractive in and of themselves. Whatever the objects, they are valued not for any utilitarian purpose, but for their inherent richness, their sensual and emotive effect, their form, line, color, sound, texture, feeling, and meaning. Through this perspective, students learn to articulate the economic, political, cultural, historical, professional, scientific, and/or social context for an art form, artwork, or performance.

Courses that satisfy this perspective may be a performance or studio art class or they may be a history or appreciation course.

### *Ethical Perspective (Any PH excluding PH 110 or PH 204)*

The goal of the ethical perspective is to help students form rationally defensible ethical views to guide their behavior in all aspects of their lives. This requires heightening their sensitivity to ethical issues and

providing them with a variety of tools for ethical problem-solving. It involves giving students experience in critical analysis of real-life ethical issues, coupled with a critical examination of the most influential techniques of moral decision-making and moral argument.

### *Global Cultures Perspective (CUL)*

The global cultures perspective gives students an awareness of the multicultural nature of contemporary society, as it is constituted by individuals from different backgrounds, cultures, and/or nations. Students learn about the significance of essential terminology, concepts, events, and/or people important to another culture. This perspective increases students' understanding of the values, attitudes, and beliefs of a distinct culture, as well as the conflicts, differences, and/or changes that have occurred within that culture.

### *Historical Perspective (HIST)*

Through historical inquiry, this perspective enriches insight into the political, social, economic, and cultural forces that have shaped the modern world, providing the context for future events.

### *Natural Science Perspective (NSP)*

The science perspective cultivates familiarity with the vast realm of accumulated knowledge about the structure and functioning of the physical and biological world. Students should learn part of the factual foundation, including vocabulary, of at least one major area of science and should observe and practice the disciplined logic that scientists employ to discover and evaluate new knowledge.

### *Social/Behavioral Science Perspective (SBP)*

The behavioral science perspective uses scientific methods to study the forces and processes that influence the behavior of individuals, groups, governments, and economies.

### First Year Seminar

First year seminars orient students to the scholarly community and assist them in their transition to the academic demands of college. Each College will develop courses to meet its needs (p. 429).

Exemptions to this requirement may be based on the following circumstances:

- Transfer credit of 27 or more semester hours from a two- or four-year college derived from a full-time course of study. Exemption may be further considered on an individual case basis, provided that a minimum of 21 credit hours are transferred through full-time study.
- Transfer credits cannot be from CLEP, AP, IB, or high school to college sources.
- Non-traditional adult learners are exempt from the requirement and the equivalent credit.

In all cases of exemption, substitute credit must be applied, i.e. credits toward the degree are not exempt, simply the course.

## Strategic Initiatives

The Center for Strategic and Academic Initiatives (p. 321)' primary goal is international recruitment of students and development of undergraduate and graduate degree programs (traditional, professional, online, alternative/intensive scheduling, on-site, off-site, graduate full- and part-time interdisciplinary, "boutique" in nature, in-house, or outsourced, etc) as well as non-credit/certificate programs. The Center will serve as an incubator to implement credit and non-credit programs and degrees that the University determines should be launched to take advantage promptly of opportunities that

are sought out or that present themselves and that permit the University to reach new audiences. In addition, the Center and the Office of Professional Development Programs is responsible for the development of new continuing education and non-credit opportunities to meet employer, employee, professional, and personal development needs within our region. This initiative may include the development and implementation of new graduate programs, and the development of other entrepreneurial opportunities.

### Professional Development Programs

The Office of Professional Development offers an array of professional development/education programs. Conferences, seminars, noncredit courses, and certificate programs are offered through public formats and on site at organizations. These programs are designed to help professionals quickly update or acquire the job-related skills and information that will enhance their ability to be successful in their chosen professions.

All on-site programs can be customized to meet any organization's needs. We welcome the opportunity to meet with you to discuss your specific training needs and design a proposal for your review. If meeting space or computer resources is an issue, let us know and we will be happy to provide these services at our Springfield campus.

For brochure requests and complete details on all of our professional development programs, call 1-800-660-9632 or visit website, <https://www1.wne.edu/professional-development>.

### Annual Conferences and Certificate Programs

#### *Regional Social Work Conference (33 years)*

This conference is an all-day event comprised of 40+ individual workshops. These workshops vary in topics ranging from AIDS and domestic abuse to professional burnout and new policies. The conference also provides a forum for information exchange on contemporary issues and networking opportunities for human service professionals throughout New England.

#### *Tax Institute*

For more than 50 years, the Tax Institute has provided high quality written (and computer) materials, oral presentations from expert speakers on detailed tax structuring, and planning techniques and their practical applications. It addresses timely topics and updates based on changes or developments in the tax law with a focus on the planning opportunities and pitfalls which may result from those changes.

### Professional Development Workshops and Trainings

#### *Fundamentals of Engineering/Engineering-in-Training (FE/EIT) Review Course*

This 10-session course reviews fundamental engineering subjects, mathematics, and basic sciences to prepare engineers for the General Fundamentals of Engineering Exam. University faculty review concepts and solve problems similar in type and complexity as those encountered on the exam. This course is offered in January in preparation for the spring exam.

#### *Social Work Workshops*

Western New England University's Office of Professional Development, and Social Work Advisory Council sponsor professional development workshops on current issues in the human service field. These workshops have served the needs of human service professionals from Massachusetts and surrounding states by providing a minimum of five programs yearly for CEUs for social

workers; licensed mental health workers, CADAC, Marriage and Family Therapists; and PDPs for educators.

For detailed information, visit our website, [www.wne.edu/pd](http://www.wne.edu/pd) or call 1-800-660-9632.

## LEGEND FOR NOTES IN SEQUENCE OF COURSES

A & SR: College of Arts and Sciences Requirement

BUSR: College of Business Requirement

ER: College of Engineering Requirement

CR: Concentration Requirement

GUR: General University Requirement

MR: Major Requirement

## UNDERGRADUATE DEGREE PROGRAMS

### Notes

See Legend for Notes in Sequence of Courses (p. 37)

## College of Arts and Sciences

Dean Marcus C. Davis

Associate Dean Jonathan M. Beagle

Assistant Dean Karl Martini

### Programs of Study

The College of Arts and Sciences has three primary objectives:

1. To provide academic major and minor programs within the College as career preparation and as concentrations in the various fields of the liberal arts.
2. To provide the courses that satisfy General University requirements in keeping with the founding purpose of the College and consistent with the ongoing role of Arts and Sciences and the academic expertise of the faculty.
3. To provide required courses for its own majors and minors, foundation courses for majors in the Business and Engineering Colleges, and elective courses for the enrichment of students across the University.

In this way the College of Arts and Sciences fulfills its educational purpose in accordance with the mission statement of Western New England University. This Mission Statement calls for integrated professional and liberal education. Arts and Sciences contribute to that mission through providing major programs, General University courses, and service and elective offerings.

The College of Arts and Sciences offers courses and programs leading to a Bachelor of Arts degree with majors in economics, communication, English, law and society, philosophy, political science, history, creative writing, international studies, liberal studies, psychology, or sociology; a Bachelor of Science degree with majors in biology, chemistry, computer science, criminal justice, forensic biology, forensic chemistry, health sciences, information technology, mathematics, neuroscience, or psychology. Majors in elementary and secondary education are approved by the Massachusetts Board of Education and lead to teacher certifications. Also offered is an Associate's Degree in Liberal Studies.

To graduate, students must complete at least 120 semester hours in academic courses. Students must complete the requirements of a major program, the General University requirements, and certain area requirements. The balance of the academic program is composed of electives, which are courses chosen entirely by the student, with guidance from an advisor.

Most students attempt to complete the General University requirements during their first two years in college. Such planning provides added flexibility during the junior and senior years, enabling students to concentrate on major programs or to participate in internships or off-campus programs such as the Washington Semester, the New England Center for Children internship program, or study abroad.

### Minors

The course work for a degree may include one or more of the minors offered by the University. A minor may not be completed in the same discipline as the major. Descriptions of the requirements for the minors (p. 156) are listed. Students wishing to take a minor must complete a form in the Office of the Dean, College of Arts and Sciences, no later than the beginning of the final semester.

College of Arts and Sciences Department Chairs and Faculty

### Department Chairs and Faculty

*Communication, Media, and Arts Faculty*

### Department of Communication, Media, and Arts

#### Communication

Professor: Douglas Battema, Chair

Professors: Hsiu-Jung "Mindy" Chang, Andrea Davis, Jean-Marie Higirot

Assistant Professor: Jocelyn A. DeAngelis

Professional Educator: Brenda Garton

#### Arts, Theatre, and Music

Professor: Hillary Bucs

*Computer Science and Information Technology Faculty*

### Department of Computer Science and Information Technology

Associate Professor: Brian O'Neill, Chair

Professors: Heidi Ellis, Lisa Hansen, Herman Lee Jackson II

Associate Professor: Paul-Marie Moulema Douala

Professional Educator: John Willemain

*Criminal Justice, Sociology and Social Work Faculty*

### Department of Criminal Justice, Sociology & Social Work

#### Criminal Justice and Sociology

Professor: Lisa Muftic, Chair

Professors: John Claffey, Michaela Simpson

Associate Professors: Creiag Dunton, Kathryn Kozey

Assistant Professor: Chidike Okeem, Joshua Reagan

#### Social Work

Professional Educator: Kate LaPlatney

*Education Faculty*

### Department of Education

Professor: Deb Patterson, Chair

Associate Professor: Raymond Ostendorf

Assistant Professor: Tamara Shattuck



*English and Cultural Studies Faculty*

**Department of English and Cultural Studies**

**English**

Professors: Janet Bowdan, William Grohe, Chip Rhodes, Edward Wesp

Associate Professor: Kelly Klingensmith

Assistant Professors: Daniel Bevacqua, Christine Crutchfield

Professional Educators: Linda J. Oleksak, Stephanie Wardrop

**Cultures and Language**

Associate Professor: Sandra Navarro, Chair

*History, Philosophy, Political Science, and Economics Faculty*

**Department of History, Philosophy, Political Science and Economics**

**History, Political Science, Law and Society and International Studies**

Professor: Donald Williams, Chair

Professors: John Seung-Ho Baick, Jonathan Beagle, Meri Clark, Marc Dawson, William Mandel, Catherine Plum, Leonard T. Vercellotti, Donald Williams

Associate Professors: Peter Fairman, Laura L. Janik

Assistant Professors: Andrea Castonguay, Nathan Dean

**Philosophy**

Associate Professors: Heather Salazar, Valerie Racine

**Economics**

Professors: Arthur Schiller Casimir, Anita Dancs, Herbert Eskot, Ranganath Murthy

Associate Professor: Karl Petrick

*Mathematics Faculty*

**Department of Mathematics**

Professor: Ann Kizanis, Chair

Professors: Jennifer Beineke, Saeed Ghahramani, Lorna Hanes, Lisa Hansen, Enam Hoq, David Mazur, Caleb M. Shor

Associate Professors: Marcel Carcea, Thomas Hull, Seungly Oh

Assistant Professor: Lu Wang

Professional Educators: Christine Selig, John Willemain

*Physical and Biological Science Faculty*

**Department of Physical and Biological Sciences**

Associate Professor: Emily Ford, Chair

Professors: Dawn E. Holmes, Anna Klimes, Suzanna Milheiro, Anne Poirot, Burt Rosenman, Alexander Wurm

Associate Professors: Nuwan De Silva, Daniel Hatten, Akbar Jaefari, Keri A. Lee, Kathryn Lipson, Thomas Mennella, Karl Martini, Sean McClintock, Liang Ren Niestemski, Nolan Samboy, Isaac Stayton

Assistant Professors: Justin Foy, Georgiana Gibson-Daw, Philip Kiefer, Na Liu

Professional Educators: Joseph Gallant, Francis G. Gerberich, Melissa Lail-Trecker Jonathan Leake, Jason Rennie, Mary Rothermich

*Psychology and Neuroscience Faculty*

**Department of Psychology and Neuroscience**

**Psychology**

Professor: Denine Northrup, Chair

Professors: Jessica Carlson, Ava Kleinmann, Dennis Kolodziejewski, Jonathan Pinkston, Dongxiao Qin, Jason Seacat, Rachel Thompson

Assistant Professors: Amy Henley, Deana Vitrano

Professional Educator: Alison Castellano

**Neuroscience**

Professor: Sheralee Tershner

Associate Professor: Michael Jarvinen

College of Arts and Sciences Special Academic Opportunities

**Special Academic Opportunities**

**Honors Program** (p. 29)

**Global Scholars Program**

The Global Scholars program provides Western New England University students with the opportunity to distinguish themselves by developing an understanding of another region or nation outside of the United States through University coursework and international study experiences. While the structure of each Global Scholars program is determined and overseen by the College in which the student is enrolled, all Global Scholars programs include the following elements:

- An introductory experience or course
- A period or periods of international study abroad
- Completion of a sequence of courses in international issues, area studies, or foreign language
- An integrating or capstone experience or course

All Global Scholars are encouraged to participate in globally-focused opportunities on campus.

Additional details regarding specific Global Scholars requirements are provided in each College's catalogue section: College of Arts and Sciences and College of Business.

Western New England University offers Global Scholars programs in the College of Arts and Sciences Special Academic Opportunities and

the College of Business Special Academic Opportunities.

#### University Global Scholars—College of Arts and Sciences Program

The College of Arts and Sciences encourages all students to understand regions and nations outside of the United States through University courses and international experiences. The Global Scholars program helps students prepare for and reflect upon their pre-departure, international, and re-entry processes to cultivate their intellectual and intercultural learning.

Global Scholars supports students in connecting their international and intercultural courses and experiences to their academic, professional, and personal endeavors. It is open to students from any major in the College of Arts and Sciences. Students who satisfy all requirements will receive the Global Scholar designation on their University transcript and at Commencement.

To earn the College of Arts and Sciences Global Scholar designation, a student must complete successfully:

International and Intercultural Orientation and Reflection (INST 100, 2 credits, to be completed by the end of the sophomore year), which aims to develop students' skills in learning about and reflecting on cultural differences in education and work abroad. It serves as a pre-orientation to international and intercultural education. This course is open to any University student.

Minimum six credits of study outside the United States that are completed in one or more international study experiences. This may be accomplished in many ways: through participation in the Freshman Semester in London, in one of the College's many study abroad courses, in a semester or summer program arranged via the University's Study Abroad Office, or in a combination of courses or travel-study experiences during summer or winter breaks.

Exceptions to the international study experience may be granted for a student pursuing intensive language training (i.e. 15 credits of a foreign language may replace 3 credits of study abroad).

Minimum six credits of University or international courses on foreign languages, regions, or cultures, or on global issues relevant to a student's international and intercultural focus.

A capstone experience completed in the senior year (1-3 credits) that provides Global Scholars with active reflection on their international or intercultural experiences and how that learning connects to their University studies. The capstone will follow the international or intercultural experience and must be developed in consultation with the Coordinator of Global Scholars. This requirement may be aligned with the Honors Program and/or major program requirements in the College of Arts and Sciences.

Students must be in good academic standing to participate in study abroad and to graduate with Global Scholars recognition. Particular study abroad programs may require higher standards of admission.

Contact Dr. Meri Clark (meri.clark@wne.edu), the Coordinator of the University Global Scholars College of Arts and Sciences Program for more information.

### College of Arts and Sciences Requirements

Students in the College of Arts and Sciences are required to satisfy the General University Requirements (p. 33). All students majoring

within the College of Arts and Sciences must also fulfill the following requirements:

1. Complete at least 120 credit hours of courses in order to graduate.  
Note: No more than 15 credit hours of ROTC courses may be counted within this 120;
2. Complete the requirements for a major;
3. Complete at least 7 Perspectives of Understanding (p. 34) courses, including two natural science courses and one course from each of the remaining five Perspectives of Understanding;
4. Writing Intensive Requirement (WIC)  
  
Complete at least six additional credit hours in courses designated as "Writing Intensive," one at the 200- or 300-level and one at the 300- or 400-level. Courses designated as Writing Intensive can also fulfill other requirements, including General University Requirements and requirements for specific majors. All Writing Intensive courses are approved by the Department of English; and
5. Complete at least 30 credit hours in advanced courses (numbered 300-400) that may include those in the major and other areas, or complete the requirements for a major and a minor.  
No ROTC courses may count as advanced courses.

Non-business majors can apply no more than 25% of business coursework to their graduation requirement.

#### Actuarial Sciences

### Actuarial Science Major

#### General Information

Actuaries are business professionals who quantify, model, and analyze risk in a business environment. Wherever risk or uncertainty is present, such as in the contexts of life, property or casualty insurance, health care, or in the financial management of pensions or annuities, actuaries are needed to understand and manage that risk. An actuary needs to have a solid grounding in the theory and applications of calculus, probability and statistics, mathematical finance including interest theory, and various mathematical modeling techniques.

In addition to their mathematical analysis and problem-solving abilities, actuaries need to have excellent oral and written communication skills as well as an understanding of economics, finance, and corporate structure and decision making. An ideal actuary has mastery of technical mathematical material, can apply it in its proper context, and can communicate it to an appropriate audience.

#### Career Opportunities

The job of actuary is consistently rated very highly in terms of job satisfaction, salary, employment outlook, work environment, and growth opportunity. One can usually find it at or near the top of annual "best jobs" lists. Actuaries are in high demand and are most commonly employed in the insurance, financial services, and health care industries as well as in government agencies. The numerous such companies present in the Springfield-Hartford corridor means that actuarial jobs are relatively plentiful, and even more opportunities are possible in the greater Boston and New York areas. Graduates of Western New England have obtained positions at many

of these companies.

**Program Objectives**

The Actuarial Science major is housed within the Department of Mathematics and follows the educational recommendations of the two largest actuarial-related professional societies in the US: the Society of Actuaries (SOA) and the Casualty Actuary Society (CAS). A student who successfully completes the Actuarial Science major will:

1. Demonstrate knowledge of mathematical concepts needed for actuarial science.
  - a. Demonstrate knowledge of foundational concepts in probability, introductory statistics, and interest theory.
  - b. Demonstrate the ability to apply foundational concepts to actuarial modeling.
2. Demonstrate the ability to communicate actuarial mathematics to an appropriate audience, in written and/or oral form.
- 3, a. Use relevant and current technology to aid the understanding of concepts related to actuarial science or to construct actuarial models.
  - b. Interpret and communicate correctly the results from the technology
4. Demonstrate success in learning mathematical concepts independently.

The SOA and CAS credential professional actuaries through a widely recognized and respected process that involves exams, coursework, and work experience. The Actuarial Science major involves coursework that covers the majority of the syllabi for Exam P/1 (Probability), Exam FM/2 (Financial Mathematics), Exam IFM/3F (Investments and Financial Markets), Exam LTAM (Long Term Actuarial Mathematics), and Exam SRM (Statistics for Risk Modeling). Although not a requirement, students are strongly encouraged to pass at least one if not both of Exams P/1 and FM/2 before graduation. In addition, students can take courses that will lead to credit for all three of the Validation by Educational Experience (VEE) areas required of the SOA and CAS.

**Mathematics Faculty** (p. 40)

**Degree Requirements**

Required Mathematics and Computer Science courses (54 credit hours)

CS 170	Technology in Mathematics	3 cr.
CS 171	Programming for Mathematics	4 cr.
MATH 121	Introductory Probability and Statistics	3 cr.
MATH 127	Calculus I with Pre-Calculus Review	5 cr.
	or	
MATH 133	Calculus I	4 cr.
MATH 134	Calculus II	4 cr.

MATH 221	Introductory Probability & Statistics II	3 cr.
MATH 235	Calculus III	3 cr.
MATH 281	Foundations of Mathematics I	3 cr.
MATH 306	Linear Algebra	3 cr.
MATH 310	Theory of Interest	3 cr.
MATH 372	Probability	3 cr.
MATH 383	Mathematical Statistics	3 cr.
MATH 384	Applied Regression & Time Series	3 cr.
MATH 401	Actuarial Models I	3 cr.
MATH 402	Actuarial Models II	3 cr.
MATH 405	Applied Stochastic Processes	3 cr.
MATH 406	Mathematical Finance	3 cr.

**Subtotal: 54-55**

**Other required courses (6 credits)**

EC 111	Principles of Microeconomics	3 cr.
EC 112	Principles of Macroeconomics	3 cr.

**Subtotal: 6**

**Actuarial Exams and VEE Credits**

The following courses help prepare students for the corresponding SOA or CAS exams. It should be noted that preparing for an exam requires independent study beyond the coursework. For complete topics, consult the exam syllabi as published by the SOA or CAS.

SOA Exam	CAS Exam	Course(s)
Exam P	Exam 1	MATH 372
Exam FM	Exam 2	MATH 310
Exam IFM	Exam 3F	MATH 406
Exam LTAM		MATH 401 & MATH 402
Exam SRM		MATH 383 & MATH 384

The Validation by Educational Experience (VEE) requirement of the SOA and CAS can be obtained by taking the following courses. Although VEE experiences can be completed independently of the exam process, a student needs to have passed at least two exams before applying for VEE credit.

VEE Topic	Courses
Economics	EC 111 & EC 112
Accounting and Finance	AC 101/HONB 203 & FIN 214 & FIN 317 & FIN 320
Mathematical	MATH 383

Statistics

Obtaining a Minor

A student obtaining an Actuarial Science major can complete the requirements for the Mathematical Sciences minor by taking one additional course: MATH 418 or MATH 421. Other minors that pair well with the Actuarial Science major include the Statistics minor, the Computer Science minor, the Economics minor, and the Finance minor.

See the Descriptions of Minor Programs (p. 156) section of the catalogue.

Other Recommended Courses

A student who wishes to use their general electives to obtain additional coursework that supports a career in the actuarial sciences could take any of the following. See the section below on Actuarial Exams and VEE Credits.

AC 101/HONB 203	Financial Reporting I	3 cr.
AC 202	Managerial Accounting	3 cr.
EC 317	Management Issues for Professionals	3 cr.
EC 386	Econometrics	3 cr.
FIN 214	Introduction to Finance	3 cr.
FIN 317	Investments	3 cr.
FIN 318	Security Analysis	3 cr.
FIN 320	Intermediate Corporate Finance	3 cr.
FIN 350	Advanced Corporate Finance	3 cr.

**Subtotal: 27**

Actuarial Science Suggested Sequence of Courses

Degree Requirements

Freshman Year - Fall Semester

ENGL 132	English Composition I	3 cr.
LA 100	First Year Seminar	2 cr.
MATH 127	Calculus I with Pre-Calculus Review	5 cr.
	or	
MATH 133	Calculus I	4 cr.
GUR xxx	General University Requirement	3 cr.
GUR xxx	General University Requirement	3 cr.

**Subtotal: 15-16**

Freshman Year - Spring Semester

CS 170	Technology in Mathematics	3 cr.
ENGL 133	English Composition II	3 cr.
MATH 121	Introductory Probability and Statistics	3 cr.

MATH 134	Calculus II	4 cr.
GUR xxx	General University Requirement	3 cr.
		<b>Subtotal: 16</b>

Sophomore Year - Fall Semester

MATH 221	Introductory Probability & Statistics II	3 cr.
MATH 281	Foundations of Mathematics I	3 cr.
MATH 310	Theory of Interest	3 cr.
GEN XXX	General Elective	3 cr.
EC 111	Principles of Microeconomics	3 cr.
		<b>Subtotal: 15</b>

Sophomore Year - Spring Semester

MATH 235	Calculus III	3 cr.
MATH 372	Probability	3 cr.
CS 171	Programming for Mathematics	4 cr.
EC 112	Principles of Macroeconomics	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 16</b>

Junior Year - Fall Semester

MATH 306	Linear Algebra	3 cr.
MATH 383	Mathematical Statistics	3 cr.
MATH 405	Applied Stochastic Processes	3 cr.
GUR xxx	General University Requirement	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 15</b>

Junior Year - Spring Semester

MATH 384	Applied Regression & Time Series	3 cr.
WIC 2XX	Writing Intensive Course	3 cr.
GUR xxx	General University Requirement	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 15</b>

Senior Year - Fall Semester

MATH 401	Actuarial Models I	3 cr.
GUR xxx	General University Requirement	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 15</b>

Senior Year - Spring Semester

MATH 402	Actuarial Models II	3 cr.
MATH 406	Mathematical Finance	3 cr.

GEN XXX	General Elective	1 cr.
GEN XXX	General Elective	3 cr.
<u>WIC 3XX</u>	<u>Writing Intensive Course</u>	<u>3 cr.</u>

**Subtotal: 13**

\*\*In alternate years, MATH 401-MATH 402, and MATH 406 should be taken in the junior year with MATH 383-MATH 384 and MATH 405 taken in the senior year.

Subtotal: 120-121

Total Credit Hours: 120-121

Note: The order of the General University Requirement courses can be altered (ARTS, CUL, HIST, LAB, LAB/NSP, PH).

American Studies

## American Studies Major

### General Information

American Studies majors take a broad, inter-disciplinary approach to the meaning and nature of culture in the United States including the context of European colonialism—an inquiry that explores the idea of America as a contested site of meaning. Literature is the core of the program, but majors position their literary study in a comparative analysis of visual media and history to supplement their understanding of the relationship between cultural expressions and their context in social, political, and economic change.

### Career Opportunities

Combining a specialization in American culture with emphasis on critical reading, writing, and thinking throughout the course of study, American Studies majors have many opportunities for graduate study and employment. They graduate prepared for the fields of law and politics, technical writing, editing, journalism, and teaching. Students competing for positions specifically focused on American literature or culture will be able to present themselves as specialists in that field. The cultural and historical context of the American Studies program serves majors in business fields reliant on the interpretation of cultural trends and meaning such as marketing and media research, publishing, and public relations.

### English Faculty

#### Program Objectives

- To offer a broad, inter-disciplinary approach to the culture of the United States.
- To provide in-depth exposure to the forms and development of American, including African American, literature situated in the broad Anglophone tradition and history of colonization.
- To analyze film and visual media as a part of the larger American cultural discourse and sharpen students' awareness of the techniques and traditions particular to visual media.
- To supplement students' understanding of literary and visual media with historical context.
- To develop students' ability to read, analyze, and interpret a variety of cultural texts.
- To develop students' ability to produce clear, nuanced, and rhetorically sophisticated academic writing.

### General University and College Requirements

See General University Requirements (p. 33) and College of Arts and Sciences Requirements (p. 41).

## Degree Requirements

Each of the following courses in American Literature and Literary Studies:

ENGL 223	African American Literature I	3 cr.
ENGL 224	African American Literature II	3 cr.
ENGL 251	American Literature I	3 cr.
ENGL 252	American Literature II	3 cr.
ENGL 302	Approaches to the Study of Literature	3 cr.
ENGL 3xx	Topics in American Studies (ENGL 322 or ENGL 357)	3 cr.
ENGL 2xx/3xx	Studies in Transatlantic Culture - ENGL 231, 232, 327, 328 or 341	3 cr.
ENGL 336	Ethnic American Literature	3 cr.
ENGL 338/411	Major Authors	3 cr.
	or	
ENGL 345	Major African American Writers	3 cr.
ENGL 410	English Seminar	3 cr.

**Subtotal: 30**

Any two of the following courses in Film and Media Studies or Communication, one of which must be FILM xxx:

FILM 201	Studies in Mainstream Film Genres	3 cr.
FILM 210	Mass Media in Film	3 cr.
FILM 290	Special Topics in Film	1-3 cr.
FILM 304	Science Fiction Film	3 cr.
FILM 340	Director's Signature	3 cr.
FILM 370	Women and Film	3 cr.
FILM 390 - 393	Special Topics in Film	1-3 cr.
COMM 324	Media Industries, Government, and Society	3 cr.
COMM 326	Race, Gender, and Ethnicity in the Media	3 cr.

**Subtotal: 6**

Any two of the following courses from the Department of History:

HIST 25x	Courses in American History	3 cr.
HIST 35x	Courses in American History	3 cr.

**Subtotal: 6**

Subtotal: 42

## American Studies Suggested Sequence of Courses

### Degree Requirements

Freshman Year - Fall Semester

ENGL 132	English Composition I	3 cr.
LA 110	First Year Seminar Arts & Sciences	3 cr.
MATH 1XX	Mathematical Analysis	3 cr.
GEN XXX	General Elective	3 cr.
CS 13X	Computer Competence	3 cr.

**Subtotal: 15**

Freshman Year - Spring Semester

ENGL 133	English Composition II	3 cr.
MATH 1XX	Mathematical Analysis	3 cr.
PH XXX	Ethical Perspective	3 cr.
GEN XXX	General Elective	3 cr.
HIST XXX	Historical Perspective	3 cr.

**Subtotal: 15**

Sophomore Year - Fall Semester

ENGL XXX	Two literature survey courses from among ENGL 231, 232, 251 or 252	6 cr.
SBP XXX	Social Science Perspective	3 cr.
GEN XXX	General Elective	3 cr.
LAB XXX	Laboratory Science Requirement	3 cr.

**Subtotal: 15**

Sophomore Year - Spring Semester

ENGL XXX	Two literature survey courses from among ENGL 231, 232, 251 or 252	6 cr.
HIST 25x	Courses in American History	3 cr.
GEN XXX	General Elective	3 cr.
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.

**Subtotal: 15**

Junior Year - Fall Semester

ENGL 302	Approaches to the Study of Literature	3 cr.
ENGL 336	Ethnic American Literature	3 cr.
FILM 2xx	One from among FILM 201, 210, 212 or 290	3 cr.
ART XXX	Aesthetic Perspective	3 cr.
CUL XXX	Global Cultures Perspective	3 cr.

**Subtotal: 15**

Junior Year - Spring Semester

ENGL 2xx/3xx	Studies in Transatlantic Culture - ENGL 231, 232, 327, 328 or 341	3 cr.
ENGL 3xx	Topics in American Studies (ENGL 322 or ENGL 357)	3 cr.
FILM/COMM	One from among FILM 340, 390	3 cr.

3xx	or COMM 324, 326	
HIST 35x	Courses in American History	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Senior Year - Fall Semester

ENGL 338/411	Major Authors	3 cr.
	or	
ENGL 345	Major African American Writers	3 cr.
GEN 3XX/4XX	Upper Level General Elective	3 cr.
GEN 3XX/4XX	Upper Level General Elective	3 cr.
GEN 3XX/4XX	Upper Level General Elective	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Senior Year - Spring Semester

ENGL 410	English Seminar	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN 3XX/4XX	Upper Level General Elective	3 cr.

**Subtotal: 15**

Subtotal: 120

Total Credit Hours: 120

Biology

Biology Major

General Information

The Biology curriculum provides students with a strong foundation in the fundamental facts, theories, and principles of biology, experience with the experimental design, instrumentation, and data analysis methods that biologists use in research and practice using the critical reasoning and communication skills required for biologically-oriented graduate programs and professions.

Career Opportunities

Biology graduates are employed as laboratory technicians, product analysts, quality control technicians, and forensic scientists. Others are in research, teaching, or have gone on to graduate or medical schools.

Physical and Biological Faculty (p. 40)

Program Objectives:

1. To demonstrate knowledge of basic structure and functioning of cells.
2. To understand the basic features of the synthetic theory of evolution.
3. To understand basic ecological principles.
4. To understand the principles and mathematical analysis of Mendelian and non-Mendelian inheritance.

- 5. To understand the structure and function of nucleic acids and molecular controls.
- 6. To understand the structure and physiology of animals.
- 7. To understand the structure and physiology of plants.
- 8. To achieve additional understanding in population biology, organismic biology, or cellular and molecular biology.
- 9. To develop quantitative problem solving skills and data analysis.

**General University and College Requirements**

See General University Requirements (p. 33) and College of Arts and Sciences Requirements (p. 41)

**Degree Requirements**

**Required biology courses (34 credit hours)**

BIO 107	General Biology I	3 cr.
BIO 117	General Biology Laboratory I	1 cr.
BIO 108	General Biology II	3 cr.
BIO 118	General Biology Laboratory II	1 cr.
BIO 201	Plant Biology	4 cr.
BIO 213	Ecology	3 cr.
BIO 306	Genetics	4 cr.
BIO 310	Cell Biology	4 cr.
BIO 455	Evolution	3 cr.
BIO 470	Seminar in Biology	1 cr.
BIO 2xx-4xx	Seven additional semester hours of 2xx-4xx BIO courses	7 cr.

**Subtotal: 34**

Additional courses that fulfill the BIO 2xx-4xx requirement: HS 412, HS 315, and HS 320

**Required chemistry courses (16 credit hours)**

CHEM 105	General Chemistry I	4 cr.
CHEM 106	General Chemistry II	4 cr.
CHEM 209	Organic Chemistry I	3 cr.
CHEM 210	Organic Chemistry II	3 cr.
CHEM 219	Organic Chemistry Laboratory I	1 cr.
CHEM 220	Organic Chemistry Laboratory II	1 cr.

**Subtotal: 16**

Twelve to 14 additional credit hours in math, physics, and statistics courses

MATH 109	Precalculus Mathematics	3 cr.
	or	
MATH 123	Calculus I for Management, Life, and Social Sciences	3 cr.
PHYS 123	Physics of the Life Sciences I	4 cr.
	And	
PHYS 124	Physics of the Life Sciences II	4 cr.

	or	
PHYS 101	Elements of Physics	3 cr.
	And	
PHYS 15X	PHYS 15X Elective	3 cr.
	or	
PHYS 110	Physics of the Human Body	3 cr.
	And	
PHYS 15X	PHYS 15X Elective	3 cr.
MATH 121	Introductory Probability and Statistics	3 cr.

**Subtotal: 12-14**

The 2.0 required grade point average in this major is based upon all BIO courses (except for BIO 15x and BIO 19x), as well as CHEM 105/CHEM 106/CHEM 209/CHEM 210/CHEM 219/CHEM 220 and HS 315/HS 320/HS 412 pursued as part of the student's degree program.

Note that no transfer credit is accepted for major-level science lab courses taught online.

Subtotal: 62-64

Total Credit Hours: 62-64

**Biology Suggested Sequence of Courses**

Notes: The suggested sequence of courses in years two, three, and four is an example only. Some offerings for these years will alternate and the exact sequence will require consultation with the faculty and deans.

**Degree Requirements**

**Freshman Year - Fall Semester**

BIO 107	General Biology I	3 cr.
BIO 117	General Biology Laboratory I	1 cr.
CHEM 105	General Chemistry I	4 cr.
ENGL 132	English Composition I	3 cr.
MATH 109	Precalculus Mathematics	3 cr.
	or	
MATH 123	Calculus I for Management, Life, and Social Sciences	3 cr.
LA 100	First Year Seminar	2 cr.

**Subtotal: 16**

**Freshman Year - Spring Semester**

BIO 108	General Biology II	3 cr.
BIO 118	General Biology Laboratory II	1 cr.
CHEM 106	General Chemistry II	4 cr.
ENGL 133	English Composition II	3 cr.
MATH 121	Introductory Probability and Statistics	3 cr.

**Subtotal: 14**

Sophomore Year - Fall Semester		
BIO 213	Ecology	3 cr.
CHEM 209	Organic Chemistry I	3 cr.
CHEM 219	Organic Chemistry Laboratory I	1 cr.
WIC 2XX	Writing Intensive Course	3 cr.
GUR xxx	General University Requirement	3 cr.
		<b>Subtotal: 13</b>

Sophomore Year - Spring Semester		
BIO 201	Plant Biology	4 cr.
CHEM 210	Organic Chemistry II	3 cr.
CHEM 220	Organic Chemistry Laboratory II	1 cr.
GUR xxx	General University Requirement	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 14</b>

Junior Year - Fall Semester		
BIO 2XX/4XX	BIO Elective	3 cr.
GUR xxx	General University Requirement	3 cr.
GEN 3XX	General Elective	3 cr.
WIC 3xx-4xx	Writing Intensive Course	3 cr.
PHYS 101	Elements of Physics	3 cr.
	or	
PHYS 110	Physics of the Human Body	3 cr.
	or	
PHYS 123	Physics of the Life Sciences I	4 cr.
		<b>Subtotal: 15-16</b>

\*If student takes PHYS 123, CS xxx requirement is replaced with GEN xxx.

Junior Year - Spring Semester		
PHYS 15X	PHYS 15X Elective	3 cr.
	or	
PHYS 124	Physics of the Life Sciences II	4 cr.
GUR xxx	General University Requirement	3 cr.
GUR xxx	General University Requirement	3 cr.
GEN 3XX	General Elective	3 cr.
BIO 310	Cell Biology	4 cr.
		<b>Subtotal: 16-17</b>

Senior Year - Fall Semester		
BIO 306	Genetics	4 cr.
GEN 3XX	General Elective	3 cr.
GEN 3XX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.

GUR xxx	General University Requirement	3 cr.
		<b>Subtotal: 16</b>

Senior Year - Spring Semester		
BIO 455	Evolution	3 cr.
BIO 2XX/4XX	BIO Elective	4 cr.
BIO 470	Seminar in Biology	1 cr.
GEN 3XX	General Elective	3 cr.
GEN XXX	General Elective	4 cr.
GEN XXX	General Elective	1 cr.
		<b>Subtotal: 16</b>

Subtotal: 120-122

Total Credit Hours: 120-122

#### Premedical Students:

Biology majors intending to apply to medical school should contact the Chair of the Department of Physical and Biological Sciences or the premed advisor for additional information concerning sequence of courses.

#### Chemistry

#### Chemistry Major

The Chemistry curriculum is designed to provide a sound theoretical background in the principles of chemistry complemented by hands-on laboratory experiences. Students have the opportunity to acquire the chemical knowledge and laboratory skills enabling them to perform synthesis as well as characterize organic and inorganic compounds utilizing chemical, spectrophotometric, chromatographic, and advanced instrumental methods of analysis.

#### Career Opportunities

A baccalaureate degree in chemistry provides graduates with diverse career opportunities and also prepares them for advanced studies in chemistry and related fields. Our graduates are employed as chemical research associates in industrial, governmental, clinical, and environmental settings. Others pursue a career teaching chemistry or in chemical sales. Many of our graduates pursue advanced degrees in chemistry, biochemistry, medical sciences, and other related disciplines.

#### Physical and Biological Faculty (p. 40)

#### Chemistry Major Objectives

Upon completing this program, a Chemistry major will be able to:

1. Perform accurate stoichiometric and chemical equilibrium calculations.
2. Predict and explain the reactivity of an organic or inorganic compound from a knowledge of its structure.
3. Assess the thermodynamic and kinetic stability of a chemical system.
4. Propose a reasonable mechanism for an organic or inorganic reaction.
5. Apply basic quantum mechanical concepts to the study of chemical systems.



6. Synthesize and characterize inorganic and organic compounds.
7. Design and perform a qualitative and quantitative analysis of a sample of matter, using both wet and instrumental methods.
8. Plan and execute experiments through the proper use of library resources.
9. Analyze data statistically and assess reliability of results.
10. Communicate effectively through oral and written reports.

### General University and College Requirements

See General University Requirements (p. 33) and College of Arts and Sciences Requirements (p. 41)

### Degree Requirements

#### Required chemistry courses (41 credit hours)

CHEM 105	General Chemistry I	4 cr.
CHEM 106	General Chemistry II	4 cr.
CHEM 209	Organic Chemistry I	3 cr.
CHEM 210	Organic Chemistry II	3 cr.
CHEM 211	Analytical Methods	3 cr.
CHEM 219	Organic Chemistry Laboratory I	1 cr.
CHEM 220	Organic Chemistry Laboratory II	1 cr.
CHEM 221	Analytical Methods Laboratory	1 cr.
CHEM 312	Instrumental Analysis	3 cr.
CHEM 314	Biochemistry	3 cr.
CHEM 317	Physical Chemistry I	3 cr.
CHEM 318	Physical Chemistry II	3 cr.
CHEM 322	Instrumental Analysis Laboratory	1 cr.
CHEM 324	Biochemistry Laboratory	1 cr.
CHEM 327	Physical Chemistry Laboratory I	1 cr.
CHEM 328	Physical Chemistry Laboratory II	1 cr.
CHEM 421	Inorganic Chemistry	3 cr.
CHEM 431	Inorganic Chemistry Laboratory	1 cr.
CHEM 470	Seminar in Chemistry	1 cr.

**Subtotal: 41**

#### Mathematics and physics courses (19 credit hours)

MATH 133	Calculus I	4 cr.
MATH 134	Calculus II	4 cr.
MATH 235	Calculus III	3 cr.
PHYS 123	Physics of the Life Sciences I	4 cr.
PHYS 124	Physics of the Life Sciences II	4 cr.

**Subtotal: 19**

Subtotal: 60

Total Credit Hours: 60

The 2.0 required grade point average in the major is based upon all CHEM and PHYS courses pursued as a part of the student's degree program.

Note that no transfer credit is accepted for major-level science lab courses taught online.

### Chemistry Suggested Sequence of Courses

Notes: The suggested sequence of courses in years two, three and four is an example only. Some offerings for these years will alternate and the exact sequence will require consultation with the faculty and deans.

### Degree Requirements

#### Freshman Year- Fall Semester

CHEM 105	General Chemistry I	4 cr.
ENGL 132	English Composition I	3 cr.
LA 100	First Year Seminar	2 cr.
MATH 133	Calculus I	4 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 16</b>

#### Freshman Year - Spring Semester

CHEM 106	General Chemistry II	4 cr.
ENGL 133	English Composition II	3 cr.
MATH 134	Calculus II	4 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 17</b>

#### Sophomore Year - Fall Semester

CHEM 209	Organic Chemistry I	3 cr.
CHEM 219	Organic Chemistry Laboratory I	1 cr.
MATH 235	Calculus III	3 cr.
PHYS 123	Physics of the Life Sciences I	4 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 14</b>

#### Sophomore Year - Spring Semester

CHEM 210	Organic Chemistry II	3 cr.
CHEM 220	Organic Chemistry Laboratory II	1 cr.
PHYS 124	Physics of the Life Sciences II	4 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 14</b>

#### Junior Year - Fall Semester

CHEM 211	Analytical Methods	3 cr.
CHEM 221	Analytical Methods Laboratory	1 cr.
GUR xxx	General University Requirement	3 cr.
GUR xxx	General University Requirement	3 cr.

GEN XXX	General Elective	2 cr.
WIC 2XX	Writing Intensive Course	3 cr.

**Subtotal: 15**

Junior Year - Spring Semester

CHEM 312	Instrumental Analysis	3 cr.
CHEM 322	Instrumental Analysis Laboratory	1 cr.
CHEM 314	Biochemistry	3 cr.
CHEM 324	Biochemistry Laboratory	1 cr.
GEN XXX	General Elective	3 cr.
GEN 3XX	General Elective	3 cr.

**Subtotal: 14**

Senior Year - Fall Semester

CHEM 317	Physical Chemistry I	3 cr.
CHEM 327	Physical Chemistry Laboratory I	1 cr.
GUR xxx	General University Requirement	3 cr.
GUR xxx	General University Requirement	3 cr.
GUR xxx	General University Requirement	3 cr.
GEN 3XX	General Elective	3 cr.

**Subtotal: 16**

Senior Year - Spring Semester

CHEM 318	Physical Chemistry II	3 cr.
CHEM 328	Physical Chemistry Laboratory II	1 cr.
CHEM 421	Inorganic Chemistry	3 cr.
CHEM 431	Inorganic Chemistry Laboratory	1 cr.
CHEM 470	Seminar in Chemistry	1 cr.
GEN XXX	General Elective	2 cr.
GEN 3XX	General Elective	3 cr.

**Subtotal: 14**

Subtotal: 120

Total Credit Hours: 120

Communication

**Communication Major**

**General Information**

Students in the Communication major are exposed to the fundamental tenets of several aspects of the field, including interpersonal communication, oral communication, verbal and nonverbal communication, organizational communication, health communication, intercultural communication, and electronically mediated communication. They also learn about different approaches to research and practice within each field.

Students also choose one of three concentrations which will allow them to focus their studies in an area best reflecting their personal interests and professional needs:

1) Media and Journalism, which emphasizes the production, reception, and interpretation of messages via electronic media; the

role of media institutions in society; and the development of journalistic ethics and reporting skills;

2) Public Relations, which emphasizes the construction of messages for public consumption across media and the development of skills to enhance the efficacy of conveying a message clearly and accurately via mass media institutions; or

3) Health Communication, which emphasizes the collection and dissemination of information about health issues on public, institutional, and interpersonal scales.

Students may only major in one concentration; double majoring in two different concentration is prohibited.

**Career Opportunities**

The benefits of a Communication major are manifold. Some graduates of the Communication major continue their education in graduate school or law school. Others work for television or radio broadcast stations, newspapers, public service organizations, hospitals, insurance companies, public relations firms, political campaigns, and other businesses. Our unique partnership with WAMC Northeast Public Radio enables our best students to write, produce, and broadcast news reports at a national level—an excellent springboard for careers in journalism and broadcasting. Students also have an opportunity to produce professional promotional videos for nonprofit organizations through the University’s Institute for Media and Nonprofit Communication. Regardless of the concentration they choose, our graduates tell us that the communication curriculum has helped them not only to develop their writing and speaking skills, but also to handle specialized assignments such as creating questionnaires and conducting interviews that provide useful data for their organizations. In short, they know how to obtain, process, and disseminate information.

Communication Faculty

**Program Objectives**

**Intellectual Range**

1. To enlarge and deepen students’ understanding of human nature as reflected in and affected by various forms of communication.
2. To enlarge and deepen students’ understanding and appreciation of the role of communication in human society and individual life.
3. To deepen students’ understanding of the various forms and media of communication.
4. To enhance students’ understanding of the conditions for both success and failure in communication, as well as abuses of power through communication.
5. To encourage critical reflection on the information and values conveyed by electronic media, as well as their role in society.
6. To encourage critical reflection on the ethical issues that arise in the field of communication.

**Important Communication Skills**

The ability to convey information and to persuade others effectively and efficiently—whether in written, oral, or electronically mediated communication—is of great value in personal, family, professional, and political life. The communication curriculum is designed to achieve the following:

1. To improve students' ability to read, comprehend, and analyze written communication.
2. To improve students' ability to listen to, comprehend, and analyze oral communication.
3. To develop students' ability to design research strategies and to conduct research effectively.
4. To improve students' ability to write clear, grammatically correct, and rhetorically powerful prose.
5. To improve students' ability to communicate nonverbally and to understand the nonverbal communication of others in a variety of situations.
6. To enhance students' abilities to consume, use, and create electronic media technology and products.

**Theoretical and Practical Communication Content**

1. To increase students' knowledge of various theories of communication.
2. To heighten students' awareness of the power of communication.
3. To develop students' capacities as powerful communicators in global society.
4. To enable students to be engaged citizens in an increasingly mediated culture.

**General University and College Requirements**

See General University Requirements (p. 33) and College of Arts and Sciences Requirements (p. 41)

The Communication Major requires 39 credit hours in communication and/or journalism courses.

**Degree Requirements**

All communication majors are required to take the following courses (25 credit hours), in addition to the courses required by their respective concentrations:

COMM 100	Principles of Communication	3 cr.
COMM 102	Introduction to Public Speaking	3 cr.
COMM 205	Mass Communication	3 cr.
COMM 206	Introduction to Communication Research	3 cr.
COMM 245	Video Editing and Production	4 cr.
COMM 300	Communication Theory	3 cr.
MATH 120	Intro Statistics for the Arts & Sciences	3 cr.
	And	
COMM 348	Intercultural Communication	3 cr.
	or	
COMM 356	Global Communication	3 cr.

**Subtotal: 25**

Communication majors concentrating in media and journalism are also required to take the following courses (24 credit hours):

Plus one COMM or JRNL course at the 3xx/4xx level

COMM 251	Video Communication	3 cr.
COMM 352	Multimedia Communication	3 cr.
COMM 371/JRNL 370	Advanced Radio Reporting	3 cr.
JRNL 100	Journalism: Practices and Principles	3 cr.
JRNL 303	Contemporary Journalism	3 cr.
COMM 490	Seminar in Media and Journalism	3 cr.
	And	
COMM 324	Media Industries, Government, and Society	3 cr.
	or	
COMM 326	Race, Gender, and Ethnicity in the Media	3 cr.

**Subtotal: 24**

Communication majors concentrating in public relations are also required to take the following courses (24 credit hours):

Plus one COMM course at the 3xx/4xx level

COMM 280	Organizational Communication	3 cr.
COMM 285	Introduction to Public Relations	3 cr.
COMM 320	Small Group Communication	3 cr.
COMM 328	Health Communication Campaigns	3 cr.
COMM 340	Business Communication	3 cr.
COMM 344	Event Planning	3 cr.
COMM 491	Seminar in PR and Health Communication	3 cr.

**Subtotal: 24**

Communication majors concentrating in health communication are also required to take the following courses (24 credit hours):

Plus one COMM course at the 3xx/4xx level

COMM 283	Health Communication	3 cr.
COMM 285	Introduction to Public Relations	3 cr.
COMM 320	Small Group Communication	3 cr.
COMM 321	Interpersonal Communication	3 cr.
COMM 328	Health Communication Campaigns	3 cr.
COMM 344	Event Planning	3 cr.
COMM 491	Seminar in PR and Health Communication	3 cr.

**Subtotal: 24**

**Communication Concentration in Media and Journalism**

**Degree Requirements**

Freshman Year - Fall Semester

COMM 100	Principles of Communication	3 cr.
CS 13X	Computer Competence	3 cr.
ENGL 132	English Composition I	3 cr.
MATH 1XX	Mathematical Analysis	3 cr.
LA 110	First Year Seminar Arts & Sciences	3 cr.

**Subtotal: 15**

Freshman Year - Spring Semester

COMM 102	Introduction to Public Speaking	3 cr.
ENGL 133	English Composition II	3 cr.
HIST XXX	Historical Perspective	3 cr.
JRNL 100	Journalism: Practices and Principles	3 cr.
MATH 120	Intro Statistics for the Arts & Sciences	3 cr.

**Subtotal: 15**

Sophomore Year - Fall Semester

COMM 205	Mass Communication	3 cr.
COMM 206	Introduction to Communication Research	3 cr.
COMM 245	Video Editing and Production	4 cr.
LAB XXX	Laboratory Science Requirement	3 cr.
PSY/SO XXX	Social Behavioral Perspective	3 cr.

**Subtotal: 16**

Sophomore Year - Spring Semester

ART XXX	Aesthetic Perspective	3 cr.
CUL XXX	Global Cultures Perspective	3 cr.
PH XXX	Ethical Perspective	3 cr.
WIC 2XX	Writing Intensive Course	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Junior Year - Fall Semester

COMM 300	Communication Theory	3 cr.
JRNL 303	Contemporary Journalism	3 cr.
GEN XXX	General Elective	3 cr.
WIC 3xx-4xx	Writing Intensive Course	3 cr.
	And	
COMM 326	Race, Gender, and Ethnicity in the Media	3 cr.
	or	

COMM 348	Intercultural Communication	3 cr.
		<b>Subtotal: 15</b>

Junior Year - Spring Semester

COMM 352	Multimedia Communication	3 cr.
COMM 371/JRNL 370	Advanced Radio Reporting	3 cr.
GEN XXX	General Elective	3 cr.
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.
	And	
COMM 324	Media Industries, Government, and Society	3 cr.
	or	
COMM 356	Global Communication	3 cr.

**Subtotal: 15**

Senior Year - Fall Semester

COMM 490	Seminar in Media and Journalism	3 cr.
COMM 3XX-4XX	COMM Elective	3 cr.
	or	
JRNL 3XX	JRNL Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Senior Year - Spring Semester

GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Subtotal: 121

Total Credit Hours: 121

**Communication Concentration in Public Relations**

**Degree Requirements**

Freshman Year- Fall Semester

COMM 100	Principles of Communication	3 cr.
JRNL 100	Journalism: Practices and Principles	3 cr.
ENGL 132	English Composition I	3 cr.
MATH 1XX	Mathematical Analysis	3 cr.
LA 110	First Year Seminar Arts & Sciences	3 cr.

<b>Subtotal: 15</b>		
Freshman Year - Spring Semester		
COMM 102	Introduction to Public Speaking	3 cr.
ENGL 133	English Composition II	3 cr.
CS XXX	Computer Competence Requirement	3 cr.
HIST XXX	Historical Perspective	3 cr.
MATH 120	Intro Statistics for the Arts & Sciences	3 cr.

**Subtotal: 15**

Sophomore Year - Fall Semester		
COMM 205	Mass Communication	3 cr.
COMM 206	Introduction to Communication Research	3 cr.
COMM 280	Organizational Communication	3 cr.
COMM 285	Introduction to Public Relations	3 cr.
LAB XXX	Laboratory Science Requirement	3 cr.

**Subtotal: 15**

Sophomore Year - Spring Semester		
ART XXX	Aesthetic Perspective	3 cr.
WIC 2XX	Writing Intensive Course	3 cr.
COMM 245	Video Editing and Production	4 cr.
PH XXX	Ethical Perspective	3 cr.
PSY/SO XXX	Social Behavioral Perspective	3 cr.

**Subtotal: 16**

Junior Year - Fall Semester		
COMM 300	Communication Theory	3 cr.
COMM 320	Small Group Communication	3 cr.
COMM 328	Health Communication Campaigns	3 cr.
WIC 3xx-4xx	Writing Intensive Course	3 cr.
	And	
COMM 348	Intercultural Communication	3 cr.
	or	
COMM 3XX	COMM Elective	3 cr.

**Subtotal: 15**

Junior Year - Spring Semester		
COMM 340	Business Communication	3 cr.
COMM 344	Event Planning	3 cr.
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.
CUL XXX	Global Cultures Perspective	3 cr.
	And	
COMM 3XX	COMM Elective	3 cr.

	or	
COMM 356	Global Communication	3 cr.

**Subtotal: 15**

Senior Year - Fall Semester		
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Senior Year - Spring Semester		
COMM 491	Seminar in PR and Health Communication	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Subtotal: 121

Total Credit Hours: 121

## Communication Concentration in Health Communication

### Degree Requirements

Freshman Year- Fall Semester		
COMM 100	Principles of Communication	3 cr.
JRNL 100	Journalism: Practices and Principles	3 cr.
ENGL 132	English Composition I	3 cr.
MATH 1XX	Mathematical Analysis	3 cr.
LA 110	First Year Seminar Arts & Sciences	3 cr.

**Subtotal: 15**

Freshman Year - Spring Semester		
COMM 102	Introduction to Public Speaking	3 cr.
ENGL 133	English Composition II	3 cr.
CS XXX	Computer Competence Requirement	3 cr.
HIST XXX	Historical Perspective	3 cr.
MATH 120	Intro Statistics for the Arts & Sciences	3 cr.

**Subtotal: 15**

Sophomore Year - Fall Semester		
PSY/SO XXX	Social Behavioral Perspective	3 cr.
COMM 205	Mass Communication	3 cr.

COMM 206	Introduction to Communication Research	3 cr.
LAB XXX	Laboratory Science Requirement	3 cr.
COMM 283	Health Communication	3 cr.
		<b>Subtotal: 15</b>

Sophomore Year - Spring Semester

ART XXX	Aesthetic Perspective	3 cr.
COMM 245	Video Editing and Production	4 cr.
COMM 285	Introduction to Public Relations	3 cr.
PH XXX	Ethical Perspective	3 cr.
WIC 2XX	Writing Intensive Course	3 cr.
		<b>Subtotal: 16</b>

Junior Year - Fall Semester

COMM 300	Communication Theory	3 cr.
COMM 328	Health Communication Campaigns	3 cr.
CUL XXX	Global Cultures Perspective	3 cr.
WIC 3xx-4xx	Writing Intensive Course	3 cr.
And		
COMM 348	Intercultural Communication	3 cr.
or		
COMM 3XX	COMM Elective	3 cr.
		<b>Subtotal: 15</b>

Junior Year - Spring Semester

COMM 320	Small Group Communication	3 cr.
COMM 344	Event Planning	3 cr.
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.
GEN XXX	General Elective	3 cr.
And		
COMM 3XX	COMM Elective	3 cr.
or		
COMM 356	Global Communication	3 cr.
		<b>Subtotal: 15</b>

Senior Year - Fall Semester

COMM 321	Interpersonal Communication	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 15</b>

Senior Year - Spring Semester

COMM 491	Seminar in PR and Health	3 cr.
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	Communication	
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 15</b>

Subtotal: 121

Total Credit Hours: 121

Computer Science

### Computer Science Major

#### General Information

The Computer Science major, which leads to a Bachelor of Science degree, is a versatile major that prepares professionals for careers that may require designing and developing software, finding effective solutions to computing problems, or using computers in innovative ways. The program is interdisciplinary in nature and involves coursework in computer science, computer engineering, and mathematics. The program provides a strong background in programming and software development including programming in Python, Java, C/C++, and more. The curriculum concentrates on the scientific, mathematical, and theoretical aspects of the design of computer systems while also developing communication skills through a strong liberal arts curriculum. The program prepares students to work as a software engineer, handling the design and development of user-oriented computer applications and systems. The substantial foundation in mathematics and computer hardware in this program offers students uniqueness and strength in today's job market. There is sufficient flexibility in the curriculum to allow students to pursue additional coursework in software and/or hardware development, mathematics, business, information processing, computer forensics, and information technology. The program has been structured to follow the current recommendations of the Computer Science Curriculum Committee of the Association for Computing Machinery.

#### Opportunities

Graduates of this program develop the creativity and patterns of thought required of computer scientists and are prepared to go on to advanced study or to enter various professional fields. Graduates are well equipped with the analytic training and the knowledge of software and hardware to enter careers in software design, software development, software management, systems programming, systems analysis, technical and software support, and computer consulting. Organizations in business, industry, and the private sector are eager for candidates with the knowledge and skills that the graduates of this program possess.

#### Computer Science and Information Technology Faculty

#### Educational Objectives

The Computer Science program will prepare students to be professionals capable of applying principles to practice, able to undertake lifelong learning, and aware of social, ethical, and environmental issues associated with their professional activities. The expected accomplishments of our graduates during the first several years following graduation from the program are to:

1. Successfully apply principles and practices of computing to develop and maintain software systems that meet customer need.

2. Function ethically and responsibly as a full participant in the computing discipline.
3. Remain current in the fast-changing world of technology today by pursuing lifelong learning.
4. Operate successfully as part of a team.
5. Apply knowledge and skills to the benefit of society.

**Program Outcomes**

Upon completion of the program, the student will have the following abilities:

- Communication—Ability to communicate ideas and concepts in written and oral forms clearly and in an organized manner.
- Mathematical Foundations—Ability to apply knowledge of computing and mathematical concepts and theory to develop and analyze computing systems.
- Teamwork—Ability to work in teams.
- Design—Ability to apply a design process and notation in order to design systems.
- Critical Thinking—Ability to evaluate and analyze a computer-based system, process, component, or program to meet desired needs.
- Ethics—Ability to identify the role computers play in society and identify and analyze ethical impacts of professional behavior and actions.
- Information Management—Ability to identify and utilize appropriate information sources in order to understand and/or solve problems.
- Programming Fundamentals—Ability to create solutions to problems using code and/or components including selection of programming fundamentals and appropriate comments.

**General University and College Requirements**

See General University Requirements and College of Arts and Sciences Requirements

**Degree Requirements**

Required computer science and engineering courses (45 credit hours)

CS 101/IT 101	Introduction to Computing	4 cr.
CS 102/IT 102	Introduction to Programming	4 cr.
CS 200/IT 200	Data Structures	4 cr.
CS 210	Software Design	4 cr.
CS 220	Software Development	4 cr.
CS 351	Programming Languages	3 cr.
CS 364	Design of Database Management Systems	3 cr.
CS 366	Design and Analysis of Algorithms	3 cr.
CS 413	Parallel Computing	3 cr.
CS 490	Software Engineering	3 cr.
CS 492	Computer Science Capstone	3 cr.

CPE 271	Digital System Design	4 cr.
CPE 310	Microprocessors I	3 cr.
		<b>Subtotal: 45</b>

Required mathematics courses (12 -14 credit hours)

MATH 150	Applied Discrete Mathematics	3 cr.
MATH 251	Advanced Discrete Mathematics	3 cr.
MATH 363	Theory of Computation	3 cr.
and one of:		
MATH 120	Intro Statistics for the Arts & Sciences	3 cr.
MATH 121	Introductory Probability and Statistics	3 cr.
MATH 123	Calculus I for Management, Life, and Social Sciences	3 cr.
MATH 127	Calculus I with Pre-Calculus Review	5 cr.
MATH 133	Calculus I	4 cr.
MATH 245	Topics in Linear Algebra and Calculus	3 cr.
MATH 306	Linear Algebra	3 cr.
MATH 379	Graph Theory	3 cr.
		<b>Subtotal: 12-14</b>

Required Philosophy Course (3 credits)

PH 225	Ethics of Digital Technologies	3 cr.
		<b>Subtotal: 3</b>

Technical Elective (6 credit hours).

**Subtotal: 6**

Two additional computer science courses numbered 300 or above, or CPE courses numbered 311 or above, or any of the following IT courses: IT 320, IT 330, IT 350, IT 430, IT 435 and IT 450. Note that only one of the CS 300 or CS 310 may count towards the technical elective requirement.

Subtotal: 66-68

Total Credit Hours: 66-68

The 2.0 required grade point average in the major is based on all computer science, mathematics, computer engineering, information technology and business information systems courses pursued as a part of the student’s degree program.

**Computer Science Suggested Sequence of Courses**

**Degree Requirements**

Freshman Year- Fall Semester

CS 101/IT 101	Introduction to Computing	4 cr.
GEN XXX	General Elective	3 cr.
ENGL 132	English Composition I	3 cr.
LA 100	First Year Seminar	2 cr.

GUR xxx	General University Requirement	3 cr
		<b>Subtotal: 15</b>

Freshman Year - Spring Semester

CS 102/IT 102	Introduction to Programming	4 cr.
MATH 150	Applied Discrete Mathematics	3 cr.
ENGL 133	English Composition II	3 cr.
HIST XXX	History Perspective	3 cr.
GUR xxx	General University Requirement	3 cr
		<b>Subtotal: 16</b>

Sophomore Year - Fall Semester

CS 200/IT 200	Data Structures	4 cr.
GUR xxx	General University Requirement	3 cr
MATH 251	Advanced Discrete Mathematics	3 cr.
WIC 2XX	Writing Intensive Course	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 16</b>

Sophomore Year - Spring Semester

CS 210	Software Design	4 cr.
CS 220	Software Development	4 cr.
GEN XXX	General Elective	1 cr.
MATH 245	Topics in Linear Algebra and Calculus	3 cr.
GUR xxx	General University Requirement	3 cr
		<b>Subtotal: 15</b>

Junior Year - Fall Semester

CS 351	Programming Languages	3 cr.
CS/IT 3XX/4XX	CS Elective	3 cr.
GUR xxx	General University Requirement	3 cr
GEN XXX	General Elective	3 cr.
WIC 3XX	Writing Intensive Course	3 cr.
		<b>Subtotal: 15</b>

Junior Year - Spring Semester

GUR xxx	General University Requirement	3 cr
CS 364	Design of Database Management Systems	3 cr.
CPE 271	Digital System Design	4 cr.
CS/IT 3XX/4XX	CS Elective	3 cr.
PH 225	Ethics of Digital Technologies	3 cr.
		<b>Subtotal: 16</b>

Senior Year - Fall Semester

CS 366	Design and Analysis of Algorithms	3 cr.
CPE 310	Microprocessors I	3 cr.

CS 490	Software Engineering	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 15</b>

Senior Year - Spring Semester

CS 413	Parallel Computing	3 cr.
GEN XXX	General Elective	3 cr.
MATH 363	Theory of Computation	3 cr.
CS 492	Computer Science Capstone	3 cr.
		<b>Subtotal: 12</b>

Subtotal: 120

Total Credit Hours: 120

Note: Order of General University Requirement courses can be altered (HIST, LAB, NSP, SBP, ART, CUL).

The Computer Competence GUR is met through CS 102/IT 102; the Ethical Perspective is met through PH 225.

Creative Writing

Creative Writing Major

**General Information**

The Creative Writing major is intended for students who wish to combine the study of creative writing with the study of literature. Students will gain training in the art of writing within the context of aesthetics, the literary tradition, and a broad liberal arts education. The major offers students a rigorous “apprenticeship” in creative writing, developing students’ understanding of literary forms and tropes, and providing the appropriate background in literary and intellectual history.

**Career Opportunities**

The Creative Writing major will provide an excellent foundation from which students can continue to grow as writers. Because the combination of writing and literature will deal with everything from form and structure to editing to rewriting to critical thinking, Creative Writing graduates will be well-suited for careers in all fields of writing, publishing, editing, advertising, technical writing, and public relations, as well as graduate study.

English Faculty

**Program Objectives**

1. To allow students to see and appreciate their own participation in a great tradition and learn the difference between imitation and innovation by studying the works of great writers and literary techniques so many have used.
2. To increase the student’s ability to read and understand a variety of literary works and to improve the students’ ability to write clear, grammatical, rhetorically effective prose and poetry.
3. To develop the ability to recognize literary techniques in others’ works and to utilize these techniques effectively in their own work.
4. To develop an independent and recognizable artistic “voice” and an increased imaginative capacity.



5. To gain a familiarity with the aspects of the publishing industry most relevant to their work and an experience with the process of submitting works of publishable quality.

### General University and College Requirements

See General University Requirements (p. 33) and College of Arts and Sciences Requirements (p. 41).

### Degree Requirements

The following courses are required for all Creative Writing majors:

ENGL 237	Creative Writing	3 cr.
ENGL 2xx/3xx	Three Literary Period courses, one before 1900	9 crs
ENGL 351	Fiction Workshop	3 cr.
ENGL 352	Poetry Workshop	3 cr.
ENGL 354	Creative Non-Fiction Workshop	3 cr.
ENGL 314	Shakespeare: Plays and Poems	3 cr.
	or	
ENGL 315	Shakespeare: The Tragedies	3 cr.
	or	
ENGL 316	Shakespeare: The Comedies and Histories	3 cr.
	or	
ENGL 338/411	Major Authors	3 cr.
	or	
ENGL 345	Major African American Writers	3 cr.
ENGL XXX	Historically Underrepresented Literature	3 cr.
ENGL xxx	Writing for Web courses-ENGL 270-ENGL 370-ENGL 371	3 cr.
FILM XXX	Film Elective	3 cr.
	or	
ENGL 3XX/4XX	English Elective	3 cr.
ENGL 2xx/3xx/4xx	English-Elective	3 cr.
ENGL 3XX/4XX	English Elective	3 cr.
ENGL 410	English Seminar	3 cr.
ENGL 480	Internship in English	3 cr.
		<b>Subtotal: 45</b>

\* Literary period courses: ENGL 231, ENGL 232, ENGL 251, ENGL 252, ENGL 322, ENGL 327, ENGL 328, ENGL 329, ENGL 353, and ENGL 357. Pre-1900 courses: ENGL 231, ENGL 251, ENGL 322, ENGL 327, and ENGL 328

\*\* Historically underrepresented literature courses: ENGL 223, ENGL 224, ENGL 336, ENGL 341, ENGL 343, and ENGL 345

\*\*\* Writing for the Web courses: ENGL 270, ENGL 370 and ENGL 371.

ENGL 3XX/4XX: With approval of the Department Chair, courses in other departments may be substituted.

Subtotal: 45

Total Credit Hours: 45

### Creative Writing Suggested Sequence of Courses

#### Degree Requirements

#### Freshman Year- Fall Semester

ENGL 132	English Composition I	3 cr.
LA 110	First Year Seminar Arts & Sciences	3 cr.
MATH 1XX	Mathematical Analysis	3 cr.
GEN XXX	General Elective	3 cr.
CS 13X	Computer Competence	3 cr.

**Subtotal: 15**

#### Freshman Year - Spring Semester

ENGL 133	English Composition II	3 cr.
MATH 1XX	Mathematical Analysis	3 cr.
PH XXX	Ethical Perspective	3 cr.
GEN XXX	General Elective	3 cr.
HIST XXX	Historical Perspective	3 cr.

**Subtotal: 15**

#### Sophomore Year - Fall Semester

ENGL 237	Creative Writing	3 cr.
ENGL 2XX	Literary Period course	3 cr.
SBP XXX	Social/Behavioral Sciences Perspective	3 cr.
GEN XXX	General Elective	3 cr.
LAB XXX	Laboratory Science Requirement	3 cr.

**Subtotal: 15**

#### Sophomore Year - Spring Semester

ENGL XXX	Two literary period courses	6 cr.
CUL XXX	Global Cultures Perspective	3 cr.
ART XXX	Aesthetic Perspective	3 cr.
ENGL 3XX/4XX	English Elective (Shakespeare or Major Authors - ENGL 314, 315, 316, 338, 345, 411)	3 cr.

**Subtotal: 15**

#### Junior Year - Fall Semester

ENGL 351	Fiction Workshop	3 cr.
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ENGL 3XX	English Elective	3 cr.
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.
GEN XXX	General Elective	3 cr.
ENGL or FILM XXX	English or Film Elective	3 cr.

**Subtotal: 15**

Junior Year - Spring Semester

ENGL 352	Poetry Workshop	3 cr.
ENGL XXX	Historically Underrepresented Literature	3 cr.
ENGL 270	Writing for the Web	3 cr.
ENGL 480	Internship in English	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Senior Year - Fall Semester

ENGL 354	Creative Non-Fiction Workshop	3 cr.
ENGL 2xx/3xx	English-Elective	3 cr.
GEN 3XX	General Electives	9 cr.

**Subtotal: 15**

Senior Year - Spring Semester

ENGL 410	English Seminar	3 cr.
GEN 3XX	General Elective	3 cr.
GEN XXX	General Electives	9 crs

**Subtotal: 15**

Courses taken to complete the major fulfill the A & S Writing Intensive Requirement.

Subtotal: 120

Total Credit Hours: 120

Criminal Justice

**Criminal Justice Major**

**General Information**

The Bachelor of Science in Criminal Justice program is primarily designed for students who intend to pursue a career in such fields as law enforcement, corrections, probation and parole, court administration, the juvenile justice system, or victim services. The program also provides a solid foundation for students who wish to pursue graduate studies in a variety of disciplines.

**Career Opportunities**

Within the field of criminal justice, there are myriad professional career opportunities. Typical careers of graduates include law enforcement officer positions at the local, state, and federal levels; professional positions in the field of corrections, probation, and parole; positions in court administration and in the juvenile justice system; social work; victim services; and positions as industrial security specialists with major security companies and corporations.

**Criminal Justice Faculty**

**Program Goals and Mission**

The mission of the Bachelor of Science in Criminal Justice program is to help students acquire a higher level of knowledge, understanding, and competencies specific to criminal justice professions. The program specifically focuses on the following goals:

- **Foundation of Knowledge:** Students will develop an understanding of the major concepts, basic and advanced terms, major theories and perspectives, and empirical findings within the discipline.
- **Applications of Knowledge:** Students will develop an understanding of the theoretical perspectives, sociocultural factors, and empirical findings important to policing administering justice in a democratic society.
- **Professional Ethics:** Students will develop an understanding of personal and professional values to function ethically as individuals and professionals in their work environments, as well as their local and global communities.
- **Science:** Students will develop an understanding of important concepts and methodologies within criminal justice, in particular, and the social sciences, more broadly.

In the accomplishment of these goals, the program mission is for students to:

- develop an expansive base of personal and professional knowledge;
- be able to apply board criminal justice knowledge to solve an array of intractable problems encountered in professional settings;
- translate knowledge into informed professional practices; and
- convey knowledge through the delivery of high-quality services that are responsive to the needs of the community and the profession.

**General University and College Requirements**

See General University Requirements (p. 33) and College of Arts and Sciences Requirements (p. 41).

**Degree Requirements**

Required criminal justice courses (24 credit hours)

CJ 101	Introduction to Criminal Justice	3 cr.
CJ 210/SO 210	Criminology	3 cr.
CJ 211	Corrections	3 cr.
CJ 218	Police and Society	3 cr.
CJ 234	The Judicial Process	3 cr.
CJ 315	Research Methods in Criminal Justice	3 cr.
CJ 340	Ethical Decision-Making	3 cr.
CJ 450	Senior Seminar	3 cr.
	or	
CJ 480	Internship in Criminal Justice	1-3 cr.

**Subtotal: 24**

Required criminal justice electives (24 credits)

An additional 24 credit hours in criminal justice courses is required.

Students may elect to pursue a criminal justice concentration.

Students who have chosen an area of concentration are required to complete 12 credit hours within that area and an additional 12 credit hours from upper level justice courses to satisfy their degree requirements.

Students who have chosen two areas of concentration are required to complete 12 credit hours within each selected area for a total of 24 credit hours.

Students who do not declare an area of concentration are required to complete 24 credit hours from upper level criminal justice courses and/or courses listed under the concentration area electives.

CJ 2XX or 3XX	Criminal Justice Elective	3 cr.
CJ 3XX or 4XX	Criminal Justice Elective **	21 crs.
	or	
CJ 2XX or 3XX	Criminal Justice Elective	3 cr.
CJ 3XX or 4XX	Criminal Justice Elective **	9 crs.
CJ 3XX or 4XX	CJ Concentration Area Electives **	12 crs.
		<b>Subtotal: 24</b>

\*\*Fulfills 30 upper level credit hours required.

Subtotal: 48

Total Credit Hours: 48

## Criminal Justice Concentration Area Options

### Degree Requirements

Administration of Justice - Suspend as of 2023-2024

Students who have chosen the administration of justice concentration will complete 12 credits from among the following upper level courses offered within this concentration:

CJ 310	Criminal Law	3 cr.
CJ 312	Criminal Procedure	3 cr.
CJ 322	Evidence	3 cr.
CJ 341	Constitutional Issues in Criminal Justice	3 cr.
CJ 445	Mental Health and the CJS	3 cr.
		<b>Subtotal: 12</b>

### Criminal Investigation

Students who have chosen the criminal investigation concentration will complete 12 credits from among the following upper level courses offered within this concentration:

CJ 310	Criminal Law	3 cr.
CJ 311	Criminal Investigation	3 cr.
CJ 312	Criminal Procedure	3 cr.
CJ 322	Evidence	3 cr.
CJ 341	Constitutional Issues in Criminal Justice	3 cr.
CJ 415	Forensic Science	3 cr.

CJ 420	Criminal Justice Investigation & Exoneration	3 cr.
		<b>Subtotal: 12</b>

### Homeland Security and Terrorism

Students who have chosen the homeland security and terrorism concentration will complete 12 credits from among the following upper level courses offered within this concentration:

CJ 348	Introduction to Cyber Crimes	3 cr.
CJ 360	Introduction to Homeland Security and Terrorism	3 cr.
CJ 362	Counter-terrorism	3 cr.
CJ 363	Weapons of Mass Destruction	3 cr.
CJ 375	Emergency Response Management	3 cr.
CJ 430	Human Trafficking	3 cr.
CJ 440	Immigration and Crime	3 cr.
		<b>Subtotal: 12</b>

### Victim Studies

Students who have chosen the victim studies concentration will complete 12 credits from among the following upper level courses offered within this concentration:

CJ 303	Victimology	3 cr.
CJ 304	Child Abuse and Neglect	3 cr.
CJ 343/SO 343	Domestic Violence	3 cr.
CJ 353	Violence Against Women	3 cr.
CJ 425	Problem Analysis in Victim Studies	3 cr.
CJ 430	Human Trafficking	3 cr.
CJ 445	Mental Health and the CJS	3 cr.
		<b>Subtotal: 12</b>

Subtotal: 12

Total Credit Hours: 12

## Criminal Justice Suggested Sequence of Courses

### Degree Requirements

#### Freshman Year- Fall Semester

CJ 101	Introduction to Criminal Justice	3 cr.
SO 101	Introduction to Sociology	3 cr.
ENGL 132	English Composition I	3 cr.
MATH 1XX	Mathematical Analysis	3 cr.
LA 100	First Year Seminar	2 cr.
LA XXX	ST: First Year Extended	1 cr.
		<b>Subtotal: 15</b>

#### Freshman Year - Spring Semester

HIST XXX	Historical Perspective	3 cr.
CJ 218	Police and Society	3 cr.

ENGL 133	English Composition II	3 cr.
ART XXX	Aesthetic Perspective	3 cr.
	And	
PSY 101	Introduction to Psychology	3 cr.
	or	
CJ 2XX	Criminal Justice Elective	3 cr.

**Subtotal: 15**

Sophomore Year - Fall Semester

CJ 211	Corrections	3 cr.
GEN XXX	General Elective	3 cr.
LAB XXX	Laboratory Science Requirement	3 cr.
CJ 210/SO 210	Criminology	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Sophomore Year - Spring Semester

CUL XXX	Global Cultures Perspective	3 cr.
CJ 234	The Judicial Process	3 cr.
CJ 2XX or 3XX	Criminal Justice Elective	3 cr.
MATH XXX	Mathematical Analysis	3 cr.
NSP	Natural Science Perspective	3 cr.

**Subtotal: 15**

Junior Year - Fall Semester

CJ 3XX or 4XX	Criminal Justice Elective	3 cr.
CJ 315	Research Methods in Criminal Justice	3 cr.
GEN XXX	General Elective	3 cr.
CS 131	Computing for the Arts and Sciences	3 cr.
	or	
CS 133	Introduction to Informatics	3 cr.
PH XXX	Ethical Perspective	3 cr.

**Subtotal: 15**

Junior Year - Spring Semester

GEN XXX	General Elective	3 cr.
CJ 340	Ethical Decision-Making	3 cr.
CJ 3XX or 4XX	Criminal Justice Elective	3 cr.
GEN XXX	General Elective	3 cr.
WIC 3xx-4xx	Writing Intensive Course	3 cr.

**Subtotal: 15**

Senior Year - Fall Semester

CJ 3XX or 4XX	Criminal Justice Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.

CJ 3XX or 4XX	Criminal Justice Elective	3 cr.
	And	
CJ 480	Internship in Criminal Justice	1-3 cr.
	or	
CJ 450	Senior Seminar	3 cr.

**Subtotal: 15**

Senior Year - Spring Semester

CJ 3XX or 4XX	Criminal Justice Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
CJ 3XX	Criminal Justice Elective	3 cr.

**Subtotal: 15**

Subtotal: 120

Total Credit Hours: 120

Notes:

1. CJ 210/SO 210 - Criminology will also satisfy the 200 level writing intensive course (WIC)
2. CJ 480 Internship in Criminal Justice will satisfy the CJ 450 Senior Seminar requirement.

Economics

**Economics Major**

**General Information**

The objective of the Economics major is to provide students with the analytical tools that enable them to think for themselves, not only about economics, but also about the world around them. Courses range from traditional, such as Money and Banking or International Trade, to the analytical such as Microeconomics or Macroeconomics. Some courses feature hands-on experience with econometric software packages. The senior seminar provides experience in supervised research and delivery of an oral presentation.

**Career Opportunities**

Employment opportunities are available in the private, public, and nonprofit sectors. Typical employment might be in banking, consulting, private sector management, or government.

Graduates are well positioned for graduate work in economics, law, business, and public administration. Those pursuing graduate in economics work can expect to find advanced position in industry and government as well teaching positions at colleges and universities.

**Economics Faculty**

**Program Objectives**

1. To provide a thorough understanding of economic theory.
2. To apply economic theory to the analysis of a variety of social, political, and business issues.
3. To develop students' ability to think creatively and independently about a variety of social, political, and business issues.

4. To apply critical thinking and problem solving skills to developing solutions to problems at the level of an individual decision making unit like a business firm or a nonprofit organization.
5. To apply critical thinking and problem solving skills to developing solutions to problems at the level of the nation or the world.

### General University and College Requirements

See General University Requirements (p. 33) and College of Arts and Sciences Requirements (p. 41).

### Degree Requirements

Required economics and mathematics courses (21 credit hours):

EC 111	Principles of Microeconomics	3 cr.
EC 112	Principles of Macroeconomics	3 cr.
EC 215	Intermediate Macroeconomics	3 cr.
EC 216	Intermediate Microeconomics	3 cr.
EC 490	Seminar: Issues in Contemporary Economics	3 cr.
	And	
MATH 120	Intro Statistics for the Arts & Sciences	3 cr.
MATH 123	Calculus I for Management, Life, and Social Sciences	3 cr.
		<b>Subtotal: 21</b>

Fifteen additional credit hours:

with at least 12 selected from 300 level economics courses.

**Subtotal: 15**

Three credit hours of political science.

POSC XXX	Political Science	3 cr.
		<b>Subtotal: 3</b>

(Also satisfies the Social and Behavioral Science Perspective.)

Subtotal: 39

Total Credit Hours: 39

The 2.0 required grade point average in the major is based upon all EC courses pursued as a part of the student's degree program.

### Economics Suggested Sequence of Courses

Please note: Students who join the Department of Economics at the beginning of their sophomore year can begin taking their major requirement then and complete the program without academic sacrifice.

### Degree Requirements

Freshman Year- Fall Semester

EC 111	Principles of Microeconomics	3 cr.
MATH 120	Intro Statistics for the Arts & Sciences	3 cr.

LA 100	First Year Seminar	2 cr.
CS 13X	Computer Competence	3 cr.
ENGL 132	English Composition I	3 cr.

**Subtotal: 14**

Freshman Year - Spring Semester

EC 112	Principles of Macroeconomics	3 cr.
ENGL 133	English Composition II	3 cr.
PH XXX	Ethical Perspective	3 cr.
HIST XXX	Historical Perspective	3 cr.
MATH 123	Calculus I for Management, Life, and Social Sciences	3 cr.

**Subtotal: 15**

Sophomore Year - Fall Semester

EC 215	Intermediate Macroeconomics	3 cr.
LAB XXX	Laboratory Science Requirement	3 cr.
CUL XXX	Cultural/Aesthetic Perspective	3 cr.
POSC XXX	Social Science Requirement	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Sophomore Year - Spring Semester

EC 216	Intermediate Microeconomics	3 cr.
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.
WIC 2XX	Writing Intensive Course	3 cr.
PSY XXX	Behavioral Science Requirement	3 cr.
EC 2XX/3XX	Economics Elective	3 cr.
GEN XXX	General Elective	1 cr.

**Subtotal: 16**

Junior Year - Fall Semester

EC 3XX/4XX	Economic Elective	3 cr.
EC 3XX/4XX	Economic Elective	3 cr.
WIC 3xx-4xx	Writing Intensive Course	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Junior Year - Spring Semester

EC 3XX/4XX	Economic Elective	3 cr.
GEN XXX	General Elective	3 cr.
SBP XXX	Social/Behavioral Sciences Perspective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Senior Year - Fall Semester			
EC 3XX/4XX	Economic Elective		3 cr.
GEN XXX	General Elective		3 cr.
GEN XXX	General Elective		3 cr.
GEN XXX	General Elective		3 cr.
SBP XXX	Behavioral Science Requirement		3 cr.
			<b>Subtotal: 15</b>

Senior Year - Spring Semester			
EC 490	Seminar: Issues in Contemporary Economics		3 cr.
GEN XXX	General Elective		3 cr.
GEN XXX	General Elective		3 cr.
GEN XXX	General Elective		3 cr.
GEN XXX	General Elective		3 cr.
			<b>Subtotal: 15</b>

Subtotal: 120

Total Credit Hours: 120

Note: A one-credit course must be taken at some point during the four-year sequence.

Education

*Elementary Education Majors*

**General Information**

The Education major offers students the professional preparation essential for becoming an effective teacher in the 21st century. Coursework and field-based experiences are designed to meet the regulations and guidelines mandated by the Massachusetts Department of Elementary and Secondary Education (DESE). Through active participation in classes on campus and numerous assignments completed in area schools (K-12), future teachers learn how to plan curriculum to meet needs of all learners, effectively build and manage a classroom community, and implement and analyze assessments to foster learning for all students. Campus and field-based assignments are designed to support students in acquiring skills and knowledge needed to demonstrate professional skills outlined in the Professional Standards for Teaching (PSTs). Students also learn how to use the MA Curriculum Frameworks as a key reference for lesson planning.

In order to participate in and complete an Education major leading to endorsement for an initial license in Massachusetts, students must successfully complete all of the following criteria:

**Declare a Major** for registration eligibility in ED coursework, program tracking in Self-Service, access to ED courses and monitored advising throughout an ED curriculum leading to licensure. Declaring an ED major is not a guarantee of acceptance; full acceptance to an ED major occurs in spring junior year if all departmental criteria are met.

**Elementary:** Double major in Elementary Education and one of the following content majors: English, History, Math, or Psychology.

**Secondary content majors:** Biology, Chemistry, English, History, or Math. Follow specified ED curriculum for your major/double major

as outlined in University catalog and advising sheets. Any substitutions to outlined curriculum must be approved via ED Department waiver.

**Apply to the Education Department** for admission to continue in coursework and field-based experiences required for licensure; applications available in Emerson (G100C) and ED Department Kodiak class.

**Meet with ED faculty each semester** for progress monitoring and advising.

**Complete prepracticum (field-based) experiences and gateway assessment assignments** to specified standards demonstrating content knowledge, teaching skills (implementation of WNE lesson template), and professional dispositions. Field experiences take place in local schools, you will experience different settings (urban and suburban) and different grade levels within the license area you seek.

Preprac 1: LA 110\*\*/ ED 120  
10 hours

\*if Elementary Education section of LA 110 is not taken, student must take ED 100 (new course)

Preprac 2: ED 351 (elementary)/ ED 202 (secondary): 25 hours  
Gateway #1—peer microteaching

Preprac 3 ED 376 (elementary)/ED 366 (secondary) 25 hours

Gateway #2 —K-12 microteaching

**Earn a minimum cumulative GPA of at least 2.8** overall, 2.8 in your content major, and 2.8 in preliminary education courses; earn a minimum 'C' in all ED classes.

**Take and pass the Massachusetts Tests for Educator Licensure (MTEL)** required for licensure area before Spring Break in junior year.

Students successfully completing all criteria listed above will be eligible to complete the student teaching block in Fall of senior year; be fully admitted to the Education department.

Students unable to meet all criteria will be counseled out of an ED major and may complete the ED minor, graduating in their content major.

\* Any requested changes to above requirements must be addressed through an ED Department waiver.

Due the demands of completing an Education major, students who transfer into the University, or change majors while on campus, may not be able to graduate in four years.

The Massachusetts Department of Elementary and Secondary Education (DESE) has accredited all of the University's teacher preparation programs through a formal review process grounded in the Massachusetts Professional Standards for Teaching and Subject Matter Knowledge guidelines. Upon graduation students are eligible to be endorsed by the University for an Initial Teaching License in Massachusetts. Students apply directly to DESE for their teaching license.

Students planning to teach in other states should meet with a member of the Education Department, or look at the Department of Education

website for the state in question, to learn about specific requirements. Massachusetts participates with every state and the District of Columbia through the National Association of State Directors of Teacher Education and Certification (NASDTEC) Interstate Agreement to accept a candidates' state approved educator preparation program. The interstate agreement does not exempt candidates from degree, testing, and/or prerequisite requirements, this information is available on state department of education websites.

Education handbooks are available online on the Education Department website:  
<http://www1.wne.edu/arts-and-sciences/departments/education/index.cfm>

Education handbooks, prepracticum assignments, MTEL resources, lesson planning resources are available in the Education Department Kodiak class.

Students who completed a licensure major in the academic year 2020-2021, had a 100% pass rate on all Massachusetts Tests for Educator Licensure (MTEL).

### Education Faculty

#### Elementary Teacher Education

Students preparing for an Elementary Teaching license must select a major in one of the prescribed liberal arts and sciences disciplines (English, History, Math, Psychology, or Sociology) and complete the Elementary Education major; they are completing a double major. Students can complete the University's General University requirements, the College of Arts and Sciences requirements, and the elementary education major in four years with the following majors: English, History, Mathematics, Sociology, and Psychology. Elementary majors begin their educator preparation in LA 100 (students must take ED 120 if the Education section of LA 110 is not completed).

A student should file an application with the Education Department by the end of their first year (application available in EG 100C), or immediately upon transfer to an ED major. A student will be fully accepted, and eligible for the student teaching block by Spring Break of junior year, if all criteria listed above are successfully met. Students may be counseled out of the major at any advising meeting due to low GPA, lack of progress on MTELS, or demonstrated lack of professional dispositions. Credits earned toward the Education major (leads to licensure) may be applied to the Education minor (not a path to licensure) if a student is unable to meet all requirements for completing the Elementary Education major.

Minimum eligibility requirements for completing the Elementary Education major are listed in advising handouts available from ED faculty.

Students are required to meet individually at least once a semester with an Education faculty member to review prepracticum feedback and participation, progress in meeting gateway assessments, major coursework assignments, and confirm passed MTEL status before a student teaching placement will be assigned. Students may be counseled out of an ED major for not meeting all criteria, academic performance, or demonstrated lack of professional dispositions. All ED majors complete a minimum of eighty-five hours of prepracticum experiences, and a minimum of three hundred hours as a student teacher in local elementary schools.

Students meeting all stated criteria are automatically eligible for the practicum semester (Fall of senior year). The practicum semester includes an integrated methods course, elementary classroom participation (grades 1-6), and a student teaching seminar. The

Candidate Assessment of Performance (CAP) system is used throughout the practicum semester. CAP is designed around the PSTs as outlined by DESE. Working collaboratively, the student teacher (candidate), the supervising practitioner (cooperating teacher) and University supervisor (WNE ED faculty) gather data, and analyze evidence of ability and effectiveness implementing the PSTs.

Currently the University's Education Program offers students the opportunity to prepare for the Massachusetts Initial License, which is valid for five years of employment. The Massachusetts Professional License is then required of graduates and involving completion of a Performance Assessment Program or an appropriate master's degree program, and three years of employment under the license.

Required courses for students enrolled in the Elementary Education major: LA 110 (with ED faculty or ED 120), ED 201, ED 252, ED 275, ED 350, ED 351, ED 365, ED 375, ED 376 ED 425, ED 479, and ED 480.

Students should plan on taking only ED 425, ED 479, and ED 480 in Fall of senior year (total of 15 credits). ED 479 requires full-time student teaching off campus.

### Elementary Education Major Suggested Sequence of Courses

(Major XXX - See catalogue for course requirements of second major)

#### Degree Requirements

##### Freshman Year - Fall Semester

ENGL 132	English Composition I	3 cr.
MATH 107	Mathematics For Elementary Education I	3 cr.
HIST 111	United States History to 1877	3 cr.
PSY 101	Introduction to Psychology	3 cr.
PEHR 163	Games Children Play	1 cr.
LA 110	First Year Seminar Arts & Sciences	3 cr.

**Subtotal: 16**

\*IF LA 110 not taken with ED department, must take ED 120

##### Freshman Year - Spring Semester

ENGL 133	English Composition II	3 cr.
MATH 108	Mathematics for Elementary Education II	3 cr.
HIST 112	United States History, 1878 to the Present	3 cr.
POSC 102	American National Government	3 cr.
MAJOR XXX	(Psychology majors take PSY 207)	3 cr.

**Subtotal: 15**

10 hours Pre-Practicum

Communication and Literary Skills MTEL recommended in Spring semester.

Sophomore Year - Fall Semester			
ED 350	Reading and Language Arts: Theory and Methods	3 cr.	
ED 351	Elementary Prepracticum I	1 cr.	
HIST 205	World History, Prehistory-1500CE	3 cr.	
LAB XXX	Laboratory Science	3 cr.	
ENGL xxx	ENGL-course-from-among-ENGL-237-240-249-336-370-371	3 cr.	
MAJOR XXX	See catalogue for courses in major	3 cr.	

**Subtotal: 16**

Sophomore Year - Spring Semester			
ED 375	Humanities, Science and Mathematics Methods	3 cr.	
ED 252	Survey of Geography	1 cr.	
ED 376	Elementary Prepracticum II	1 cr.	
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.	
HIST 206	World History, 1500CE-Present	3 cr.	
ED 365	Special Education: Principles & Practices	3 cr.	
MAJOR XXX	See catalogue for courses in major	3 cr.	

**Subtotal: 17**

Foundations of Reading and/ General Curriculum MTEL encouraged in this year.

Junior Year - Fall Semester			
CS 132	Principles of Computing	3 cr.	
ENGL 339	Children's and Young Adult Literature	3 cr.	
EC 111	Principles of Microeconomics	3 cr.	
MAJOR XXX	See catalogue for courses in major	3 cr.	
MAJOR XXX	See catalogue for courses in major	3 cr.	
MAJOR XXX	See catalogue for courses in major	3 cr.	

**Subtotal: 18**

Junior Year - Spring Semester			
PH XXX	Ethical Perspective	3 cr.	
ED 201	Principles and Problems of Education	3 cr.	
MAJOR XXX	See catalogue for courses in major	3 cr.	
MAJOR XXX	See catalogue for courses in major	3 cr.	

	major		
ED 275	Teaching English Language Learners	3 cr.	
MAJOR XXX	See catalogue for courses in major	3 cr.	

**Subtotal: 18**

All MTEL tests must be passed by Spring Break.

Senior Year - Fall Semester			
ED 425	Infusing Curriculum with Arts, Health, and Technology	3 cr.	
ED 479	Elementary Teaching Practicum	9 cr.	
ED 480	Elementary Practicum Seminar	3 cr.	

**Subtotal: 15**

Senior Year - Spring Semester			
CUL XXX	Global Cultures Perspective	3 cr.	
XXX	Aesthetics Perspective, choose one: ART 101, 201, 202, 205, 225, THTR 110, MUS 101, 120, 230, 240, FILM 102, 103, 201, 210	3 cr.	
MAJOR XXX	See catalogue for courses in major	3 cr.	
MAJOR XXX	See catalogue for courses in major	3 cr.	
MAJOR XXX	See catalogue for courses in major	3 cr.	

**Subtotal: 15**

Subtotal: 130

Total Credit Hours: 130

Major xxx slots identify where courses required by content major are taken.

\*Two courses in the curriculum must be designated "Writing Intensive."

### Elementary Education BA in the Mathematical Sciences, Teacher Preparation-Elementary School Suggested Sequence of Courses

#### Degree Requirements

The typical course schedule for the Bachelor of Arts degree in the Mathematical Sciences, teacher preparation-elementary education, would be constructed as indicated below.

Mathematical Sciences Teacher Preparation - Elementary School			
CS 170	Technology in Mathematics	3 cr.	
MATH 107	Mathematics For Elementary Education I	3 cr.	
MATH 108	Mathematics for Elementary Education II	3 cr.	



MATH 121	Introductory Probability and Statistics	3 cr.
MATH 133	Calculus I	4 cr.
MATH 134	Calculus II	4 cr.
MATH 235	Calculus III	3 cr.
MATH 281	Foundations of Mathematics I	3 cr.
MATH 371	Modern Aspects of Geometry	3 cr.
MATH 375	Creative Problem Solving	3 cr.
MATH 377	Elementary Number Theory	3 cr.
MATH 451	Senior Project I	1 cr.
MATH 452	Senior Project II	2 cr.

**Subtotal: 38**

Subtotal: 38

**Suggested Sequence of Courses**

Freshman Year - Fall Semester

ENGL 132	English Composition I	3 cr.
MATH 133	Calculus I	4 cr.
HIST 111	United States History to 1877	3 cr.
PSY 101	Introduction to Psychology	3 cr.
LA 110	First Year Seminar Arts & Sciences	3 cr.
PEHR 163	Games Children Play	1 cr.

**Subtotal: 17**

Freshman Year - Spring Semester

ENGL 133	English Composition II	3 cr.
MATH 134	Calculus II	4 cr.
HIST 206	World History, 1500CE-Present	3 cr.
POSC 102	American National Government	3 cr.
CS 170	Technology in Mathematics	3 cr.
PEHR 163	Games Children Play	1 cr.

**Subtotal: 17**

First attempt on Communication and Literacy Skills MTEL is encouraged in Spring Semester.

Sophomore Year - Fall Semester

ED 350	Reading and Language Arts: Theory and Methods	3 cr.
LAB XXX	Laboratory Science	3 cr.
MATH 235	Calculus III	3 cr.
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.
ED 351	Elementary Prepracticum I	1 cr.
MATH 107	Mathematics For Elementary Education I	3 cr.

**Subtotal: 16**

Sophomore Year - Spring Semester

ED 275	Teaching English Language Learners	3 cr.
ED 375	Humanities, Science and Mathematics Methods	3 cr.
ED 376	Elementary Prepracticum II	1 cr.
MATH 121	Introductory Probability and Statistics	3 cr.
ENGL xxx	ENGL-course-from-among-ENGL-237-240-249-336-370-371	3 cr.
MATH 108	Mathematics for Elementary Education II	3 cr.

**Subtotal: 16**

First attempts on Foundations of Reading and/or Elementary Subject Matter MTEL are encouraged in this year.

Junior Year - Fall Semester

ED 365	Special Education: Principles & Practices	3 cr.
EC 111	Principles of Microeconomics	3 cr.
HIST 112	United States History, 1878 to the Present	3 cr.
MATH 107	Mathematics For Elementary Education I	3 cr.
ENGL 339	Children's and Young Adult Literature	3 cr.
MATH 281	Foundations of Mathematics I	3 cr.

**Subtotal: 18**

Junior Year - Spring Semester

PH XXX	Ethical Perspective	3 cr.
ED 201	Principles and Problems of Education	3 cr.
MATH 371	Modern Aspects of Geometry	3 cr.
	or	
MATH 377	Elementary Number Theory	3 cr.
	And	
MATH 375	Creative Problem Solving	3 cr.
HIST 205	World History, Prehistory-1500CE	3 cr.
ED 252	Survey of Geography	1 cr.

**Subtotal: 13-16**

All MTEL tests must be passed at this point.

Senior Year - Fall Semester

ED 425	Infusing Curriculum with Arts, Health, and Technology	3 cr.
ED 479	Elementary Teaching Practicum	9 cr.
ED 480	Elementary Practicum Seminar	3 cr.

MATH 451	Senior Project I	1 cr.
		<b>Subtotal: 16</b>
<b>Senior Year - Spring Semester</b>		
CUL XXX	Global Cultures Perspective	3 cr.
XXX	Aesthetics Perspective, choose one: ART 101, 201, 202, 205, 225, THTR 110, MUS 101, 120, 230, 240, FILM 102, 103, 201, 210	3 cr.
MATH 371	Modern Aspects of Geometry	3 cr.
	or	
MATH 377	Elementary Number Theory	3 cr.
	And	
MATH 375	Creative Problem Solving	3 cr.
MATH 452	Senior Project II	2 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 14-17</b>

Subtotal: 127-133

- MATH 371 and MATH 377 are offered in alternate spring semesters, so either MATH 371 or MATH 377 will be taken in the spring semester of the junior year, and the other will be taken in the spring semester of the senior year.

*Secondary Teacher Education Majors*

After successful completion of all Education department requirements, students may be endorsed for an initial license in Massachusetts in grades 5-12 for English and history, and grades 8-12 in biology, chemistry and mathematics.

Students can complete the University’s General University requirements, the College of Arts and Sciences requirements, and the Secondary Education requirements in four years with the following content majors: Biology, Chemistry, English, History, or Mathematics. Secondary majors begin their educator preparation in ED 120.

A student should file an application with the Education Department by the end of their first year (application available in EG 101) or immediately upon transfer to an ED major. A student will be fully accepted during the spring semester of junior year if all criteria listed above are successfully met. Students may be counseled out of the major at any advising meeting due to low GPA, lack of progress on MTELS, or demonstrated lack of professional dispositions. Credits earned toward the Education major (leads to licensure) may be applied to the Education minor (not a path to licensure) if a student is unable to meet all requirements for completing Secondary Education requirements.

Minimum eligibility requirements for completing a Secondary Education major are listed below, and in advising handouts available from ED faculty.

Students are required to meet individually at least once a semester with an Education faculty member to review prepracticum feedback and participation, progress in meeting gateway assessments, major coursework assignments, and confirm passed MTEL status before a

student teaching placement will be assigned. Students may be counseled out of an ED major for not meeting all criteria, academic performance, or demonstrated lack of professional dispositions. All ED majors complete a minimum of eighty-five hours of prepracticum experiences, and a minimum of three hundred hours as a student teacher in local schools.

Students meeting all stated criteria are automatically eligible for the practicum semester (fall of senior year). The practicum semester includes a methods course, secondary classroom participation, and a student teaching seminar. The Candidate Assessment of Performance (CAP) system is used throughout the practicum semester. CAP is designed around the PSTs as outlined by DESE. Working collaboratively, the student teacher (candidate), the supervising practitioner (cooperating teacher), and University supervisor (WNE ED faculty) gather data, and analyze evidence of ability to implement the PSTs. We work as a team mentoring students to become professional, effective teachers.

Currently the University’s Education Program offers students the opportunity to prepare for the Massachusetts Initial License, which is valid for five years of employment. The Massachusetts Professional License is then required of graduates and involves completion of a Performance Assessment Program or an appropriate master’s degree program, and three years of employment under the license.

Required courses for students enrolled in a Secondary Education major: ED 120, ED 201, ED 202, ED 275, ED 361/ED 362 or ED 363, ED 365, ED 366, ED 403, ED 409, and ED 410.

Students should plan on taking only ED 403, ED 409, and ED 410 in fall of their senior year (total of 15 credits). ED 409 requires full-time student teaching off campus.

**Secondary Education Biology Major Suggested Sequence of Courses**

**Degree Requirements**

**Freshman Year - Fall Semester**

BIO 107	General Biology I	3 cr.
BIO 117	General Biology Laboratory I	1 cr.
CHEM 105	General Chemistry I	4 cr.
ENGL 132	English Composition I	3 cr.
LA 110	First Year Seminar Arts & Sciences	3 cr.
	And	
MATH 109	Precalculus Mathematics	3 cr.
	or	
MATH 123	Calculus I for Management, Life, and Social Sciences	3 cr.

**Subtotal: 16**

**Freshman Year - Spring Semester**

BIO 108	General Biology II	3 cr.
BIO 118	General Biology Laboratory II	1 cr.
CHEM 106	General Chemistry II	4 cr.

ENGL 133	English Composition II	3 cr.
MATH 121	Introductory Probability and Statistics	3 cr.
ED 120	Introduction to Education	2 cr.

**Subtotal: 16**

## Sophomore Year - Fall Semester

BIO 213	Ecology	3 cr.
CHEM 209	Organic Chemistry I	3 cr.
CHEM 219	Organic Chemistry Laboratory I	1 cr.
WIC 2XX	Writing Intensive Course	3 cr.
PSY 101	Introduction to Psychology	3 cr.
HIST XXX	Historical Perspective	3 cr.

**Subtotal: 16**

## Sophomore Year - Spring Semester

ED 201	Principles and Problems of Education	3 cr.
ED 202	Secondary Prepracticum I	1 cr.
BIO 201	Plant Biology	4 cr.
CHEM 210	Organic Chemistry II	3 cr.
CHEM 220	Organic Chemistry Laboratory II	1 cr.
ED 275	Teaching English Language Learners	3 cr.

**Subtotal: 15**

## Junior Year - Fall Semester

BIO 306	Genetics	4 cr.
CUL XXX	Global Cultures Perspective	3 cr.
BIO 2XX	Biology Elective	4 cr.
ART XXX	Aesthetic Perspective	3 cr.
PHYS 101	Elements of Physics	3 cr.
	or	
PHYS 123	Physics of the Life Sciences I	4 cr.

**Subtotal: 17-18**

## Junior Year - Spring Semester

ED 363	Methods for Sciences 5-12	1 cr.
ED 365	Special Education: Principles & Practices	3 cr.
BIO 310	Cell Biology	4 cr.
ED 366	Secondary Prepracticum II	1 cr.
ENGL 339	Children's and Young Adult Literature	3 cr.
CS 132	Principles of Computing	3 cr.

**Subtotal: 15**

## Senior Year - Fall Semester

ED 403	Methods of Teaching in	3 cr.
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## Secondary Schools

ED 409	Practicum in Secondary Teaching	9 cr.
ED 410	Secondary Practicum Seminar	3 cr.

**Subtotal: 15**

## Senior Year - Spring Semester

BIO 470	Seminar in Biology	1 cr.
BIO 2XX	Biology Elective	4 cr.
PH XXX	Ethical Perspective	3 cr.
BIO 455	Evolution	3 cr.
	And	
PHYS 15X	PHYS 15X Elective	3 cr.
	or	
PHYS 124	Physics of the Life Sciences II	4 cr.

**Subtotal: 14-15**

Subtotal: 124-126

Total Credit Hours: 124-126

## Secondary Education Chemistry Major Suggested Sequence of Courses

## Degree Requirements

## Freshman Year- Fall Semester

CHEM 105	General Chemistry I	4 cr.
ENGL 132	English Composition I	3 cr.
LA 110	First Year Seminar Arts & Sciences	3 cr.
MATH 133	Calculus I	4 cr.
CS 132	Principles of Computing	3 cr.

**Subtotal: 17**

## Freshman Year - Spring Semester

CHEM 106	General Chemistry II	4 cr.
ENGL 133	English Composition II	3 cr.
MATH 134	Calculus II	4 cr.
ED 120	Introduction to Education	2 cr.
HIST XXX	Historical Perspective	3 cr.

**Subtotal: 16**

## Sophomore Year - Fall Semester

CHEM 209	Organic Chemistry I	3 cr.
CHEM 211	Analytical Methods	3 cr.
CHEM 219	Organic Chemistry Laboratory I	1 cr.
CHEM 221	Analytical Methods Laboratory	1 cr.
MATH 235	Calculus III	3 cr.
PHYS 123	Physics of the Life Sciences I	4 cr.

**Subtotal: 15**

## Sophomore Year - Spring Semester

CHEM 210	Organic Chemistry II	3 cr.
CHEM 220	Organic Chemistry Laboratory II	1 cr.
CHEM 312	Instrumental Analysis	3 cr.
CHEM 322	Instrumental Analysis Laboratory	1 cr.
ED 202	Secondary Prepracticum I	1 cr.
ED 275	Teaching English Language Learners	3 cr.
PHYS 124	Physics of the Life Sciences II	4 cr.

**Subtotal: 16**

Junior Year - Fall Semester

CHEM 317	Physical Chemistry I	3 cr.
CHEM 327	Physical Chemistry Laboratory I	1 cr.
PH XXX	Ethical Perspective	3 cr.
CUL XXX	Global Cultures Perspective	3 cr.
PSY 101	Introduction to Psychology	3 cr.
WIC 2XX	Writing Intensive Course	3 cr.
ED 202	Secondary Prepracticum I	1 cr.
ED 363	Methods for Sciences 5-12	1 cr.

**Subtotal: 18**

Junior Year - Spring Semester

CHEM 318	Physical Chemistry II	3 cr.
CHEM 328	Physical Chemistry Laboratory II	1 cr.
CHEM 314	Biochemistry	3 cr.
CHEM 324	Biochemistry Laboratory	1 cr.
ED 365	Special Education: Principles & Practices	3 cr.
ED 366	Secondary Prepracticum II	1 cr.
ENGL 339	Children's and Young Adult Literature	3 cr.
ED 363	Methods for Sciences 5-12	1 cr.

**Subtotal: 16**

Senior Year - Fall Semester

ED 403	Methods of Teaching in Secondary Schools	3 cr.
ED 409	Practicum in Secondary Teaching	9 cr.
ED 410	Secondary Practicum Seminar	3 cr.

**Subtotal: 15**

Senior Year - Spring Semester

GEN XXX	General Elective	3 cr.
ART XXX	Aesthetic Perspective	3 cr.
CHEM 421	Inorganic Chemistry	3 cr.
CHEM 431	Inorganic Chemistry Laboratory	1 cr.
CHEM 470	Seminar in Chemistry	1 cr.

ED 201	Principles and Problems of Education	3 cr.
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**Subtotal: 14**

Subtotal: 127

Total Credit Hours: 127

Secondary Education English Major Suggested Sequence of Courses

Degree Requirements

Freshman Year - Fall Semester

ENGL 132	English Composition I	3 cr.
LA 110	First Year Seminar Arts & Sciences	3 cr.
MATH 1XX	Mathematical Analysis	3 cr.
PSY 101	Introduction to Psychology	3 cr.
CS 132	Principles of Computing	3 cr.

**Subtotal: 15**

Freshman Year - Spring Semester

ENGL 133	English Composition II	3 cr.
MATH 1XX	Mathematical Analysis	3 cr.
PH XXX	Ethical Perspective	3 cr.
HIST XXX	Historical Perspective	3 cr.
ED 120	Introduction to Education	2 cr.

**Subtotal: 14**

Sophomore Year - Fall Semester

ENGL 232	British Literature II	3 cr.
ENGL 252	American Literature II	3 cr.
ENGL 249	Tutoring Practicum: Writing and Grammar	3 cr.
ART XXX	Aesthetic Perspective	3 cr.
	And	
ENGL 214	World Literature I	3 cr.
	or	
ENGL 215	World Literature II	3 cr.

**Subtotal: 15**

Sophomore Year - Spring Semester

ENGL 231	British Literature I	3 cr.
ENGL 251	American Literature I	3 cr.
ED 201	Principles and Problems of Education	3 cr.
ED 275	Teaching English Language Learners	3 cr.
LAB XXX	Laboratory Science Requirement	3 cr.
ED 202	Secondary Prepracticum I	1 cr.

**Subtotal: 16**

Junior Year - Fall Semester

ENGL 3XX/4XX	Focus Literature Period	3 cr.
ENGL 3XX/4XX	English Elective	3 cr.
ENGL 354	Creative Non-Fiction Workshop	3 cr.
ENGL 302	Approaches to the Study of Literature	3 cr.
	And	
ENGL 270	Writing for the Web	3 cr.
	or	
ENGL 370	Writing about TV and Film	3 cr.
	or	
ENGL 371	Narrative and Digital Media	3 cr.
		<b>Subtotal: 15</b>

Junior Year - Spring Semester

CUL XXX	Global Cultures Perspective	3 cr.
ENGL 339	Children's and Young Adult Literature	3 cr.
ED 361	Methods for Humanities 5-12	1 cr.
ED 365	Special Education: Principles & Practices	3 cr.
ENGL 411/338	Major Authors	3 cr.
ENGL 270	Writing for the Web	3 cr.
	or	
ENGL 370	Writing about TV and Film	3 cr.
	or	
ENGL 371	Narrative and Digital Media	3 cr.
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.
ED 366	Secondary Prepracticum II	1 cr.
		<b>Subtotal: 17</b>

Senior Year - Fall Semester

ED 403	Methods of Teaching in Secondary Schools	3 cr.
ED 409	Practicum in Secondary Teaching	9 cr.
ED 410	Secondary Practicum Seminar	3 cr.
		<b>Subtotal: 15</b>

Senior Year - Spring Semester

ENGL 410	English Seminar	3 cr.
ENGL XXX	Historically Underrepresented Literature	3 cr.
CUL XXX	Global Cultures Perspective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Courses taken to complete the major fulfill the A & S Writing Intensive Requirement.  
Subtotal: 122

Total Credit Hours: 122

Secondary Education History Major Suggested Sequence of Courses

Degree Requirements

Freshman Year - Fall Semester

HIST 205	World History, Prehistory-1500CE	3 cr.
HIST 111	United States History to 1877	3 cr.
MATH 1XX	Mathematics	3 cr.
ENGL 132	English Composition I	3 cr.
LA 110	First Year Seminar Arts & Sciences	3 cr.
		<b>Subtotal: 15</b>

Freshman Year - Spring Semester

HIST 206	World History, 1500CE-Present	3 cr.
HIST 112	United States History, 1878 to the Present	3 cr.
MATH 1XX	Mathematical Analysis	3 cr.
PSY 101	Introduction to Psychology	3 cr.
ENGL 133	English Composition II	3 cr.
ED 120	Introduction to Education	2 cr.
		<b>Subtotal: 17</b>

Sophomore Year - Fall Semester

POSC 102	American National Government	3 cr.
EC 111	Principles of Microeconomics	3 cr.
LAB XXX	Laboratory Science Requirement	3 cr.
CUL XXX	Global Cultures Perspective	3 cr.
HIST 289	Sophomore Methods Seminar	3 cr.
		<b>Subtotal: 15</b>

Sophomore Year - Spring Semester

SO 101	Introduction to Sociology	3 cr.
CS 132	Principles of Computing	3 cr.
ED 201	Principles and Problems of Education	3 cr.
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.
ED 275	Teaching English Language Learners	3 cr.
ED 202	Secondary Prepracticum I	1 cr.
		<b>Subtotal: 16</b>

Junior Year - Fall Semester

PH XXX	Ethical Perspective	3 cr.
HIST 3XX	Upper Level History Elective	3 cr.
HIST 3XX	Upper Level History Elective	3 cr.
ART XXX	Aesthetic Perspective	3 cr.
GEOG 1xx	World Geography Elective	3 cr.

**Subtotal: 15**

Junior Year - Spring Semester

HIST 3XX	Upper Level History Elective	3 cr.
HIST 3XX	Upper Level History Elective	3 cr.
HIST xxx	History Elective	3 cr.
ED 361	Methods for Humanities 5-12	1 cr.
ED 365	Special Education: Principles & Practices	3 cr.
ENGL 339	Children's and Young Adult Literature	3 cr.
ED 366	Secondary Prepracticum II	1 cr.

**Subtotal: 17**

Senior Year - Fall Semester

ED 403	Methods of Teaching in Secondary Schools	3 cr.
ED 409	Practicum in Secondary Teaching	9 cr.
ED 410	Secondary Practicum Seminar	3 cr.

**Subtotal: 15**

Senior Year - Spring Semester

HIST 3XX	Upper Level History Elective	3 cr.
HIST 3XX	Upper Level History Elective	3 cr.
GEN XXX	General Elective	3 cr.
HIST 490	Junior and Senior Seminar in History	4 cr.

**Subtotal: 13**

\* Two courses must be designated as writing intensive.

Subtotal: 123

Total Credit Hours: 123

Secondary Education Mathematical Sciences Major Suggested Sequence of Courses

Degree Requirements

See Bachelor of Science in the Mathematical Sciences, Teacher Preparation - Secondary School, Suggested Sequence of Courses (p. 69)

Freshman Year - Fall Semester

MATH 133	Calculus I	4 cr.
ENGL 132	English Composition I	3 cr.
HIST XXX	Historical Perspective	3 cr.
LA 110	First Year Seminar Arts &	3 cr.

Sciences

LAB XXX	Laboratory Science Requirement	3 cr.
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**Subtotal: 16**

Freshman Year - Spring Semester

MATH 134	Calculus II	4 cr.
ENGL 133	English Composition II	3 cr.
CS 170	Technology in Mathematics	3 cr.
GEN XXX	General Elective	3 cr.
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.

**Subtotal: 16**

Sophomore Year - Fall Semester

MATH 235	Calculus III	3 cr.
MATH 281	Foundations of Mathematics I	3 cr.
PSY 101	Introduction to Psychology	3 cr.
ART XXX	Aesthetic Perspective	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Sophomore Year - Spring Semester

MATH 121	Introductory Probability and Statistics	3 cr.
GEN XXX	General Elective	2 cr.
CS 171	Programming for Mathematics	4 cr.
ED 120	Introduction to Education	2 cr.
ED 275	Teaching English Language Learners	3 cr.

**Subtotal: 14**

Junior Year - Fall Semester

MATH 306	Linear Algebra	3 cr.
MATH 418	Introduction to Modern Algebra	3 cr.
MATH XXX	Mathematics Elective	3 cr.
PH XXX	Ethical Perspective	3 cr.
WIC 2XX	Writing Intensive Course	3 cr.
ED 202	Secondary Prepracticum I	1 cr.

**Subtotal: 16**

Junior Year - Spring Semester

MATH 421	Real Analysis	3 cr.
MATH 371	Modern Aspects of Geometry	3 cr.
ED 201	Principles and Problems of Education	3 cr.
ED 362	Methods for Mathematics 5-12	1 cr.
ED 365	Special Education: Principles & Practices	3 cr.
ED 366	Secondary Prepracticum II	1 cr.

ENGL 339	Children's and Young Adult Literature	3 cr.
		<b>Subtotal: 17</b>

## Senior Year - Fall Semester

MATH 451	Senior Project I	1 cr.
ED 403	Methods of Teaching in Secondary Schools	3 cr.
ED 409	Practicum in Secondary Teaching	9 cr.
ED 410	Secondary Practicum Seminar	3 cr.
		<b>Subtotal: 16</b>

## Senior Year - Spring Semester

MATH 452	Senior Project II	2 cr.
MATH 377	Elementary Number Theory	3 cr.
MATH 375	Creative Problem Solving	3 cr.
CUL XXX	Global Cultures Perspective	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 14</b>

MATH 375 and MATH 377 are typically offered together in alternate spring semesters, and MATH 371 is offered in the other alternate spring semester. They can be taken in either order.  
Subtotal: 124

Total Credit Hours: 124

## English

## English Major

**General Information**

English majors at Western New England University learn to write and speak effectively as they develop awareness of the ethical, moral, cultural, historical, and social issues that are embedded in both traditional and underrepresented literatures. They graduate prepared to enter a variety of academic, educational, corporate, or government settings. Furthermore, as they analyze texts and develop skills in reasoning, conducting research, and formulating clear arguments, they broaden their perspectives, increase their intellectual curiosity and aesthetic appreciation, and identify themselves as active, lifetime learners.

**Career Opportunities**

Because English majors graduate with writing, speaking, and analytical skills that have been developed through four years, they are highly desirable job applicants in a number of areas. Our graduates have been successfully employed in primary and secondary schools, in writing-centered professions, and in a variety of business settings. Some have continued their studies in English or communications, completing master's and doctoral degrees. Law schools look for English majors because they want students who have learned how to think critically, articulate their ideas clearly, and summarize complex issues succinctly. English is a perfect major for those hoping to complete the University's 3+3 Law program (which enables students to complete both undergraduate and law degrees in six years). A number of our majors have received law degrees and are now practicing that profession.

Writing skills can lead directly to employment in a number of other fields, including journalism, public relations, and technical writing. Many newspaper and magazine editors say they look for English majors because they have been taught how to write for various audiences. Many companies are hiring English majors for technical writing jobs because English majors are taught how to translate ideas and instructions into language that a general audience can understand. Grant writers are needed in all areas: for academic research, political foundations, and corporate development. The English degree can create significant opportunities in the world of professional writing when coupled with an internship or two.

Additionally, many businesses seek to hire English majors for entry-level positions because they are capable learners who have highly developed analytic skills, broad backgrounds, and excellent communication skills.

**English Faculty****Program Objectives**

The English faculty engage students in learning experiences structured to help them develop the following:

**Flexibility and Good Judgment**

Our students learn to recognize and appreciate different experiences, other cultures, and new points of view. They also learn to examine evidence carefully and to make informed value judgments.

**Breadth of Perspective and Depth of Knowledge**

Our students examine the literature of different eras and cultures, relating the creative representation of human society in literature to the broader contexts of history, philosophy, and cultural change. They also deepen and enrich their understanding of at least one literary tradition and are encouraged to pursue more advanced study in particular areas of interest.

**Ability to Analyze and Synthesize**

Our students use critical thinking to analyze texts and situations, breaking them down into manageable "pieces." They also seek patterns, make significant connections, and reconnect the parts they analyze into meaningful wholes.

**Ability to Learn and to Share Learning**

Our students gather, value, and synthesize information in their effort to understand literary works and cultural trends. They also learn the rhetorical skill necessary to present what they learn to others, to share their learning instead of simply "collecting" it.

**Self-confidence and Self-assessment**

Our students are encouraged to be creative, to use their imaginations, and to take chances. They also receive rigorous critical feedback and are encouraged to apply high standards to everything they do. To learn, one must let go of the idea that one knows everything already. Understanding that, we seek to establish a learning environment that is both fun and serious.

**Technological Comfort and Technological Questioning**

Our students learn to be comfortable with computers, with word-processing software, and with the process of writing and thinking "on the computer." But they are also encouraged to question the value and necessity of new technologies and their applications—and to have alternatives on hand if the technology crashes.

**Problem-solving and Problem Recognition**

Our students learn how to solve problems, to interpret new situations, and to “make sense” of complexity. They also learn how to recognize problems, even in areas that are not usually questioned. We aim to help students recognize assumptions made by institutions and cultures, to question and reassess those value judgments for themselves, and to take an active role in reshaping them.

**General University and College Requirements**

See General University Requirements (p. 33) and College of Arts and Sciences Requirements (p. 41).

**Degree Requirements**

The following classes are required for all English Majors:

ENGL 2xx/3xx	Three Literary Period courses, one before 1900	9 crs
ENGL 302	Approaches to the Study of Literature	3 cr.
ENGL 314	Shakespeare: Plays and Poems	3 cr.
	or	
ENGL 315	Shakespeare: The Tragedies	3 cr.
	or	
ENGL 316	Shakespeare: The Comedies and Histories	3 cr.
	or	
ENGL 338/411	Major Authors	3 cr.
	or	
ENGL 345	Major African American Writers	3 cr.
ENGL XXX	Historically Underrepresented Literature	3 cr.
ENGL XXX	Any upper division writing course	3 cr.
FILM XXX	Film Elective	3 cr.
ENGL 2xx/3xx	English-Elective	3 cr.
ENGL 3XX	English Elective	3 cr.
ENGL 3XX	English Elective	3 cr.
ENGL 3XX	English Elective	3 cr.
ENGL 410	English Seminar	3 cr.
ENGL 480	Internship in English	3 cr.

**Subtotal: 42**

\* Literary period courses: ENGL 231, ENGL 232, ENGL 251, ENGL 252, ENGL 322, ENGL 327, ENGL 328, ENGL 329, ENGL 353, and ENGL 357: Pre-1900 courses, ENGL 231, ENGL 251, ENGL 322, ENGL 327 and ENGL 328.

\*\* Historically underrepresented literature courses: ENGL 223, ENGL 224, ENGL 336, ENGL 341, ENGL 343, and ENGL 345

\*\*\* Upper division writing courses: ENGL 270, ENGL 351, ENGL 352, ENGL 354, ENGL 370 and ENGL 371.

Subtotal: 42

Total Credit Hours: 42

**English Suggested Sequence of Courses**

**Degree Requirements**

**Freshman Year - Fall Semester**

ENGL 132	English Composition I	3 cr.
LA 110	First Year Seminar Arts & Sciences	3 cr.
MATH 1XX	Mathematical Analysis	3 cr.
GEN XXX	General Elective	3 cr.
CS 13X	Computer Competence	3 cr.

**Subtotal: 15**

**Freshman Year - Spring Semester**

ENGL 133	English Composition II	3 cr.
MATH 1XX	Mathematical Analysis	3 cr.
PH XXX	Ethical Perspective	3 cr.
GEN XXX	General Elective	3 cr.
HIST XXX	Historical Perspective	3 cr.

**Subtotal: 15**

**Sophomore Year - Fall Semester**

ENGL XXX	Two literary period courses	6 cr.
SBP XXX	Social Science Perspective	3 cr.
ART XXX	Aesthetic Perspective	3 cr.
LAB XXX	Laboratory Science Requirement	3-4 cr.

**Subtotal: 15-16**

**Sophomore Year - Spring Semester**

ENGL XXX	Literary Period course	3 cr.
GEN XXX	General Elective	3 cr.
CUL XXX	Global Cultures Perspective	3 cr.
FILM XXX	Film Elective	3 cr.
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.

**Subtotal: 15**

**Junior Year - Fall Semester**

ENGL 302	Approaches to the Study of Literature	3 cr.
ENGL XXX	Historically Underrepresented Literature	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
ENGL 2xx/3xx	English-Elective	3 cr.

**Subtotal: 15**

**Junior Year - Spring Semester**

ENGL XXX	Any upper division writing course	3 cr.
ENGL 314	Shakespeare: Plays and Poems	3 cr.



	or		
ENGL 315	Shakespeare: The Tragedies	3 cr.	
	or		
ENGL 316	Shakespeare: The Comedies and Histories	3 cr.	
	or		
ENGL 338/411	Major Authors	3 cr.	
	or		
ENGL 345	Major African American Writers	3 cr.	
ENGL 3XX	English Elective	3 cr.	
ENGL 480	Internship in English	3 cr.	
GEN XXX	General Elective	3 cr.	

**Subtotal: 15****Senior Year - Fall Semester**

ENGL 3XX	English Elective	3 cr.	
GEN 3XX	General Elective	3 cr.	
GEN 3XX	General Elective	3 cr.	
GEN XXX	General Elective	3 cr.	
GEN XXX	General Elective	3 cr.	

**Subtotal: 15****Senior Year - Spring Semester**

ENGL 410	English Seminar	3 cr.	
ENGL 3XX	English Elective	3 cr.	
GEN 3XX	General Elective	3 cr.	
GEN XXX	General Elective	3 cr.	
GEN 3XX	General Elective	3 cr.	

**Subtotal: 15**

Subtotal: 120-121

Total Credit Hours: 120-121

Courses taken to complete the major fulfill the A & S Writing Intensive Requirement.

Forensics

**Forensic Biology Major****General Information**

The Forensic Biology curriculum is designed to provide the student with a solid background in the scientific principles that underlie forensic techniques. Skills are acquired through coursework augmented by practical laboratory experience.

**Career Opportunities**

A baccalaureate degree in Forensic Biology provides diverse opportunities for employment as forensic scientists or as laboratory analysts, as well as for advanced training in forensics and related fields.

**Physical and Biological Faculty****Forensic Biology Objectives:**

To demonstrate

1. Knowledge of basic structure and functioning of cells.
2. To understand the principles and mathematical analysis of Mendelian and non-Mendelian inheritance.
3. To understand the structure and function of nucleic acids and molecular controls.
4. To collect and preserve forensic evidence using established protocol.
5. Plan and perform analyses of both biological and non-biological forensic evidence.
6. Apply chemical, physical, and biological principles to the design of procedures for the analysis of forensic evidence.
7. Communicate clearly and effectively the results and reliability of an analysis of forensic evidence.
8. Demonstrate ability to function as an ethical member of the criminal justice system.

**General University and College Requirements**

See General University Requirements (p. 33) and College of Arts and Sciences Requirements (p. 41).

**Degree Requirements**

Required Science courses: (75-77 credit hours)

BIO 107	General Biology I	3 cr.
BIO 117	General Biology Laboratory I	1 cr.
BIO 108	General Biology II	3 cr.
BIO 118	General Biology Laboratory II	1 cr.
BIO 401	Molecular Biology	4 cr.
BIO 306	Genetics	4 cr.
BIO 203	Microbiology	4 cr.
BIO 310	Cell Biology	4 cr.
CHEM 105	General Chemistry I	4 cr.
CHEM 106	General Chemistry II	4 cr.
CHEM 209	Organic Chemistry I	3 cr.
CHEM 210	Organic Chemistry II	3 cr.
CHEM 211	Analytical Methods	3 cr.
CHEM 221	Analytical Methods Laboratory	1 cr.
CHEM 219	Organic Chemistry Laboratory I	1 cr.
CHEM 220	Organic Chemistry Laboratory II	1 cr.
CHEM 314	Biochemistry	3 cr.
CHEM 324	Biochemistry Laboratory	1 cr.
FS 201	Introduction to Forensics	4 cr.
FS 240	Scientific Evidence	3 cr.
FS 310	Crime Scene Processing	3 cr.
FS 425	Criminalistics I	4 cr.
FS 426	Criminalistics II	4 cr.

FS 480	Internship in Forensic Chemistry and Forensic Biology	1-3 cr.
	or	
FS 333	Independent Study in Forensic Science	1-3 cr.
	or	
FS 440	Undergraduate Research	1-3 cr.
	And	
PHYS 123	Physics of the Life Sciences I	4 cr.
PHYS 124	Physics of the Life Sciences II	4 cr.

**Subtotal: 75-77**

Required courses in Math, Ethics, and Criminal Justice

MATH 123	Calculus I for Management, Life, and Social Sciences	3 cr.
MATH 121	Introductory Probability and Statistics	3 cr.
CJ 101	Introduction to Criminal Justice	3 cr.
PH 208	Ethics	3 cr.

**Subtotal: 12**

Subtotal: 87-89

Total Credit Hours: 87-89

The 2.0 required grade point average in the major will be based upon all BIO, CHEM, and FS courses pursued as a part of the student's degree program

Note that no transfer credit is accepted for major-level science lab courses taught online.

### Forensic Biology Suggested Sequence of Courses

Notes:

The suggested sequence of courses in years two, three, and four is an example only. Some offerings for these years will alternate and the exact sequence will require consultation with the faculty and deans.

### Degree Requirements

Freshman Year - Fall Semester

BIO 107	General Biology I	3 cr.
BIO 117	General Biology Laboratory I	1 cr.
CHEM 105	General Chemistry I	4 cr.
ENGL 132	English Composition I	3 cr.
LA 100	First Year Seminar	2 cr.
MATH 123	Calculus I for Management, Life, and Social Sciences	3 cr.

**Subtotal: 16**

Freshman Year - Spring Semester

BIO 108	General Biology II	3 cr.
BIO 118	General Biology Laboratory II	1 cr.
CHEM 106	General Chemistry II	4 cr.

CJ 101	Introduction to Criminal Justice	3 cr.
ENGL 133	English Composition II	3 cr.
MATH 121	Introductory Probability and Statistics	3 cr.

**Subtotal: 17**

Sophomore Year - Fall Semester

CHEM 209	Organic Chemistry I	3 cr.
CHEM 219	Organic Chemistry Laboratory I	1 cr.
FS 201	Introduction to Forensics	4 cr.
GEN XXX	General Elective	3 cr.
PH 208	Ethics	3 cr.

**Subtotal: 14**

Sophomore Year - Spring Semester

GUR xxx	General University Requirement	3 cr.
BIO 203	Microbiology	4 cr.
CHEM 210	Organic Chemistry II	3 cr.
CHEM 220	Organic Chemistry Laboratory II	1 cr.
GEN XXX	General Elective	3 cr.
FS 240	Scientific Evidence	3 cr.

**Subtotal: 17**

Junior Year - Fall Semester

BIO 306	Genetics	4 cr.
FS 310	Crime Scene Processing	3 cr.
PHYS 123	Physics of the Life Sciences I	4 cr.
CHEM 211	Analytical Methods	3 cr.
CHEM 221	Analytical Methods Laboratory	1 cr.

**Subtotal: 15**

Junior Year - Spring Semester

BIO 310	Cell Biology	4 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	1 cr.
PHYS 124	Physics of the Life Sciences II	4 cr.

**Subtotal: 15**

Senior Year - Fall Semester

BIO 401	Molecular Biology	4 cr.
GUR xxx	General University Requirement	3 cr.
GUR xxx	General University Requirement	3 cr.
FS 425	Criminalistics I	4 cr.

**Subtotal: 14**

Senior Year - Spring Semester

FS 426	Criminalistics II	4 cr.
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FS 333	Independent Study in Forensic Science	1-3 cr.
	or	
FS 480	Internship in Forensic Chemistry and Forensic Biology	1-3 cr.
	or	
FS 440	Undergraduate Research	1-3 cr.
CHEM 314	Biochemistry	3 cr.
CHEM 324	Biochemistry Laboratory	1 cr.
GEN 3XX	General Elective	3 cr.

**Subtotal: 12-14**

Subtotal: 120-122

Total Credit Hours: 120-122

## Forensic Chemistry Major

### General Information

The Forensic Chemistry curriculum is designed to provide the student with a solid background in the chemical principles that underlie forensic techniques. Skills are acquired through coursework augmented by practical laboratory experience.

### Career Opportunities

A baccalaureate degree in Forensic Chemistry provides diverse opportunities for employment as forensic scientists or as laboratory analysts, as well as for advanced training in forensics and related fields.

### Physical and Biological Faculty

#### Forensic Chemistry Objectives:

1. Perform accurate stoichiometric and chemical equilibrium calculations.
2. Predict and explain the reactivity of an organic or inorganic compound from a knowledge of its structure.
3. Assess the thermodynamic and kinetic stability of a chemical system.
4. Propose a reasonable mechanism for an organic or inorganic reaction.
5. Apply basic quantum mechanical concepts to the study of chemical systems.
6. Synthesize and characterize inorganic and organic compounds.
7. Design and perform a qualitative and quantitative analysis of a sample of matter, using both wet and instrumental methods.
8. Plan and execute experiments through the proper use of library resources.
9. Analyze data statistically and assess reliability of results.
10. Communicate effectively through oral and written reports.
11. Collect and preserve forensic evidence using established protocol.
12. Plan and perform analyses of both biological and non-biological forensic evidence.

13. Apply chemical, physical, and biological principles to the design of procedures for the analysis of forensic evidence.

14. Communicate clearly and effectively the results and reliability of an analysis of forensic evidence.

15. Demonstrate ability to function as an ethical member of the criminal justice system.

### General University and College Requirements

See General University Requirements (p. 33) and College of Arts and Sciences Requirements (p. 41).

## Degree Requirements

Required Science courses: (70 - 72 credit hours)

BIO 107	General Biology I	3 cr.
BIO 117	General Biology Laboratory I	1 cr.
CHEM 105	General Chemistry I	4 cr.
CHEM 106	General Chemistry II	4 cr.
CHEM 209	Organic Chemistry I	3 cr.
CHEM 210	Organic Chemistry II	3 cr.
CHEM 219	Organic Chemistry Laboratory I	1 cr.
CHEM 220	Organic Chemistry Laboratory II	1 cr.
CHEM 211	Analytical Methods	3 cr.
CHEM 221	Analytical Methods Laboratory	1 cr.
CHEM 312	Instrumental Analysis	3 cr.
CHEM 322	Instrumental Analysis Laboratory	1 cr.
CHEM 314	Biochemistry	3 cr.
CHEM 324	Biochemistry Laboratory	1 cr.
CHEM 402	Toxicology	3 cr.
CHEM 421	Inorganic Chemistry	3 cr.
CHEM 431	Inorganic Chemistry Laboratory	1 cr.
CHEM 317	Physical Chemistry I	3 cr.
CHEM 327	Physical Chemistry Laboratory I	1 cr.
FS 201	Introduction to Forensics	4 cr.
FS 240	Scientific Evidence	3 cr.
FS 310	Crime Scene Processing	3 cr.
FS 425	Criminalistics I	4 cr.
FS 426	Criminalistics II	4 cr.
FS 333	Independent Study in Forensic Science	1-3 cr.
	or	
FS 480	Internship in Forensic Chemistry and Forensic Biology	1-3 cr.
	or	
FS 440	Undergraduate Research	1-3 cr.
	And	

PHYS 123	Physics of the Life Sciences I	4 cr.
PHYS 124	Physics of the Life Sciences II	4 cr.

**Subtotal: 70-72**

Required courses in Math, Ethics, and Criminal Justice

MATH 121	Introductory Probability and Statistics	3 cr.
MATH 133	Calculus I	4 cr.
MATH 134	Calculus II	4 cr.
CJ 101	Introduction to Criminal Justice	3 cr.
PH 208	Ethics	3 cr.

**Subtotal: 17**

Subtotal: 87-89

Total Credit Hours: 87-89

The 2.0 required grade point average in the major will be based upon all BIO, CHEM, and FS courses pursued as a part of the student's degree program.

Note that no transfer credit is accepted for major-level science lab courses taught online.

### Forensic Chemistry Suggested Sequence of Courses

Notes:

The suggested sequence of courses in years two, three, and four is an example only. Some offerings for these years will alternate and the exact sequence will require consultation with the faculty and deans.

### Degree Requirements

Freshman Year - Fall Semester

BIO 107	General Biology I	3 cr.
BIO 117	General Biology Laboratory I	1 cr.
CHEM 105	General Chemistry I	4 cr.
ENGL 132	English Composition I	3 cr.
LA 100	First Year Seminar	2 cr.
MATH 133	Calculus I	4 cr.

**Subtotal: 17**

Freshman Year - Spring Semester

CHEM 106	General Chemistry II	4 cr.
CJ 101	Introduction to Criminal Justice	3 cr.
ENGL 133	English Composition II	3 cr.
MATH 134	Calculus II	4 cr.

**Subtotal: 14**

Sophomore Year - Fall Semester

CHEM 209	Organic Chemistry I	3 cr.
CHEM 219	Organic Chemistry Laboratory I	1 cr.
FS 201	Introduction to Forensics	4 cr.
MATH 121	Introductory Probability and	3 cr.

Statistics

PHYS 123	Physics of the Life Sciences I	4 cr.
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**Subtotal: 15**

Sophomore Year - Spring Semester

FS 240	Scientific Evidence	3 cr.
CHEM 210	Organic Chemistry II	3 cr.
CHEM 220	Organic Chemistry Laboratory II	1 cr.
CHEM 211	Analytical Methods	3 cr.
CHEM 221	Analytical Methods Laboratory	1 cr.
PHYS 124	Physics of the Life Sciences II	4 cr.

**Subtotal: 15**

Junior Year - Fall Semester

GUR xxx	General University Requirement	3 cr.
GEN XXX	General Elective	3 cr.
FS 310	Crime Scene Processing	3 cr.
PH 208	Ethics	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Junior Year - Spring Semester

CHEM 312	Instrumental Analysis	3 cr.
CHEM 322	Instrumental Analysis Laboratory	1 cr.
CHEM 314	Biochemistry	3 cr.
CHEM 324	Biochemistry Laboratory	1 cr.
GEN XXX	General Elective	3 cr.
GUR xxx	General University Requirement	3 cr.

**Subtotal: 14**

Senior Year - Fall Semester

CHEM 317	Physical Chemistry I	3 cr.
CHEM 327	Physical Chemistry Laboratory I	1 cr.
FS 425	Criminalistics I	4 cr.
CHEM 402	Toxicology	3 cr.
GEN XXX	General Elective	3 cr.
GUR xxx	General University Requirement	3 cr.

**Subtotal: 17**

Senior Year - Spring Semester

FS 426	Criminalistics II	4 cr.
FS 333	Independent Study in Forensic Science	1-3 cr.
	or	
FS 480	Internship in Forensic Chemistry and Forensic Biology	1-3 cr.
	or	
FS 440	Undergraduate Research	1-3 cr.

GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	1 cr.
CHEM 421	Inorganic Chemistry	3 cr.
CHEM 431	Inorganic Chemistry Laboratory	1 cr.

**Subtotal: 13-15**

Subtotal: 120-122

Total Credit Hours: 120-122

Health Sciences

**Health Sciences Major****General Information**

The Health Sciences curriculum prepares students for health-related careers by enabling them to acquire a strong foundation in both biology and chemistry that is required by many health-related professional paths including medicine, physician assistant, optometry, dentistry, and veterinary medicine, as well as graduate programs in biomedical sciences.

**Physical and Biological Faculty****Program Objectives:**

1. Understand the features of human anatomy and physiology at the cell, tissue, and organ system levels of organization. Explain homeostasis as it applies to human physiology.
2. Apply scientific principles to understanding current issues in human health and the prevention of disease and disability.
3. Understand the principles and mathematical analysis of genetics.
4. Predict and explain the function of biological macromolecules from knowledge of their chemical structures and organization.
5. Assess the thermodynamic and kinetic stability of a biochemical system.
6. Demonstrate knowledge of mechanistic organic chemistry and apply this knowledge to understanding biochemical reactions.
7. Plan and execute experiments through proper use of library resources.
8. Collect, analyze, and interpret qualitative and quantitative data.
9. Communicate effectively through oral and written reports.

**General University and College Requirements**

See General University Requirements (p. 33) and College of Arts and Sciences Requirements (p. 41)

**Degree Requirements****Required biology courses (20 credit hours)**

BIO 107	General Biology I	3 cr.
BIO 108	General Biology II	3 cr.
BIO 117	General Biology Laboratory I	1 cr.
BIO 118	General Biology Laboratory II	1 cr.
BIO 215	Anatomy and Physiology I	4 cr.
BIO 216	Anatomy and Physiology II	4 cr.
BIO 306	Genetics	4 cr.

**Subtotal: 20****Required health sciences courses (13 credit hours)**

HS 2xx-4xx	Twelve additional semester hours of HS 2xx-4xx courses	12 cr.
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HS 470	Seminar in Health Sciences	1 cr.
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**Subtotal: 13**

The following courses can count towards the HS 2xx-4xx requirements: BIO 203, BIO 310, BIO 312, NSCI 248, NSCI 348

**Required chemistry courses (20 credit hours)**

CHEM 105	General Chemistry I	4 cr.
CHEM 106	General Chemistry II	4 cr.
CHEM 209	Organic Chemistry I	3 cr.
CHEM 210	Organic Chemistry II	3 cr.
CHEM 219	Organic Chemistry Laboratory I	1 cr.
CHEM 220	Organic Chemistry Laboratory II	1 cr.
CHEM 314	Biochemistry	3 cr.
CHEM 324	Biochemistry Laboratory	1 cr.

**Subtotal: 20****Required courses in math, physics and statistics courses (17 credit hours)**

MATH 123	Calculus I for Management, Life, and Social Sciences	3 cr.
MATH 124	Calculus II For Management, Life, and Social Sciences	3 cr.
PHYS 123	Physics of the Life Sciences I	4 cr.
PHYS 124	Physics of the Life Sciences II	4 cr.
MATH 121	Introductory Probability and Statistics	3 cr.

**Subtotal: 17****Required courses in psychology and ethics (12 credit hours)**

PSY 101	Introduction to Psychology	3 cr.
PSY 201	Developmental Psychology	3 cr.
PSY 326	Abnormal Psychology	3 cr.
PH 208	Ethics	3 cr.
	or	
PH 231	Biomedical Ethics	3 cr.

**Subtotal: 12**

The 2.0 required grade-point average in the major would be based upon all HS, BIO (except BIO 15x and BIO 19x) and CHEM courses pursued as a part of the student's degree program.

Note that no transfer credit is accepted for major-level science lab courses taught online.

Subtotal: 82

Total Credit Hours: 82

**Health Sciences Suggested Sequence of Courses**

Notes: The suggested sequence of courses in years two, three, and four is an example only. Some offerings for these years will alternate and the exact sequence will require consultation with the faculty and deans.

## Degree Requirements

### Freshman Year - Fall Semester

BIO 107	General Biology I	3 cr.
BIO 117	General Biology Laboratory I	1 cr.
CHEM 105	General Chemistry I	4 cr.
ENGL 132	English Composition I	3 cr.
LA 100	First Year Seminar	2 cr.
MATH 123	Calculus I for Management, Life, and Social Sciences	3 cr.

**Subtotal: 16**

### Freshman Year - Spring Semester

BIO 108	General Biology II	3 cr.
BIO 118	General Biology Laboratory II	1 cr.
CHEM 106	General Chemistry II	4 cr.
ENGL 133	English Composition II	3 cr.
MATH 124	Calculus II For Management, Life, and Social Sciences	3 cr.

**Subtotal: 14**

### Sophomore Year - Fall Semester

CHEM 209	Organic Chemistry I	3 cr.
CHEM 219	Organic Chemistry Laboratory I	1 cr.
PSY 101	Introduction to Psychology	3 cr.
BIO 215	Anatomy and Physiology I	4 cr.
MATH 121	Introductory Probability and Statistics	3 cr.

**Subtotal: 14**

### Sophomore Year - Spring Semester

CHEM 210	Organic Chemistry II	3 cr.
CHEM 220	Organic Chemistry Laboratory II	1 cr.
PSY 201	Developmental Psychology	3 cr.
GUR xxx	General University Requirement	3 cr.
BIO 216	Anatomy and Physiology II	4 cr.

**Subtotal: 14**

### Junior Year - Fall Semester

PHYS 123	Physics of the Life Sciences I	4 cr.
PH 208	Ethics	3 cr.
	or	
PH 231	Biomedical Ethics	3 cr.
WIC 2XX	Writing Intensive Course	3 cr.
GEN XXX	General Elective	3 cr.
GEN 3XX	General Elective	3 cr.

**Subtotal: 16**

### Junior Year - Spring Semester

HS 2XX	HS Elective	4 cr.
HS 3XX	HS Elective	3 cr.
PHYS 124	Physics of the Life Sciences II	4 cr.
GEN 3XX	General Elective	3 cr.

**Subtotal: 14**

### Senior Year - Fall Semester

BIO 306	Genetics	4 cr.
GEN XXX	General Elective	3 cr.
GUR xxx	General University Requirement	3 cr.
GUR xxx	General University Requirement	3 cr.
HS 3XX	HS Elective	3 cr.

**Subtotal: 16**

### Senior Year - Spring Semester

CHEM 314	Biochemistry	3 cr.
CHEM 324	Biochemistry Laboratory	1 cr.
PSY 326	Abnormal Psychology	3 cr.
HS 470	Seminar in Health Sciences	1 cr.
GEN 3XX	General Elective	3 cr.
GEN 3XX	General Elective	3 cr.
HS 3XX	HS Elective	2 cr.

**Subtotal: 16**

Subtotal: 120

Total Credit Hours: 120

### Premedical Students:

Health Sciences majors intending to apply to medical school should contact the chairperson of the department or the premed advisor for additional information concerning sequence of courses.

## Pre-optometry Concentration in Health Sciences

### General Information

The Pre-optometry program offered by the College of Arts and Sciences is an accelerated track of the Health Sciences major that provides an opportunity for qualified students to prepare for early admission to the New England College of Optometry (NECO) in Boston through our articulation agreement. In addition, students who successfully complete their first year at NECO will have the option of receiving a BS in Health Sciences from Western New England University.

To successfully satisfy the requirements of the Western New England University Pre-optometry program, a student must:

- Complete the required 100 credits within three academic years as listed below for each fall and spring semester.
- Transfer in no credits (including AP credits) of science coursework completed prior to matriculation at Western New England University and, following matriculation, transfer in no credits for any science or mathematics courses satisfying a requirement for the Pre-optometry program.
- Maintain a sufficiently high GPA for all Pre-optometry course work with no grade in any course less than a "C". (See below for

the specific GPA requirements for NECO.) Entry points into the program:

1. Qualified students can be admitted into the Pre-optometry program as freshmen by WNE Admissions for the fall semester of a given year.
2. Students that have followed the course sequence of the Pre-optometry program at WNE during their freshman year can apply to the WNE Pre-optometry advisor prior to October 1 in the fall semester of the sophomore year for official admittance into the program. To be eligible:
  - A student must have shadowed the Pre-optometry program during their first year at WNE and earned a 3.3 overall GPA with a Science/Math GPA of 3.1 for all course work with no grade in any course less than a "C".
  - A student must not have transferred in credits (including AP credits) of science coursework completed prior to matriculation at Western New England University and, following matriculation, transferred in no credits for any science or mathematics courses satisfying a requirement for the Pre-optometry program.
  - If accepted into the program, a student has to complete the required 101 credits of the Pre-optometry program during their second and third year at WNE while maintaining a sufficiently high GPA for all Pre-optometry course work with no grade in any course less than a "C".

#### Agreement with NECO:

Students who have successfully completed the Western New England University Pre-optometry program requirements can be considered for early admission to the four-year optometry program (OD04) of the New England College of Optometry in Boston, which leads to the Doctor of Optometry degree.

Third-year students (juniors) of Western New England University will receive early admissions status to NECO's OD04 program under the agreement once they have:

1. Completed at least three (3) years of coursework as outlined below.
2. Met the academic prerequisites for NECO admission in place at the time of their formal admission into this WNE Pre-optometry program.
3. Adhered to the current admission standards of NECO (refer to the NECO web site for current standards).
4. Earned an overall cumulative undergraduate GPA of 3.3 and a science/math undergraduate GPA of 3.1 at the time of matriculation at NECO.
5. Completed the Optometry Centralized Application Service (OptomCAS) application by October 15 prior to the intended fall entrance date.
6. Taken the Optometry Admission Test (OAT) by September prior to the intended fall entrance date.
7. Received a 320 or above for the Academic Average on the Optometry Admission Test (OAT) with no OAT sub-score below 290.

8. Demonstrated strong evidence of commitment to the field of optometry through a shadowing experience with a practicing optometrist (details provided on the NECO's website and related literature).

9. Obtained three letters of recommendation from faculty and the optometrist who was shadowed.

10. Interviewed successfully (by NECO standards, as detailed on the NECO websites) with NECO faculty prior to receiving a final admissions decision.

Note: NECO reserves the right, at their sole discretion, to withdraw or reverse an admit status for any Western New England University 3+4 student who, subsequent to the offer of admissions, fails to remain in good academic and disciplinary standing.

In order to receive the BS in Health Sciences from Western New England University, students must provide WNE with the NECO transcript after successful completion of the first year of the OD04 program.

If a student has been admitted into the WNE Pre-optometry program, and then decides to first complete the BS in Health Sciences at WNE before moving on to NECO, NECO will still give that student's application special consideration.

Physical and Biological Science Faculty (p. 40)

#### General University and College Requirements

See General University Requirements and College of Arts and Sciences Requirements

#### Degree Requirements

##### Required biology and health science courses

BIO 107	General Biology I	3 cr.
BIO 117	General Biology Laboratory I	1 cr.
BIO 108	General Biology II	3 cr.
BIO 118	General Biology Laboratory II	1 cr.
BIO 203	Microbiology	4 cr.
BIO 215	Anatomy and Physiology I	4 cr.
BIO 216	Anatomy and Physiology II	4 cr.
BIO 306	Genetics	4 cr.
HS 470	Seminar in Health Sciences	1 cr.
		<b>Subtotal: 25</b>

##### Required chemistry courses

CHEM 105	General Chemistry I	4 cr.
CHEM 106	General Chemistry II	4 cr.
CHEM 209	Organic Chemistry I	3 cr.
CHEM 210	Organic Chemistry II	3 cr.
CHEM 219	Organic Chemistry Laboratory I	1 cr.
CHEM 220	Organic Chemistry Laboratory II	1 cr.
CHEM 314	Biochemistry	3 cr.

CHEM 324	Biochemistry Laboratory	1 cr.
		<b>Subtotal: 20</b>

Required math and physics courses

MATH 123	Calculus I for Management, Life, and Social Sciences	3 cr.
MATH 124	Calculus II For Management, Life, and Social Sciences	3 cr.
MATH 121	Introductory Probability and Statistics	3 cr.
PHYS 123	Physics of the Life Sciences I	4 cr.
PHYS 124	Physics of the Life Sciences II	4 cr.
		<b>Subtotal: 17</b>

Other required courses

PSY 101	Introduction to Psychology	3 cr.
PSY 201	Developmental Psychology	3 cr.
PSY 326	Abnormal Psychology	3 cr.
PH 208	Ethics	3 cr.
POSC 102	American National Government	3 cr.
CS 131	Computing for the Arts and Sciences	3 cr.
or		
CS 132	Principles of Computing	3 cr.
		<b>Subtotal: 18</b>

Additional requirements

Students need to fulfill all the General University Requirements and all the Arts & Sciences Requirements.  
Subtotal: 80

Total Credit Hours: 80

Pre-Optometry Suggested Sequence of Courses

Degree Requirements

Freshman Year - Fall Semester

BIO 107	General Biology I	3 cr.
BIO 117	General Biology Laboratory I	1 cr.
CHEM 105	General Chemistry I	4 cr.
ENGL 132	English Composition I	3 cr.
LA 100	First Year Seminar	2 cr.
MATH 123	Calculus I for Management, Life, and Social Sciences	3 cr.
		<b>Subtotal: 16</b>

Freshman Year - Spring Semester

BIO 108	General Biology II	3 cr.
BIO 118	General Biology Laboratory II	1 cr.
CHEM 106	General Chemistry II	4 cr.
ENGL 133	English Composition II	3 cr.

MATH 124	Calculus II For Management, Life, and Social Sciences	3 cr.
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PSY 101	Introduction to Psychology	3 cr.
		<b>Subtotal: 17</b>

Sophomore Year - Fall Semester

PSY 201	Developmental Psychology	3 cr.
CHEM 209	Organic Chemistry I	3 cr.
CHEM 219	Organic Chemistry Laboratory I	1 cr.
MATH 121	Introductory Probability and Statistics	3 cr.
CS 131	Computing for the Arts and Sciences	3 cr.
or		
CS 132	Principles of Computing	3 cr.
PHYS 123	Physics of the Life Sciences I	4 cr.
		<b>Subtotal: 17</b>

Sophomore Year - Spring Semester

CHEM 210	Organic Chemistry II	3 cr.
CHEM 220	Organic Chemistry Laboratory II	1 cr.
CUL 2XX	Cultural Studies Perspective	3 cr.
PHYS 124	Physics of the Life Sciences II	4 cr.
PH 208	Ethics	3 cr.
POSC 102	American National Government	3 cr.
		<b>Subtotal: 17</b>

Junior Year - Fall Semester

BIO 306	Genetics	4 cr.
BIO 215	Anatomy and Physiology I	4 cr.
ART XXX	Aesthetic Perspective	3 cr.
HIST XXX	Historical Perspective	3 cr.
WIC 2XX	Writing Intensive Course	3 cr.
		<b>Subtotal: 17</b>

Junior Year - Spring Semester

BIO 216	Anatomy and Physiology II	4 cr.
CHEM 314	Biochemistry	3 cr.
CHEM 324	Biochemistry Laboratory	1 cr.
PSY 326	Abnormal Psychology	3 cr.
BIO 203	Microbiology	4 cr.
HS 470	Seminar in Health Sciences	1 cr.
		<b>Subtotal: 16</b>

\*Two of the above courses must meet WIC requirement.  
Subtotal: 100

Total Credit Hours: 100



## Pre-physician Assistant Concentration in Health Sciences

### General Information

The Pre-physician Assistant program offered by the College of Arts and Sciences is an accelerated track of the Health Sciences major that provides an opportunity for qualified students to prepare for early admission to the Master of Medical Sciences (MMS) Degree Program at Salus University in Elkins Park, PA, through our articulation agreement. In addition, students who successfully complete their first year at Salus University will have the option of receiving a BS in Health Sciences from Western New England University (WNE).

To successfully satisfy the requirements of the Western New England University Pre-PA program, a student must:

1. Complete the required 100 credits within three academic years as listed below.
2. Transfer in no credits (including AP credits) of science coursework completed prior to matriculation at WNE and, following matriculation, transfer in no credits for any science or mathematics course satisfying a requirement for the Pre-physician Assistant program.
3. Maintain an overall GPA of 3.7 or above with no grade in any course less than a "C". Students may not withdraw from or retake any course that would have satisfied any of the Pre-physician Assistant program requirements.

Agreement with Salus University:

Students who have successfully completed the Western New England University Pre-physician Assistant Program as described above can be considered for early admission into the Master of Medical Sciences (MMS) Degree Program at Salus University.

Students must apply to the Salus University Master of Medical Sciences Degree Program by following the application procedures described on the Salus University website. These admissions procedures include completion of:

1. All prerequisites and requirements as published by Salus University.
2. The Centralized Application Service for Physician Assistant (CASPA) process and requirements, including required letters of recommendation and GRE scores, by August 1 of the year prior to anticipated enrollment
3. An on-campus interview.

Under the articulation agreement, Salus will provide up to four seats for qualified Western New England University Pre-PA Program students annually who apply for admission and are accepted into the Salus MMS Degree Program.

If there are more than four equally qualified Western New England University Pre-PA applicants, they will be considered in the order of the timing of their completed CASPA applications. If Western New England University Pre-PA applicants are not accepted, they will be encouraged to reapply for the following cycle and given consideration for admission to the Salus University Physician Assistant Studies Program along with other applicants in the Salus

University applicant pool contingent upon successful student completion of a bachelor's degree program at Western New England University.

Physical and Biological Science Faculty (p. 40)

### General University and College Requirements

See General University Requirements (p. 33) and College of Arts and Sciences Requirements (p. 41)

### Degree Requirements

#### Required biology and health science courses

BIO 107	General Biology I	3 cr.
BIO 117	General Biology Laboratory I	1 cr.
BIO 108	General Biology II	3 cr.
BIO 118	General Biology Laboratory II	1 cr.
BIO 203	Microbiology	4 cr.
BIO 215	Anatomy and Physiology I	4 cr.
BIO 216	Anatomy and Physiology II	4 cr.
BIO 306	Genetics	4 cr.
HS 470	Seminar in Health Sciences	1 cr.
		<b>Subtotal: 25</b>

#### Required chemistry courses

CHEM 105	General Chemistry I	4 cr.
CHEM 106	General Chemistry II	4 cr.
CHEM 209	Organic Chemistry I	3 cr.
CHEM 210	Organic Chemistry II	3 cr.
CHEM 219	Organic Chemistry Laboratory I	1 cr.
CHEM 220	Organic Chemistry Laboratory II	1 cr.
CHEM 314	Biochemistry	3 cr.
CHEM 324	Biochemistry Laboratory	1 cr.
		<b>Subtotal: 20</b>

#### Required math and physics courses

MATH 123	Calculus I for Management, Life, and Social Sciences	3 cr.
MATH 124	Calculus II For Management, Life, and Social Sciences	3 cr.
MATH 121	Introductory Probability and Statistics	3 cr.
PHYS 123	Physics of the Life Sciences I	4 cr.
PHYS 124	Physics of the Life Sciences II	4 cr.
		<b>Subtotal: 17</b>

Other required courses

PSY 101	Introduction to Psychology	3 cr.
PSY 201	Developmental Psychology	3 cr.
PSY 326	Abnormal Psychology	3 cr.
PH 208	Ethics	3 cr.
POSC 102	American National Government	3 cr.
CS 131	Computing for the Arts and Sciences	3 cr.
	or	
CS 132	Principles of Computing	3 cr.
		<b>Subtotal: 18</b>

Additional requirements

Students need to fulfill all the General University Requirements and all the Arts & Sciences Requirements.  
Subtotal: 80

Total Credit Hours: 80

Pre-Physician Assistant Suggested Sequence of Courses

Degree Requirements

Freshman Year - Fall Semester

BIO 107	General Biology I	3 cr.
BIO 117	General Biology Laboratory I	1 cr.
CHEM 105	General Chemistry I	4 cr.
ENGL 132	English Composition I	3 cr.
LA 100	First Year Seminar	2 cr.
MATH 123	Calculus I for Management, Life, and Social Sciences	3 cr.
		<b>Subtotal: 16</b>

Freshman Year - Spring Semester

BIO 108	General Biology II	3 cr.
BIO 118	General Biology Laboratory II	1 cr.
CHEM 106	General Chemistry II	4 cr.
ENGL 133	English Composition II	3 cr.
MATH 124	Calculus II For Management, Life, and Social Sciences	3 cr.
PSY 101	Introduction to Psychology	3 cr.
		<b>Subtotal: 17</b>

Sophomore Year - Fall Semester

PSY 201	Developmental Psychology	3 cr.
CHEM 209	Organic Chemistry I	3 cr.
CHEM 219	Organic Chemistry Laboratory I	1 cr.
MATH 121	Introductory Probability and Statistics	3 cr.
CS 131	Computing for the Arts and	3 cr.

Sciences

	or	
CS 132	Principles of Computing	3 cr.
BIO 215	Anatomy and Physiology I	4 cr.
		<b>Subtotal: 17</b>

Sophomore Year - Spring Semester

CHEM 210	Organic Chemistry II	3 cr.
CHEM 220	Organic Chemistry Laboratory II	1 cr.
CUL XXX	Global Cultures Perspective	3 cr.
BIO 216	Anatomy and Physiology II	4 cr.
PH 208	Ethics	3 cr.
POSC 102	American National Government	3 cr.
		<b>Subtotal: 17</b>

Junior Year - Fall Semester

BIO 306	Genetics	4 cr.
PHYS 123	Physics of the Life Sciences I	4 cr.
ART XXX	Aesthetic Perspective	3 cr.
HIST XXX	Historical Perspective	3 cr.
WIC 2XX	Writing Intensive Course	3 cr.
		<b>Subtotal: 17</b>

Junior Year - Spring Semester

PHYS 124	Physics of the Life Sciences II	4 cr.
CHEM 314	Biochemistry	3 cr.
CHEM 324	Biochemistry Laboratory	1 cr.
PSY 326	Abnormal Psychology	3 cr.
BIO 203	Microbiology	4 cr.
HS 470	Seminar in Health Sciences	1 cr.
		<b>Subtotal: 16</b>

Subtotal: 100

Total Credit Hours: 100

NOTE:

Students interested in applying to other PA programs should check with those schools for their particular admission requirements, which may require applicants to have a bachelor's degree.

Agreement with Physician Assistant Program at Bryant University

Agreement with Physician Assistant Program at Bryant University

Students who have successfully completed the requirements listed below for the application to the Master of Science in Physician Assistant Studies ("PA") program offered through the School of Health Sciences at Bryant University are eligible for a guaranteed interview and consideration for acceptance should they be a competitive candidate.

Qualified WNE applicants must meet or exceed all Bryant PA Program prerequisites as outlined on the Bryant website ([www.bryant.edu/mspas](http://www.bryant.edu/mspas)) which include, but are not limited to:

- A baccalaureate degree
- An overall undergraduate GPA of at least 3.0.
- Completion of the following prerequisite courses with a minimum GPA of 3.0 overall for these prerequisite courses and a "C" or better in each class:
  - Biology with lab: 8SH
  - Chemistry with lab: 8SH
  - Human Anatomy and Physiology: 8SH
  - Microbiology: 3SH
  - Organic Chemistry (4 SH) or Biochemistry (3 SH)
  - Psychology: 3SH
  - Statistics: 3SH• NOTE: Advanced Placement (AP)/CLEP coursework may be accepted for Psychology (3SH) and Statistics (3SH). No Advanced Placement (AP)/CLEP coursework or transfer credits to fulfill science prerequisite requirements will be accepted.
    - 2000 hours of direct patient care experience completed before December 1 of the year prior to matriculation
      - o Examples of direct patient care experience includes, but is not necessarily limited to: military medics, corpsmen, health service technicians, and medical technicians; nurses, emergency medical technicians and paramedics; emergency department technicians; medical scribes; physical and occupational therapists; respiratory therapists; medical assistants
    - A GRE Score within 5 years of matriculation
    - A completed CASPA Application

Potential applicants with questions about the PA Program should refer to the PA Program webpage ([www.bryant.edu/mspas](http://www.bryant.edu/mspas)) or may contact the program by e-mail ([pa\\_program@bryant.edu](mailto:pa_program@bryant.edu)) or phone (401-232-6556).

### 3+2 Health Sciences/Biology/Chemistry-MSPS Dual Degree Option

The College of Arts and Sciences and the College of Pharmacy and Health Sciences at Western New England University have collaborated to offer a program unique to western Massachusetts for those students interested in attaining a Bachelor of Science in Health Sciences, Chemistry, or Biology and furthering their career with a thesis-based Master of Science in Pharmaceutical Sciences (MSPS). This is a dual degree program, where students completing the requirements for each program will receive two separate degrees, requiring just one additional year of study beyond the normal 4-year bachelor's program.

Students can earn both the applicable BS degree and the MSPS degree within five years of entry as an undergraduate. Students admitted by WNE Admissions as undergraduates are only admitted into the BS degree portion of the program. Transition into the MSPS program is not automatic, nor is acceptance into the MSPS program guaranteed, but requires application and acceptance into the MSPS program. The MSPS program admission requirements can be found in the "Master of Science in Pharmaceutical Sciences" program description in this catalogue.

Students in good standing in the Health Sciences, Biology, or Chemistry majors, whom are on track to complete the required

courses of their major within three years (including general university and college requirements), are eligible to apply for admission to the MSPS degree program during their junior year after December 1. Candidates must successfully submit their application materials, as well as complete an admissions interview.

Depending on the specific BS program, there will be cross-credits between the two programs, i.e., courses for which credit will apply to the completion of both degrees. For all of the listed BS degrees, up to 31 credits of first-year MSPS courses will fulfill course requirements in the BS degrees (with some exceptions depending on the undergraduate degree being pursued). All students choosing this unique curricular path must consult closely with their faculty advisor to ensure all course requirements of their BS program are completed before their fourth year (Chemistry majors will need to complete BIO 107/BIO 117, General Biology I).

Students in the Health Sciences/Biology/Chemistry major that either (a) do not meet the MSPS program admission requirements during their junior year, or (b) elect not to apply for admission to the MSPS program at that time, remain eligible to apply for admission as part of the general applicant pool following four years of University study and completion of a bachelor's degree.

### Degree Requirements

MSPS Curriculum Years - 45 TOTAL CREDIT HOURS OVER THE LAST 2 YEARS

#### Senior Year (1st Year MSPS) - Fall Semester

PHRSC 510	Seminar & Journal Club 1	1 cr.
PHAR 512	Immunology	3 cr.
PHAR 513	Biochemistry	3 cr.
PHAR 514	Pharmaceutics I	2 cr.
PHAR 611	Principles of Pharmacology	3 cr.
PHAR 612	Principles of Medicinal Chemistry	3 cr.
PHRSC 527	Data Analysis & Biostatistics	3 cr.

**Subtotal: 18**

#### Senior Year (1st Year MSPS) - Spring Semester

PHRSC 520	Seminar & Journal Club 2	1 cr.
PHRSC 526	Analytical Techniques Lab	1 cr.
PHAR 522	Pathophysiology	3 cr.
PHAR 523	Genetics & Genomics	2 cr.
PHAR 524	Pharmaceutics II	2 cr.
PHAR 525	Pharmaceutics II Lab	1 cr.
PHRSC-PHAR-GEN xxx	Pharmacy Science-Pharmacy-General Elective	3 cr.

**Subtotal: 13**

#### Senior Year (1st Year MSPS) - Summer

PHRSC 528	Thesis Research 1	2 cr.
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**Subtotal: 2**

Second Year MSPS - Fall Semester

PHRSC 610	Seminar & Journal Club 3	1 cr.
PHRSC 618	Thesis Research 2	2 cr.
PHRSC-PHAR-GEN xxx	Pharmacy Science-Pharmacy-General Elective	3 cr.
<b>Subtotal: 6</b>		

Second Year MSPS - Spring Semester

PHRSC 620	Seminar & Journal Club 4	1 cr.
PHRSC 628	Thesis Research 3	2 cr.
PHRSC-PHAR-GEN xxx	Pharmacy Science-Pharmacy-General Elective	3 cr.
<b>Subtotal: 6</b>		

Subtotal: 45

Total Credit Hours: 45

### 3+1.3 Health Sciences/Biology-MSPGx Dual Degree Option

The College of Arts and Sciences and the College of Pharmacy and Health Sciences at Western New England University have collaborated to offer a program unique to western Massachusetts for those students interested in attaining a Bachelor of Science in Health Sciences or Biology, and furthering their career with a Master of Science in Pharmacogenomics (MSPGx). This is a dual degree program, where students completing the requirements for each program will receive two separate degrees, requiring just one additional (summer) semester of study beyond the normal 4-year bachelor’s program.

Students can earn both the applicable BS degree and the MSPGx degree within 4.3 years (i.e., 4 years and 1 summer semester) of entry as an undergraduate. Students admitted by WNE Admissions as undergraduates are only admitted into the BS degree portion of the program. Transition into the MSPGx program is not automatic, nor is acceptance into the MSPGx program guaranteed, but requires application and acceptance into the MSPGx program. The MSPGx program admission requirements can be found in the “Master of Science in Pharmacogenomics” program description in this catalogue.

Students in good standing in the Health Sciences or Biology majors, whom are on track to complete the bulk of the required (not elective) courses of their major within three years (including general university and college requirements), are eligible to apply for admission to the MSPGx degree program during their junior year after December 1. Candidates must successfully submit their application materials for admission consideration to the MSPGx program.

After successfully completing the first year (Fall and Spring) of the MSPGx program, students will be awarded a Bachelor of Science degree in Health Sciences or Biology, assuming all degree requirements have been met (including the 30 hours of 300-level or above credit requirement and the 120 minimum credit rule). After completing the summer semester of the MSPGx program, assuming all of the degree requirements have been met (41 credits), students will be awarded the Masters of Science in Pharmacogenomics.

Depending on the specific BS program (refer to the “Health Sciences

Major” or “Biology Major” descriptions in this catalogue for the specific curriculum of each program), there will be cross-credits between the two programs, i.e., courses for which credit will apply to the completion of both degrees. Up to 29 credits of first-year (Fall and Spring) MSPGx courses (with some exceptions) will be accepted into the respective BS program as follows:

- For the BS in Health Sciences or Biology, PHAR 516 (Pharmacy Ethics), PHAR 526 (Pharmacy Outcomes), PHRSC 510 (Seminar & Journal Club 1), PHRSC 520 (Seminar & Journal Club 2), PHRSC 526 (Analytical Techniques), PHRSC 527 (Data Analysis and Biostatistics), and PHRSC 551 (Introduction to Genetics and Genetic Counseling) can fulfill GEN XXX (General Elective) requirements.
- For the BS in Health Sciences, the courses PHAR 522 (Pathophysiology), PHAR 611 (Principles of Pharmacology), PHRSC 552 (Advanced Genetics and Genomics), and PHRSC 553 (Genetics Data Analysis—Bioinformatics) can fulfill HS or GEN elective requirements, but only if the student did not already take a similarly-titled course as part of their undergraduate degree program. If the student already took such a course, the graduate course credits cannot count towards the undergraduate degree. The course PHAR 513 (Biochemistry) cannot count towards the BS in Health Sciences degree.
- For the BS in Biology, the courses PHAR 513 (Biochemistry), PHAR 522 (Pathophysiology), PHAR 61 I (Principles of Pharmacology) , PHRSC 552 (Advanced Genetics and Genomics), and PHRSC 553 (Genetics Data Analysis—Bioinformatics) can fulfill BIO or GEN elective requirements, but only if the student did not already take a similarly-titled course as part of their undergraduate degree program. If the student already took such a course, the graduate course credits cannot count towards the undergraduate degree.

Students in the Health Sciences or Biology majors that either (a) do not meet the MSPGx program admission requirements during their junior year, or (b) elect not to apply for admission to the MSPGx program at that time, remain eligible to apply for admission as part of the general applicant pool following four years of University study and completion of a bachelor’s degree.

### Degree Requirements

BSHS/Biology Curriculum Years – 120 Total Credit hours over the First 4 Years

- Meet with your faculty advisor to select the proper order and courses to take in the first 3 years, so as to incorporate the MSPGx courses in the 4th year.
- MSPGx Curriculum Years - 41 Total Credit Hours over the Last 1.3 Years

#### Senior Year BS / First Year MSPGx - Fall Semester

PHAR 513	Biochemistry	3 cr.
PHAR 516	Pharmacy Ethics	3 cr.
PHAR 611	Principles of Pharmacology	3 cr.
PHRSC 510	Seminar & Journal Club 1	1 cr.
PHRSC 527	Data Analysis & Biostatistics	3 cr.

PHRSC 551	Introduction to Genetics and Genetic Counseling	3 cr.
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**Subtotal: 16**

## Senior Year BS / First Year MSPGx - Spring Semester

PHAR 522	Pathophysiology	3 cr.
PHAR 526	Pharmacy Outcomes	2 cr.
PHRSC 520	Seminar & Journal Club 2	1 cr.
PHRSC 526	Analytical Techniques Lab	1 cr.
PHRSC 552	Advanced Genetics and Genomics	3 cr.
PHRSC 553	Genetic Data Analysis - Bioinformatics	3 cr.

**Subtotal: 13**

## First Year MSPGx - Summer Semester

PHRSC 554	Applied Pharmacogenomics Experience	6 cr.
PHRSC 555	Clinical Pharmacogenomics Experience	6 cr.

**Subtotal: 12**

## MSPGx Degree completion requirements:

- 1) All courses passed (“C” or better), with no more than two courses with a grade of “C” or “C+”; and
- 2) Attain an overall grade point average of 3.0 or higher.

Subtotal: 41

Total Credit Hours: 41

Health Studies

## Health Studies

## General Information

The goal of the Health Studies major is to provide students with the undergraduate preparation necessary to seek employment in a healthcare field or to obtain the background necessary for more advanced training in health-related fields that focus on the social, psychological, and public health perspectives.

Note: The required courses of the BS in Health Studies curriculum do not fulfill all of the course prerequisite admission requirements of the WNE Doctor of Pharmacy program. Students that are interested in following the undergraduate Pharmacy curriculum or are considering applying to Physician Assistant programs, Doctor of Optometry programs, or medical and dental schools are advised to consider following the BS in Health Sciences curriculum instead.

## Career Opportunities

Professional programs in various health-related fields, e.g., occupational therapy, physical therapy, health education, patient advocacy, public and community health, accelerated bachelor of

science degree in nursing programs, etc.

## Physical and Biological Faculty

## Program Objectives:

Upon completing this program, a Health Studies major will be able to:

1. Understand the features of human anatomy and physiology at the cell, tissue, and organ system levels of organization. Explain homeostasis as it applies to human physiology.
2. Apply scientific principles to understanding current issues in human health and the prevention of disease and disability.
3. Collect, analyze, and interpret qualitative and quantitative data.
4. Communicate effectively through oral and written reports.

## General University and College Requirements

See General University Requirements (p. 33) and College of Arts and Sciences Requirements (p. 41)

## Degree Requirements

Required biology courses and chemistry courses (24 credit hours)

BIO 107	General Biology I	3 cr.
BIO 108	General Biology II	3 cr.
BIO 117	General Biology Laboratory I	1 cr.
BIO 118	General Biology Laboratory II	1 cr.
BIO 215	Anatomy and Physiology I	4 cr.
BIO 216	Anatomy and Physiology II	4 cr.
CHEM 105	General Chemistry I	4 cr.
CHEM 106	General Chemistry II	4 cr.

**Subtotal: 24**

Required health sciences courses (12 credit hours)

HS 2xx-4xx	Twelve additional semester hours of HS 2xx-4xx courses	12 cr.
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**Subtotal: 12**

with a minimum of 3 credits of HS coursework at the 300-level and above.

Additional courses that fulfill the HS 2xx-HS 4xx requirements: BIO 203, BIO 310, BIO 312, BIO 320, NSCI 212, NSCI 248, NSCI 348 (Note: BIO 310 and BIO 320 have a CHEM 210 prerequisite.)

Other required courses (21 credit hours)

PSY 101	Introduction to Psychology	3 cr.
PSY 201	Developmental Psychology	3 cr.
PSY 3XX	Psychology Elective	3 cr.
PSY 3XX	Psychology Elective	3 cr.
MATH 120	Intro Statistics for the Arts & Sciences	3 cr.

	or		
MATH 121	Introductory Probability and Statistics	3 cr.	
PH 208	Ethics	3 cr.	
	or		
PH 231	Biomedical Ethics	3 cr.	
COMM 102	Introduction to Public Speaking	3 cr.	

**Subtotal: 21**

The 2.0 required grade-point average in the major would be based upon all HS, BIO, CHEM and PSY courses pursued as a part of the student's degree program.

Note that no transfer credit is accepted for major-level science lab courses taught online.

Subtotal: 57

Total Credit Hours: 57

### Health Studies Suggested Sequence of Courses

Notes: The suggested sequence of courses in years two, three, and four is an example only. Some offerings for these years will alternate and the exact sequence will require consultation with the faculty and deans.

### Degree Requirements

#### Freshman Year - Fall Semester

BIO 107	General Biology I	3 cr.
BIO 117	General Biology Laboratory I	1 cr.
CHEM 105	General Chemistry I	4 cr.
ENGL 132	English Composition I	3 cr.
LA 100	First Year Seminar	2 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 16**

#### Freshman Year - Spring Semester

BIO 108	General Biology II	3 cr.
BIO 118	General Biology Laboratory II	1 cr.
CHEM 106	General Chemistry II	4 cr.
ENGL 133	English Composition II	3 cr.
COMM 102	Introduction to Public Speaking	3 cr.

**Subtotal: 14**

#### Sophomore Year - Fall Semester

MATH 1XX	Mathematical Analysis	3 cr.
PSY 101	Introduction to Psychology	3 cr.
BIO 215	Anatomy and Physiology I	4 cr.
WIC 2XX	Writing Intensive Course	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 16**

#### Sophomore Year - Spring Semester

MATH 120	Intro Statistics for the Arts & Sciences	3 cr.
	or	
MATH 121	Introductory Probability and Statistics	3 cr.
PSY 201	Developmental Psychology	3 cr.
BIO 216	Anatomy and Physiology II	4 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 16**

#### Junior Year - Fall Semester

PH 208	Ethics	3 cr.
	or	
PH 231	Biomedical Ethics	3 cr.
GUR xxx	General University Requirement	3 cr.
HS 2XX	HS Elective	3 cr.
GEN 3XX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

#### Junior Year - Spring Semester

HS 3XX	HS Elective	3 cr.
WIC 3XX	Writing Intensive Course	3 cr.
PSY 3XX	Psychology Elective	3 cr.
GEN 3XX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

#### Senior Year - Fall Semester

GUR xxx	General University Requirement	3 cr.
HS 3XX	HS Elective	3 cr.
GUR xxx	General University Requirement	3 cr.
PSY 3XX	Psychology Elective	3 cr.
GEN 3XX	General Elective	3 cr.
GEN XXX	General Elective	1 cr.

**Subtotal: 16**

#### Senior Year - Spring Semester

HS 3XX	HS Elective	3 cr.
GUR xxx	General University Requirement	3 cr.
GEN 3XX	General Elective	3 cr.
GEN 3XX	General Elective	3 cr.

**Subtotal: 12**

#### Additional suggested courses

Students that are preparing for admission to specific professional health-related graduate degree programs or are interested in deeper

knowledge in a particular area might consider using some of their electives to take the courses recommended below. These courses are not required to complete the B.S. in Health Studies degree. Some of these courses also count towards a minor program of study that a student might be interested in pursuing.

#### Health Communication

##### Recommended courses

COMM 100	Principles of Communication	3 cr.
COMM 283	Health Communication	3 cr.
COMM 320	Small Group Communication	3 cr.
COMM 321	Interpersonal Communication	3 cr.
COMM 328	Health Communication Campaigns	3 cr.

Note: COMM 100, COMM 102, COMM 320, and COMM 321 count towards the Minor in Communication.

#### Physical Therapy

##### Recommended courses

MATH 123	Calculus I for Management, Life, and Social Sciences	3 cr.
PHYS 123	Physics of the Life Sciences I	4 cr.
PHYS 124	Physics of the Life Sciences II	4 cr.

Students are strongly encouraged to explore the particular requirements of the Doctor of Physical Therapy program they plan to apply to.

#### Nursing

##### Recommended courses

BIO 203	Microbiology	4 cr.
HS 210	Nutrition	3 cr.

Students that are interested in applying to an Accelerated Bachelor of Science in Nursing Program after completing the B.S. in Health Studies should consider taking BIO 203 (Microbiology) and HS 210 (Nutrition) as part of their HS electives. In addition, students are strongly encouraged to explore the particular requirements of the program they plan to apply to.  
Subtotal: 120

Total Credit Hours: 120

## Pre-occupational Therapy Concentration in Health Studies

### General Information

The Pre-occupational Therapy program offered by the College of Arts and Sciences is an accelerated track of the Health Studies major that provides an opportunity for qualified students to prepare for early admission to the Doctor of Occupational Therapy Degree (OTD) Program at Western New England University following three years of study (3+3 program). In addition, students who successfully complete their first year in the WNE OTD program will have the opportunity of receiving a BS in Health Studies from Western New England University (WNE).

To successfully satisfy the requirements of the WNE Pre-occupational Therapy program, a student must:

1. Complete the required 92 credits listed below within three academic years.
2. Transfer in no credits (except for AP credits) of science coursework completed prior to matriculation at WNE and, following matriculation, transfer in no credits for any science course satisfying a requirement of the Pre-occupational Therapy program.
3. Maintain (a) a minimum overall GPA of 3.20, (b) a minimum GPA of 3.20 in the required prerequisite coursework for the Doctor of Occupational Therapy program (see OTD Admissions webpage for the list of courses), and (c) earned no course grade less than "C" in any required prerequisite coursework for the OTD program.

Qualified students can be admitted into the Pre-occupational Therapy program as freshmen by WNE Admissions for the fall semester of a given year.

In addition, students that have followed and successfully completed the first-year course sequence of the Pre-occupational Therapy program as listed below during their freshman year at WNE and have fulfilled requirements number 2 and 3 above, can apply to the Pre-OT program prior to October 1 in the fall semester of their sophomore year for official admittance into the 3+3 program. If admitted, a student will need to complete the required 92 credits during their second and third year at WNE while continuing to fulfill requirements number 2 and 3 above.

Students in the 3+3 program are eligible to apply for admission to the Doctor of Occupational Therapy Degree program during their junior year after December 1.

In addition to fulfilling all of the requirements of the Pre-occupational Therapy program, candidates for admission to the OTD program must successfully complete all other OTD admission requirements as listed on the OTD Admissions webpage, including observation hour requirements, essay prompts, and a course in Medical Terminology.

Candidates must also successfully complete an admissions interview and writing sample; select candidates may have the admissions interview and writing sample requirements waived by the Doctor of Occupational Therapy program admissions committee. Health Studies students in the 3+3 program are not guaranteed admission to the Doctor of Occupational Therapy degree program, regardless of their ability to meet the admission eligibility requirements.

Students admitted to the Doctor of Occupational Therapy program through the 3+3 program would earn a Bachelor of Science degree in Health Studies following successful completion of the first year of the Doctor of Occupational Therapy Degree program. Health Studies students who are admitted to the Doctor of Occupational Therapy Degree program through the 3+3 program must understand that they will be taking graduate-level courses to complete their BS in Health Studies degree. Graduate level courses are designed to provide advanced level content, and foster self-directed intellectual curiosity and critical thinking. Expected performance in these courses will be the same regardless of a student's academic status as an undergraduate or a graduate student.

Students who enter the 3+3 program but (a) do not meet the Doctor of Occupational Therapy Degree program admission requirements outlined above, or (b) elect not to apply for admission to the Doctor of Occupational Therapy Degree program at that time, remain eligible to apply for admission to the Doctor of Occupational Therapy Degree as part of the general applicant pool following four years of University study and completion of a bachelor's degree.

**Physical and Biological Science Faculty (p.)**

**General University and College Requirements**

See General University Requirements (p.??) and College of Arts and Sciences Requirements (p.??)

**Degree Requirements**

Required biology courses and chemistry courses (24 credit hours)

BIO 107	General Biology I	3 cr.
BIO 108	General Biology II	3 cr.
BIO 117	General Biology Laboratory I	1 cr.
BIO 118	General Biology Laboratory II	1 cr.
BIO 215	Anatomy and Physiology I	4 cr.
BIO 216	Anatomy and Physiology II	4 cr.
CHEM 105	General Chemistry I	4 cr.
CHEM 106	General Chemistry II	4 cr.

**Subtotal: 24**

Required health sciences courses (6 credit hours)

HS 2xx-4xx	Six additional semester hours of HS 2xx-4xx courses	6 cr.
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**Subtotal: 6**

Additional courses that fulfill the HS 2xx-HS 4xx requirements: BIO 203, BIO 310, BIO 312, BIO 320, NSCI 212, NSCI 248, NSCI 348 (Note: BIO 310 and BIO 320 have a CHEM 210 prerequisite.)

Other required courses (27 credit hours)

PSY 101	Introduction to Psychology	3 cr.
PSY 201	Developmental Psychology	3 cr.
PSY 326	Abnormal Psychology	3 cr.
PSY 3XX	Psychology Elective	3 cr.
PHYS 110	Physics of the Human Body	3 cr.
SO 101	Introduction to Sociology	3 cr.
	or	
PSY 214	Social Psychology	3 cr.
MATH 120	Intro Statistics for the Arts & Sciences	3 cr.
	or	
MATH 121	Introductory Probability and Statistics	3 cr.
PH 208	Ethics	3 cr.
	or	
PH 231	Biomedical Ethics	3 cr.
COMM 102	Introduction to Public Speaking	3 cr.

**Subtotal: 27**

**Additional Requirements**

Students need to fulfill all the General University Requirements and all the Arts & Sciences Requirements.

Subtotal: 57

**Degree Requirements**

Notes:

The suggested sequence of courses is an example only. Some offerings for these years will alternate and the exact sequence will require consultation with the faculty and deans.

**Freshman Year - Fall Semester**

BIO 107	General Biology I	3 cr.
BIO 117	General Biology Laboratory I	1 cr.
CHEM 105	General Chemistry I	4 cr.
ENGL 132	English Composition I	3 cr.
LA 100	First Year Seminar	2 cr.
CS XXX	Computer Competence Requirement	3 cr.

**Subtotal: 16**

**Freshman Year - Spring Semester**

BIO 108	General Biology II	3 cr.
BIO 118	General Biology Laboratory II	1 cr.
CHEM 106	General Chemistry II	4 cr.
ENGL 133	English Composition II	3 cr.
COMM 102	Introduction to Public Speaking	3 cr.

**Subtotal: 14**

**Sophomore Year - Fall Semester**

MATH 1XX	Mathematical Analysis	3 cr.
PSY 101	Introduction to Psychology	3 cr.
BIO 215	Anatomy and Physiology I	4 cr.
WIC 2XX	Writing Intensive Course	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 16**

**Sophomore Year - Spring Semester**

MATH 120	Intro Statistics for the Arts & Sciences	3 cr.
	or	
MATH 121	Introductory Probability and Statistics	3 cr.
PSY 201	Developmental Psychology	3 cr.
BIO 216	Anatomy and Physiology II	4 cr.
CUL XXX	Global Cultures Perspective	3 cr.
SO 101	Introduction to Sociology	3 cr.
	or	



PSY 214	Social Psychology	3 cr.
		<b>Subtotal: 16</b>

## Junior Year - Fall Semester

PH 208	Ethics	3 cr.
or		
PH 231	Biomedical Ethics	3 cr.
ART XXX	Aesthetic Perspective	3 cr.
HS 2XX	HS Elective	3 cr.
PHYS 110	Physics of the Human Body	3 cr.
PSY 3XX	Psychology Elective	3 cr.

**Subtotal: 15**

## Junior Year - Spring Semester

HS 2XX	HS Elective	3 cr.
WIC 3XX	Writing Intensive Course	3 cr.
HIST XXX	Historical Perspective	3 cr.
PSY 326	Abnormal Psychology	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Subtotal: 92

History

## History Major

## General Information

The study of history provides students with insight into the political, social, economic, and cultural forces that have shaped the modern world. The History program is designed to give students an introduction to world civilizations and to the history of the United States. Course offerings and distribution requirements ensure breadth of study by providing exposure to non-Western history as well as advanced courses in American and European history.

## Career Opportunities

Students who major in History can pursue a variety of careers. Our graduates have become teachers, researchers, and journalists. They work in libraries and government agencies including the diplomatic service. Others have found opportunities in business where the skills gained in the study of history (research, analysis, and writing) are valued. Many graduates attend law school or have pursued advanced degrees in history.

## History and Political Science Faculty

## Program Objectives

1. To provide students with a breadth of knowledge of the development of world civilizations.
2. To give a solid introduction to the history of the United States.
3. To expose students at an advanced level to the histories of Europe, the United States, and non-Western countries.
4. To give students the research skills to work with primary and secondary sources.
5. To give students the ability to construct and write a coherent, logical, and grammatical argument.

6. To develop critical reading skills.

## General University and College Requirements

See General University Requirements (p. 33) and College of Arts and Sciences Requirements (p. 41).

## Degree Requirements

## Required Courses (18 credit hours)

HIST 111	United States History to 1877	3 cr.
HIST 112	United States History, 1878 to the Present	3 cr.
HIST 205	World History, Prehistory-1500CE	3 cr.
HIST 206	World History, 1500CE-Present	3 cr.
HIST 289	Sophomore Methods Seminar	3 cr.
HIST 490	Junior and Senior Seminar in History	4 cr.

**Subtotal: 19**

Twenty-one credit hours of history of which at least 12 credit hours must be at the 300-level.

These 21 hours must include at least six hours each of courses in non-Western, European, and American history.

**Subtotal: 21**

Eighteen additional credit hours in social sciences including at least three credit hours each of economics, geography, political science, sociology, and psychology.

**Subtotal: 18**

Subtotal: 58

Total Credit Hours: 58

The 2.0 required grade point average in the major is based upon all HIST courses pursued as a part of the student's degree program.

## History Suggested Sequence of Courses

The schedule of courses below is a sample sequence for a history major. Many students become history majors in their sophomore year and fulfill the major requirements without academic sacrifice.

## Degree Requirements

## Freshman Year- Fall Semester

HIST 205	World History, Prehistory-1500CE	3 cr.
HIST 111	United States History to 1877	3 cr.
MATH 1XX	Mathematical Analysis	3 cr.
ENGL 132	English Composition I	3 cr.
LA 110	First Year Seminar Arts & Sciences	3 cr.

**Subtotal: 15**

## Freshman Year - Spring Semester

HIST 206	World History, 1500CE-Present	3 cr.
HIST 112	United States History, 1878 to the Present	3 cr.

MATH XXX	Mathematics Elective	3 cr.
GEN XXX	General Elective	3 cr.
ENGL 133	English Composition II	3 cr.

**Subtotal: 15**

Sophomore Year - Fall Semester

POSC XXX	Political Science	3 cr.
EC xxx	Economics Elective	3 cr.
LAB XXX	Laboratory Science Requirement	3 cr.
HIST 289	Sophomore Methods Seminar	3 cr.
GUR xxx	General University Requirement	3 cr.

**Subtotal: 15**

Sophomore Year - Spring Semester

SO XXX	Sociology Elective	3 cr.
GUR xxx	General University Requirement	3 cr.
PSY XXX	Psychology Elective	3 cr.
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Junior Year - Fall Semester

GUR xxx	General University Requirement	3 cr.
HIST 3XX	Upper Level History Elective	3 cr.
HIST 3XX	Upper Level History Elective	3 cr.
GUR xxx	General University Requirement	3 cr.
GEOG xxx	World Geography Elective	3 cr.

**Subtotal: 15**

Junior Year - Spring Semester

HIST 3XX	Upper Level History Elective	3 cr.
HIST 3XX	Upper Level History Elective	3 cr.
SBP XXX	Social/Behavioral Sciences Perspective	3 cr.
GEN XXX	General Elective	3 cr.
HIST xxx	History Elective	3 cr.

**Subtotal: 15**

Senior Year - Fall Semester

HIST 3XX	Upper Level History Elective	3 cr.
HIST 3XX	Upper Level History Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Senior Year - Spring Semester

HIST 3XX	Upper Level History Elective	3 cr.
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GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
HIST 490	Junior and Senior Seminar in History	4 cr.

**Subtotal: 16**

Subtotal: 121

Total Credit Hours: 121

\*Two courses must be designated as writing intensive courses.

Information Technology

**Information Technology Major**

**General Information**

The Information Technology major, which leads to a Bachelor of Science degree, prepares students to be able to identify and employ the information technology and methodologies required to help an organization meet its goals. Students are prepared to understand and meet the technology needs of users in an organization while being able to select, apply, integrate and administer computing technologies within the organization. Students are prepared to advocate for the users as well as to administer computer systems, manage networks of computers, design and develop web pages, and develop network and system security strategies for an organization. Due to the rapid rate of change in technology, students are equipped to understand and manage the information technology resources of an organization in an environment of change as new technologies emerge. Students will gain hands-on experience with a range of information technologies. An internship is required to provide students with an understanding of how information technology is used in the real world.

**Opportunities**

Graduates in Information Technology develop the knowledge and understanding required of IT professionals and are prepared to go on to advanced study or to enter various information technology fields. Graduates are in high demand and are well equipped to enter careers in system administration, web design and development, network administration, and cybersecurity.

**Computer Science and Information Technology Faculty**

**Educational Objectives**

The Information Technology program will prepare students to be professionals capable of applying principles to practice, able to undertake lifelong learning, and aware of social, ethical, and environmental issues associated with their professional activities. The expected accomplishments of our graduates during the first several years following graduation from the program are to:

1. successfully apply principles and practices of computing to design and maintain systems that meet customer need and support user needs;
2. function ethically and responsibly as a full participant in the computing discipline;
3. remain current in the fast-changing world of technology today by pursuing lifelong learning;
4. operate successfully as part of a team; and
5. apply knowledge and skills to the benefit of society.

**Program Outcomes**

Upon completion of the program, the student will have the following abilities:

- Communication—Ability to communicate ideas and concepts in written and oral forms clearly and in an organized manner.
- Mathematical Foundations —Ability to apply knowledge of computing and mathematical concepts and theory to develop and analyze computing systems.
- Teamwork —Ability to work in teams.
- Design—Ability to apply design process and notation in order to design systems.
- Critical Thinking —Ability to evaluate and analyze a computer-based system, process, component, or program to meet desired needs.
- Ethics—Ability to identify the role computers play in society and identify and analyze ethical impacts of professional behavior and actions.
- Information Management —Ability to identify and utilize appropriate information sources in order to understand and/or solve problems.
- Programming Fundamentals—Ability to create solutions to problems using code and/or components including selection of programming fundamentals and appropriate comments.

**General University and College Requirements**

See General University Requirements (p. 33) and College of Arts and Sciences Requirements (p. 41).

**Degree Requirements**

Required information technology courses (27 credit hours)

CS 101/IT 101	Introduction to Computing	4 cr.
IT 102/CS 102	Introduction to Programming	4 cr.
CS 200/IT 200	Data Structures	4 cr.
IT 230	Introduction to Operating Systems and Script Development	3 cr.
IT 240	Foundations of Web Systems	3 cr.
IT 250/BIS 413	Data Communications and Networks	3 cr.
IT 320	Foundations of Human Computer Interaction	3 cr.
	And	
IT 300/BIS 321	Database Management Systems	3 cr.
	or	
CS 364	Design of Database Management Systems	3 cr.
		<b>Subtotal: 27</b>

Required mathematics courses (6 credit hours)

MATH 120	Intro Statistics for the Arts & Sciences	3 cr.
MATH 150	Applied Discrete Mathematics	3 cr.
		<b>Subtotal: 6</b>

Technical Elective (6 credit hours)

Two additional information technology or computer science courses numbered 300 or above.

**Subtotal: 6**

Required Philosophy Course (3 credits)

PH 225	Ethics of Digital Technologies	3 cr.
		<b>Subtotal: 3</b>

Internship (3 credit hours)

IT 480	Internship in Information Technology	3 cr.
		<b>Subtotal: 3</b>

Subtotal: 45

Total Credit Hours: 45

In addition to the courses, students must complete two concentration areas taking two courses for each of their chosen concentrations and an additional course in a third concentration area. See Information Technology Concentrations (p. 90).

**Information Technology Concentrations (15 credit hours)**

**Degree Requirements**

Area I - System Administration:

IT 310	System Operation and Administration	3 cr.
IT 410	Advanced Topics in System Administration	3 cr.

Area 2 - Cybersecurity:

IT 330	Fundamentals of Cybersecurity	3 cr.
IT 430	Ethical Hacking	3 cr.

Area 3 - Web Design and Development:

IT 350	Web Systems Development	3 cr.
IT 450	Advanced Topics in Web Design and Development	3 cr.

Area 4 - Network Administration:

IT 360	Network Management and Operations	3 cr.
IT 460	Advanced Topics in Network Administration	3 cr.

Total Credit Hours: 15

**Information Technology Suggested Sequence of Courses**

**Degree Requirements**

Freshman Year- Fall Semester

IT 101/CS 101	Introduction to Computing	4 cr.
GEN XXX	General Elective	3 cr.
ENGL 132	English Composition I	3 cr.

LA 100	First Year Seminar	2 cr.
GUR xxx	General University Requirement	3 cr.
		<b>Subtotal: 15</b>

Freshman Year - Spring Semester

IT 102/CS 102	Introduction to Programming	4 cr.
MATH 150	Applied Discrete Mathematics	3 cr.
ENGL 133	English Composition II	3 cr.
GEN XXX	General Elective	3 cr.
GUR xxx	General University Requirement	3 cr.
		<b>Subtotal: 16</b>

Sophomore Year - Fall Semester

IT 200/CS 200	Data Structures	4 cr.
IT 230	Introduction to Operating Systems and Script Development	3 cr.
MATH 120	Intro Statistics for the Arts & Sciences	3 cr.
WIC 2XX	Writing Intensive Course	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 16</b>

Sophomore Year - Spring Semester

IT 240	Foundations of Web Systems	3 cr.
IT 250/BIS 413	Data Communications and Networks	3 cr.
GUR xxx	General University Requirement	3 cr.
GUR xxx	General University Requirement	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 15</b>

Junior Year - Fall Semester

IT 3XX	IT Concentration Area 1	3 cr.
IT 3XX	IT Concentration Area 2	3 cr.
IT 300/BIS 321	Database Management Systems	3 cr.
GUR xxx	General University Requirement	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 15</b>

Junior Year - Spring Semester

IT 4XX	IT Concentration Area 1	3 cr.
IT 4XX	IT Concentration Area 2	3 cr.
PH 225	Ethics of Digital Technologies	3 cr.
GUR xxx	General University Requirement	3 cr.
WIC 3xx-4xx	Writing Intensive Course	3 cr.
		<b>Subtotal: 15</b>

Senior Year - Fall Semester

IT 320	Foundations of Human Computer Interaction	3 cr.
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IT XXX	IT Concentration Area 3	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
IT/CS 3XX/4XX	IT Electives	3 cr.

**Subtotal: 15**

Senior Year - Spring Semester

IT/CS 3XX/4XX	IT Electives	3 cr.
IT 480	Internship in Information Technology	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	1 cr.

**Subtotal: 13**

Subtotal: 120

Total Credit Hours: 120

Note: Order of General University Requirement courses can be altered (HIST, LAB, NSP, SBP, ART, CUL).

The Computer Competence GUR is met through IT 102/CS 102; the Ethical Perspective is met through PH 225.

Integrated Liberal Studies

Integrated Liberal Studies Major

**General Information**

The Integrated Liberal Studies program provides the opportunity to construct an individualized major. Such a program combines a selection of interrelated courses from two or more disciplines according to the interests and goals of the student.

Students must request permission and guidance from each department in which they propose to do a substantial part of the work. Final approval of such a program rests with the Dean of the College of Arts and Sciences upon recommendation of those departments concerned. No request for an Integrated Liberal Studies major will be considered earlier than the end of the freshman year or later than the beginning of the senior year.

**Career Opportunities**

This program permits students to pursue goals, which are not addressed in a regular major program. Past majors have found jobs in animal science, publishing, and pharmaceutical sales.

**Faculty**

Faculty in this major are drawn from disciplines throughout the University.

**Program Objectives**

1. To allow students to construct a major.
2. To gather courses from at least two major departments.
3. To lead students to define educational goals.
4. To bring the students into planning their own education.

- To lead students to find elements in disciplines that reinforce each other.

**General University and College Requirements**

See General University Requirements (p. 18) and College of Arts and Sciences Requirements (p. 41).

Non-business majors can apply no more than 25% of business coursework to their graduation requirements.

Minimum requirements for an integrated liberal studies major:

A minimum of 36 credit hours drawn from at least two disciplines, 18 hours in each discipline. At least 30 (15 hours in each) of these shall be courses at the 300-400 level.

**Suggested Sequence of Courses**

The Assistant Dean of Arts and Sciences serves as the advisor to students in this major. Each student’s four-year sequence is dependent upon the courses of study selected.

International Studies

**International Studies Major**

**General Information**

International Studies aims to educate global citizens. The major promotes global understanding and lifelong learning through an international, intercultural, and interdisciplinary curriculum. It is designed to foster understanding of world societies and global issues from varied disciplinary perspectives, including cultural diversity and norms, economic interconnectedness, conflict and war, environmental degradation, human rights violations and solutions. Students learn the communication, research, and critical thinking skills necessary to assess cultural, economic, political, and social systems in a global context. Majors learn to understand and communicate with diverse communities at home and abroad, a foundation of work and life in the twenty-first century, by studying complex international issues, including the dynamic global economy and the expectations of global citizenship.

International Studies majors shape their own course of study from a curriculum that balances depth and breadth of international and regionally comparative courses in different academic specializations. Majors are encouraged to choose a relevant minor to focus their course of study. Majors are encouraged to study abroad or to pursue international or globally related internships and service learning opportunities. International Studies advances awareness of global issues on campus by promoting participation in student organizations that support international understanding and diversity education, especially the Model United Nations and United and Mutually Equal.

**Career and Community Opportunities**

International Studies prepares students to participate creatively in a global exchange of ideas and to be successful in a dynamic global economy. The major opens a wide variety of career paths, ranging from public service, diplomacy, management, and communications to the arts, community service, entrepreneurship, health care support, and teaching. It prepares interested students for a variety of graduate programs, including those in international affairs, law, business, and public policy. The major helps students meet the challenges of the global economy by requiring at least twelve credits of foreign language(s). The major also encourages studying, volunteering, and interning abroad to sharpen students’ critical thinking and communication skills, which most employers consider fundamental in the twenty-first century economy.

**Faculty**

In this multidisciplinary major, students will learn from faculty in many disciplines from throughout the University.

**Program Objectives**

- To provide students with breadth of knowledge of cultural, economic, political, and social systems in a global context.
- To provide students with analytical tools to explain complex global issues in different disciplines.
- To expose students at an advanced level to different disciplinary perspectives on global issues and international context.
- To acquire proficiency in a language or languages other than one’s own.
- To gain awareness of the connection between global problems and global citizenship, particularly, but not necessarily, through international study, internships, or service learning, or through globally related internships, service learning, or domestic academic exchange.
- To develop skills in critical reading, research, argumentation, and presentation.

**General University and College Requirements**

See General University Requirements (p. 33) and College of Arts and Sciences Requirements (p. 41). International Studies majors are encouraged to fulfill General University Requirements with courses that have international, global, or comparative focus.

**Degree Requirements**

Group A: Core courses required (15 credit hours):

GEOG 102	World Regional Geography I: Highly Developed Countries	3 cr.
	or	
GEOG 103	World Regional Geography II: Less Developed Countries	3 cr.
HIST 206	World History, 1500CE-Present	3 cr.
INST 101/POSC 101	Introduction to Contemporary Global Issues	3 cr.
POSC 203	International Relations	3 cr.
INST 490	Seminar in International Studies	3 cr.

**Subtotal: 15**

Group B: Choose at least four courses; these cannot also count as Core courses (12 credit hours):

- ART 212/HIST 212
- ART 202
- CJ 260
- COMM 235
- EC 111
- EC 112
- \*ENGL 215
- \*ENGL 232
- GEOG 102

GEOG 103  
 HIST 133  
 HIST 171  
 HIST 212/ART 212  
 HIST 261  
 INST 100  
 INST 190  
 INST 290  
 INTB 251  
 LSOC 203  
 MUS 240  
 PH 120  
 PH 214  
 PH 230  
 PH 240  
 POSC 201  
 POSC 235  
 POSC 2XX

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**Subtotal: 12**

Group C: Choose at least seven courses; note any prerequisites (21 credit hours):

COMM 348  
 COMM 356  
 EC 315  
 EC 321  
 EC 371  
 EC 372  
 EC 3XX  
 EC 39X  
 \*ENGL 336  
 \*ENGL 341  
 \*ENGL 343  
 \*ENGL 376  
 ENTR 380  
 FILM 312  
 FIN 322  
 HIST 320  
 HIST 332  
 HIST 341  
 HIST 343  
 HIST 345  
 HIST 346  
 HIST 372  
 HIST 373  
 HIST 374/INST 374  
 HIST 375  
 HIST 380  
 HIST 39X (topics vary; INTLS Dir. approval)  
 \*HIST 490 (topics vary; INTLS Dir. approval)  
 INST 390  
 INST 480  
 LSOC 344  
 MAN 311  
 MK 311  
 PH 316  
 POSC 310  
 POSC 312  
 POSC 316  
 POSC 318  
 POSC 340  
 \*POSC 345  
 POSC 346  
 POSC 350  
 POSC 355

POSC 356  
 POSC 39X (topics vary; INTLS Dir. approval)  
 POSC 490 (topics vary; INTLS Dir. approval)  
 SPMN 420

\*Fulfills Writing Intensive Requirement. Two courses must be designated as writing intensive.

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**Subtotal: 21**

**Foreign Languages requirement (12 crs)**

At least 12 credits (four semesters) of a foreign language or languages are required. A student may earn exemption from up to two semesters of a foreign language and up to two semesters of a different native language other than English. Exemptions may be earned through a proficiency test administered and/or approved by an appropriate University faculty member or the Director of International Studies.

Students who earn the maximum language exemption will be required to take one course from Group C above. The remaining credits will become general electives.

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**Subtotal: 12**

Subtotal: 60

Total Credit Hours: 60

**International Studies Suggested Sequence of Courses**

**Degree Requirements**

**Freshman Year - Fall Semester**

ENGL 132	English Composition I	3 cr.
INST 101/POSC 101	Introduction to Contemporary Global Issues	3 cr.
LA 110	First Year Seminar Arts & Sciences	3 cr.
LANG XXX	First Semester Foreign Language	3 cr.
MATH 1XX	Mathematical Analysis	3 cr.

**Subtotal: 15**

**Freshman Year - Spring Semester**

ENGL 133	English Composition II	3 cr.
GEOG 1xx	World Geography Elective	3 cr.
HIST 206	World History, 1500CE-Present	3 cr.
LANG XXX	First Semester Foreign Language	3 cr.
MATH 1XX	Mathematical Analysis	3 cr.

**Subtotal: 15**

**Sophomore Year - Fall Semester**

INST 1-2XX	See INST Curriculum List	3 cr.
INST 1-2XX	See INST Curriculum List	3 cr.

GUR xxx	General University Requirement	3 cr
PH 1-2XX	See INST Curriculum List	3 cr.
WIC 2XX	Writing Intensive Course	3 cr.
GUR xxx	General University Requirement	3 cr

**Subtotal: 18**

## Sophomore Year - Spring Semester

GUR xxx	General University Requirement	3 cr
INST XXX	See INST Curriculum List	3 cr.
INST XXX	See INST Curriculum List	3 cr.
GUR xxx	General University Requirement	3 cr
POSC 203	International Relations	3 cr.

**Subtotal: 15**

## Junior Year - Fall Semester (Study Abroad Encouraged)

ART/FILM/MUS/THTR XXX	See INST Curriculum List	3 cr.
INST 3XX	See INST Curriculum List	3 cr.
INST 3XX	See INST Curriculum List	3 cr.
GEN XXX	General Elective	3 cr.
LANG XXX	Foreign Language	3 cr.

**Subtotal: 15**

## Junior Year - Spring Semester (Study Abroad Encouraged)

GUR xxx	General University Requirement	3 cr
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
INST 3XX	See INST Curriculum List	3 cr.
LANG XXX	Foreign Language	3 cr.

**Subtotal: 15**

## Senior Year - Fall Semester

GEN 3XX	General Elective	3 cr.
GEN 3XX	General Elective	3 cr.
GEN XXX	General Elective	1 cr.
INST 3XX	See INST Curriculum List	3 cr.
INST 3XX	See INST Curriculum List	3 cr.
WIC 3XX	Writing Intensive Course	3 cr.

**Subtotal: 16**

## Senior Year - Spring Semester

GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
INST 3XX	See INST Curriculum List	3 cr.
INST 490	Seminar in International Studies	3 cr.

**Subtotal: 15**

Subtotal: 124

Total Credit Hours: 124

\*Two courses must be designated as writing intensive courses.

## Law and Society

## Law and Society Major

## General Information

The Law and Society major is a course of study for the liberal arts student who is interested in studying the origins, actors, institutional frameworks, cultural development, and theoretical foundations of law and justice as they relate to society. The study of law and society draws from the insights and tools of academic disciplines like history, political science, philosophy, sociology, economics, and related social sciences, to illuminate the development and practice of law and jurisprudence through a variety of legal traditions. This major looks at law, broadly construed, and legal actors and institutions in a wide variety of contexts: domestic (i.e., United States), foreign, and international.

This is an interdisciplinary major, so students in this program are not confined to learning about law through the narrow prism of one particular discipline. The goal of the program is to allow students the freedom to sample from a wide variety of courses and instructors and to pursue specific interests within a broad organizing framework—the law.

## Career Opportunities

The goal of the program is to produce students who can think clearly and dissect and analyze arguments critically. The multidisciplinary approach exposes students to a great variety of human behaviors and institutions. The Law and Society major is not designed to be the only path for preparing students for law school, nor does it provide paralegal training, but many students who plan to attend law school may benefit from and enjoy this major as a field of study. The broadly based education offered by this major is an excellent preparation for careers in law, education, government, business, and international affairs.

## Faculty

## Program Objectives

1. Understand law in its various theoretical, institutional, and historical forms and as it exists in practice.
2. Consider how various historical, social, economic, and political contexts shape the construction, mobilization, and interpretation of law.
3. Develop an appreciation for international law and for non-Western legal traditions from the Middle East, Sub-Saharan Africa, South Asia, and East Asia.
4. Understand the comparative development and practice of constitutional law in the United States and other societies.
5. Perceive the dynamic relationship between law, society, and politics on a local, national, and international level.
6. Understand the development and dynamics of legal institutions and practices in the United States and elsewhere in an increasingly globalizing world.

## General University and College Requirements

See General University Requirements (p. 33) and College of Arts and Sciences Requirements (p. 41).

### Degree Requirements

Required law and society courses (37 credit hours)

LSOC 101	Law & Society I: Introduction to Law & Society	3 cr.
LSOC 102	Law & Society II: Legal Justice and Social Justice	3 cr.
POSC 102	American National Government	3 cr.
POSC 201	Comparative Politics	3 cr.
POSC 207/LSOC 207/PH 207	Introduction to Political Theory	3 cr.
POSC 225/LSOC 225	Law and Judicial Politics	3 cr.
LSOC 226/POSC 226	The Legal Profession	3 cr.
LSOC 307/POSC 307	Justice, Diversity, and Democratic Citizenship	3 cr.
POSC 325/LSOC 325	Constitutional Law	3 cr.
POSC 340/LSOC 340	International Governance and Law	3 cr.
LSOC 344	Comparative Legal Systems	3 cr.
LSOC 490	Senior Seminar in Law and Society	4 cr.

**Subtotal: 37**

The major will require that the student select four courses (12 credits)

The major will require the student select four courses (12 credits) from any combination of the following:

BL 201/HONB 201	Introduction to Business Law	3 cr.
ILP 253	Justice Then and Now	3 cr.
ENGL 366	Crime and Punishment	3 cr.
LSOC 330	Contemporary Political Theory	3 cr.
PH 208	Ethics	3 cr.
PH 240/REL 240	Gandhi and King	3 cr.
PH 245	War, Terrorism and Torture	3 cr.
POSC 203	International Relations	3 cr.
POSC 205	Public Administration	3 cr.
POSC 210	State and Local Politics	3 cr.
POSC 212	Political Analysis	3 cr.
POSC 218	Public Policy in America	3 cr.
POSC 235/COMM 235	British Press and Politics	3 cr.
POSC 310	Politics of Developing Societies	3 cr.
POSC 312	Politics of Sub-Saharan Africa	3 cr.
POSC 316	Politics of Europe	3 cr.

POSC 318	Politics of The Middle East	3 cr.
POSC 322	The U.S. Presidency	3 cr.
POSC 324	Parties and Elections	3 cr.
POSC 327	Media & Politics	3 cr.
POSC 328	Political Behavior	3 cr.
POSC 342	Environmental Politics	3 cr.
POSC 345	International Human Rights	3 cr.
POSC 356	Human Security	3 cr.
SO 208	Gender	3 cr.
SO 211	Race and Ethnicity	3 cr.
SO 309/CJ 309	Deviance	3 cr.
SO 413	Social Inequality	3 cr.
SW 204	Social Work and Criminal Justice	3 cr.

**Subtotal: 12**

The student will also be required to take courses outside the major as follows:

EC 111	Principles of Microeconomics	3 cr.
SO 101	Introduction to Sociology	3 cr.

**Subtotal: 6**

Subtotal: 55

Total Credit Hours: 55

### Law and Society Suggested Sequence of Courses

#### Degree Requirements

Freshman Year- Fall Semester

LSOC 101	Law & Society I: Introduction to Law & Society	3 cr.
POSC 102	American National Government	3 cr.
ENGL 132	English Composition I	3 cr.
MATH 1XX	Mathematical Analysis	3 cr.
LA 110	First Year Seminar Arts & Sciences	3 cr.

**Subtotal: 15**

Freshman Year - Spring Semester

LSOC 102	Law & Society II: Legal Justice and Social Justice	3 cr.
SO 101	Introduction to Sociology	3 cr.
ENGL 133	English Composition II	3 cr.
MATH XXX	Mathematical Analysis	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Sophomore Year - Fall Semester

LAB XXX	Laboratory Science Requirement	3-4 cr.
POSC 225/LSOC 225	Law and Judicial Politics	3 cr.



EC 111	Principles of Microeconomics	3 cr.
POSC 201	Comparative Politics	3 cr.
XXX	Major Elective	3 cr.
	or	
LSOC 207/POSC 207/PH 207	Introduction to Political Theory	3 cr.

**Subtotal: 15-16**

## Sophomore Year - Spring Semester

LSOC 226/POSC 226	The Legal Profession	3 cr.
GEN XXX	General Elective	3 cr.
LAB XXX	Laboratory Science Requirement	3 cr.
XXX	Major Elective	3 cr.
XXX	Major Elective	3 cr.

**Subtotal: 15**

## Junior Year - Fall Semester

POSC 325/LSOC 325	Constitutional Law	3 cr.
CS 13X	Computer Competence	3 cr.
	or	
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.
LSOC 207/POSC 207/PH 207	Introduction to Political Theory	3 cr.
	or	
XXX	Major Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
	or	
XXX	Major Elective	3 cr.

**Subtotal: 15**

## Junior Year - Spring Semester

POSC 340/LSOC 340	International Governance and Law	3 cr.
	or	
LSOC 344	Comparative Legal Systems	3 cr.
LSOC 307/POSC 307	Justice, Diversity, and Democratic Citizenship	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
CUL XXX	Global Cultures Perspective	3 cr.

**Subtotal: 15**

## Senior Year - Fall Semester

XXX	Major Elective	3 cr.
ART XXX	Aesthetic Perspective	3 cr.
GEN XXX	General Elective	3 cr.
PH XXX	Ethical Perspective	3 cr.
XXX	Major Elective	3 cr.

**Subtotal: 15**

## Senior Year - Spring Semester

LSOC 344	Comparative Legal Systems	3 cr.
	or	
LSOC 340/POSC 340	International Governance and Law	3 cr.
LSOC 490	Senior Seminar in Law and Society	4 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 16**

Subtotal: 121-122

Total Credit Hours: 121-122

\*Two courses must be designated as writing intensive courses.

## Liberal Studies

## Liberal Studies Major

**General Information**

The Liberal Studies programs are open only to part-time students (no more than 11 credits per semester).

**Program Objectives**

1. To provide a wide array of courses.
2. To present a well balanced program of courses.
3. To frame (for the associate's degree) a realistic, near-term goal.
4. To allow students to make maximum use of courses taken.

**Associate of Arts in Liberal Studies**

The Associate of Arts in Liberal Studies is particularly appropriate for nontraditional students who are entering or reentering college after a long pause in their formal education. The two-year degree may be designed by the student, with the assistance of an academic advisor, to serve as a career development tool as well as preparation for upper-level study in a four-year degree program.

**Bachelor of Arts in Liberal Studies**

The Bachelor of Arts in Liberal Studies satisfies the broad interests of older students who wish to further their formal education without reference to specific career preparation or as preparation for graduate study. Advisors can give more information and guidance on this flexible degree option.

**General University and College Requirements**

See General University Requirements (p. 33) and College of Arts and Sciences Requirements (p. 41).

Non-business majors can apply no more than 25% of business coursework to their graduation requirements.

Candidates for the Bachelor of Arts in Liberal Studies must meet all general requirements of the University and area requirements of the College of Arts and Sciences.

### Degree Requirements

Associate of Arts in Liberal Studies - Course of Study (60 credit hours)

ENGL xxx	Freshman English	6 cr.
WIC XXX	Writing Intensive course	3 cr.
xxx	Humanities	9 cr.
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.
xxx	Mathematics	3 cr.
xxx	Mathematics or Computer	3 cr.
xxx	Social Sciences	12 cr.
GEN XXX	General Electives	21 cr.

**Subtotal: 60**

Bachelor of Arts in Liberal Studies - Course of Study (120 credit hours)

ART XXX	Aesthetic Perspective	3 cr.
CUL XXX	Global Cultures Perspective	3 cr.
PH XXX	Philosophy Elective	3 cr.
CS XXX	Computer Science	3 cr.
ENGL xxx	Freshman English	6 cr.
WIC XXX	Writing Intensive course	6 cr.
HIST XXX	History	3 cr.
POSC XXX	Political Science/Economics	3 cr.
PSY/SO XXX	Behavioral Science Perspective	3 cr.
xxx	Humanities	18 cr.
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.
LAB XXX	Laboratory Science	3 cr.
xxx	Mathematics	6 cr.
xxx	Social Sciences	21 cr.
GEN XXX	General Electives	36 cr.

**Subtotal: 120**

Humanities: 9 credit hours at 300-400 level

Social Sciences: 9 credit hours at 300-400 level

General Electives: 12 credit hours at 300-400 level

Mathematical Sciences

### Mathematical Sciences Major

#### General Information

The primary goals of the Mathematical Sciences curriculum are to offer general training in mathematical reasoning and to develop

mastery of mathematical tools needed for a lifelong series of different jobs and continuing education. Much emphasis is placed on the theory of problem-solving and nurturing such abilities as intuition, inductive and deductive reasoning, and model building. The student is also made aware of the power and elegance of mathematical truth through careful analysis of axiomatic systems and mathematical theories. Throughout the undergraduate program students are encouraged to formulate their own problems and conjectures, thus challenging their own ability to cope with the mathematical literature.

In fostering these goals the Mathematical Sciences curriculum provides grounding in the traditional areas of theoretical mathematics. It also allows student the flexibility of choosing elective courses based on future career or graduate school goals. In the senior year, students work individually with a faculty member on their self-selected senior project, which culminates in a research paper and a presentation, usually at the Hudson River Undergraduate Mathematics Conference. For interested students, there can be the opportunity to do research with a faculty member before senior year. The programs lead to a Bachelor of Science in the Mathematical Sciences, including if pursuing the teacher preparation-secondary school major, or a Bachelor of Arts in Mathematics, if pursuing the teacher preparation-elementary major. The programs have been patterned to follow the recommendations of the Committee on Undergraduate Programming in Mathematics of the Mathematical Association of America.

#### Program Objectives

The Mathematical Sciences curriculum provides instruction and support for students in achieving the following objectives. It is our purpose that our students:

- 1) Learn mathematical habits of mind
  - a. Correctly apply inductive and deductive reasoning skills.
  - b. Demonstrate correct use of formal mathematical language and ability to compose a mathematical proof.
  - c. Demonstrate the ability to successfully apply mathematical computations and algorithms.
  - d. Demonstrate the ability to do mathematical work independently, and to go beyond the content level of standard coursework.
- 2) Demonstrate fluency in mathematical communication.
  - a. Write about mathematics correctly and in a clear manner.
  - b. Communicate mathematics orally in a clear manner.
- 3) Use technology relevant to mathematics.
  - a. Use technology to solve mathematical problems.
  - b. Use technology to communicate mathematics effectively.

#### Career Opportunities

Graduates in mathematics develop the type of creative thinking and problem-solving abilities required of professional mathematicians. As a consequence, they are well prepared to complete advanced study or pursue a wide variety of employment opportunities in industry, commerce, or the public sector. Graduates have secured positions in

the areas of actuarial science, finance, operations research, computer programming, statistics, systems analysis, software engineering, and teaching. Others have received fellowships to pursue graduate study in mathematics or related areas.

**Mathematics Faculty** (p. 40)

**Degree Requirements**

Required mathematics and other courses (36 - 37 credit hours)

for the Bachelor of Science degree in the Mathematical Sciences:

CS 170	Technology in Mathematics	3 cr.
CS 171	Programming for Mathematics	4 cr.
MATH 121	Introductory Probability and Statistics	3 cr.
MATH 127	Calculus I with Pre-Calculus Review	5 cr.
or		
MATH 133	Calculus I	4 cr.
MATH 134	Calculus II	4 cr.
MATH 235	Calculus III	3 cr.
MATH 281	Foundations of Mathematics I	3 cr.
MATH 306	Linear Algebra	3 cr.
MATH 418	Introduction to Modern Algebra	3 cr.
MATH 421	Real Analysis	3 cr.
MATH 451	Senior Project I	1 cr.
MATH 452	Senior Project II	2 cr.
		<b>Subtotal: 36-37</b>

In addition, the student must take 12 credit hours (four courses) of mathematics electives selected from 300- and 400-level MATH courses.

**Teacher Preparation-Secondary School**

If pursuing the Teacher Preparation-Secondary School major, 12 additional credit hours as follows:

MATH 121	Introductory Probability and Statistics	3 cr.
MATH 371	Modern Aspects of Geometry	3 cr.
MATH 375	Creative Problem Solving	3 cr.
MATH 377	Elementary Number Theory	3 cr.
		<b>Subtotal: 12</b>

**Teacher Preparation - Elementary School (41 credits)**

Required mathematics and other courses for the Bachelor of Arts degree in Mathematical Sciences.

CS 170	Technology in Mathematics	3 cr.
MATH 107	Mathematics For Elementary Education I	3 cr.

MATH 108	Mathematics for Elementary Education II	3 cr.
MATH 121	Introductory Probability and Statistics	3 cr.
MATH 133	Calculus I	4 cr.
MATH 134	Calculus II	4 cr.
MATH 235	Calculus III	3 cr.
MATH 281	Foundations of Mathematics I	3 cr.
MATH 306	Linear Algebra	3 cr.
MATH 371	Modern Aspects of Geometry	3 cr.
MATH 377	Elementary Number Theory	3 cr.
MATH 451	Senior Project I	1 cr.
MATH 452	Senior Project II	2 cr.

**Subtotal: 38**

Note: Concurrent completion of the Elementary Education major, which yields a Bachelor of Arts Degree in Elementary Education, is required for the Teacher Preparation - Elementary School major.

For the Mathematical Sciences major, including if pursuing the Teacher Preparation-Secondary School option, taking PH 204 Symbolic Logic in the spring semester of the freshman year is recommended as good preparation for MATH 281. In addition, for those pursuing the Teacher Preparation-Secondary School option, taking MATH 302 MTEL Prep in the fall semester of the sophomore year is recommended as good preparation for taking the MTEL exam.

**Bachelor of Science in the Mathematical Sciences Suggested Sequence of Courses**

**Degree Requirements**

**Freshman Year - Fall Semester**

ENGL 132	English Composition I	3 cr.
MATH 127	Calculus I with Pre-Calculus Review	5 cr.
or		
MATH 133	Calculus I	4 cr.
LA 100	First Year Seminar	2 cr.
GUR xxx	General University Requirement	3 cr.
GUR xxx	General University Requirement	3 cr.
		<b>Subtotal: 15-16</b>

**Freshman Year - Spring Semester**

CS 170	Technology in Mathematics	3 cr.
ENGL 133	English Composition II	3 cr.
MATH 121	Introductory Probability and Statistics	3 cr.
MATH 134	Calculus II	4 cr.
GUR xxx	General University Requirement	3 cr.

<b>Subtotal: 16</b>		
Sophomore Year - Fall Semester		
MATH 281	Foundations of Mathematics I	3 cr.
MATH 235	Calculus III	3 cr.
GUR xxx	General University Requirement	3 cr
GUR xxx	General University Requirement	3 cr
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Sophomore Year - Spring Semester		
MATH 306	Linear Algebra	3 cr.
CS 171	Programming for Mathematics	4 cr.
WIC 2XX	Writing Intensive Course	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 16**

Junior Year - Fall Semester		
MATH 418	Introduction to Modern Algebra	3 cr.
MATH 3xx-4xx	Mathematics Elective	3 cr.
GUR xxx	General University Requirement	3 cr
GUR xxx	General University Requirement	3 cr
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Junior Year - Spring Semester		
MATH 421	Real Analysis	3 cr.
MATH 3xx-4xx	Mathematics Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Senior Year - Fall Semester		
MATH 451	Senior Project I	1 cr.
MATH 3xx-4xx	Mathematics Elective	3 cr.
GEN 3XX/4XX	Upper Level General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	1 cr.

**Subtotal: 14**

Senior Year - Spring Semester		
MATH 452	Senior Project II	2 cr.
MATH 3xx-4xx	Mathematics Elective	3 cr.
GEN 3XX/4XX	Upper Level General Elective	3 cr.
GEN XXX	General Elective	3 cr.

GEN XXX	General Elective	3 cr.
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**Subtotal: 14**

Subtotal: 120-121

Total Credit Hours: 120-121

Note: The order of the General University Requirement courses can be altered (ARTS, CUL, HIST, LAB, LAB/NSP, PH, SBP).

### Bachelor of Science in the Mathematical Sciences, Teacher Preparation - Secondary School, Suggested Sequence of Courses

#### Degree Requirements

See Bachelor of Science in the Mathematical Sciences, Teacher Preparation - Secondary School, Suggested Sequence of Courses (p. 69)

### Bachelor of Arts in the Mathematical Sciences, Teacher Preparation-Elementary School Suggested Sequence of Courses

#### Degree Requirements

See Mathematical Sciences Teacher Preparation - Elementary School (p. 63)

Note: Concurrent completion of the Elementary Education major, which yields a Bachelor of Arts Degree in Elementary Education, is required for the Teacher Preparation - Elementary School Track.

#### Neuroscience

#### Neuroscience Major

##### General Information

Neuroscience is a field of study that integrates psychology, biology, physics, and chemistry for the common goal of understanding the structure, development, and function of the brain and nervous system. Through research, neuroscientists are able to describe the normal function of electrical tissue. For example, improving our understanding of the brain allows us to understand and find ways to prevent or treat many devastating neurological and psychiatric disorders. Students majoring in neuroscience will have access to a range of tools including behavioral testing, electrophysiology, histology, and molecular biology, as they participate first-hand in basic exploratory research. Students are involved in all stages of research including project design, data collection, and results reporting. This major is housed in a research-rich environment that supports a curriculum steeped in scientific investigation, where students and faculty work as partners in research and education.

##### Career Opportunities

Students who receive an undergraduate degree in Neuroscience typically continue their studies at the master's or doctoral level or pursue advanced degrees in a variety of medical professions (e.g. MD, DDO, DDS, VDM, or OD). Career options include positions within neuroscience, psychiatry, medicine, academia, pharmaceuticals, forensic science, health and allied health

professionals, science writing and communications, and state and federal governmental science agencies (e.g. CIA, FBI, NIH, CDC, or FDA).

### Neuroscience Faculty

#### Student Competencies

As an undergraduate Neuroscience major, students will study the nervous system, and behavior and cognitive processes from a variety of perspectives. The Neuroscience major has been patterned to follow the recommendations of the advisory committee of the Faculty for Undergraduate Neuroscience. Students, at the point of graduation, should be able to demonstrate the following core competencies:

- an understanding of natural science and three major divisions within neuroscience (behavioral, cellular and molecular, and systems physiology)
- an understanding of experimental methodology, design, and data analysis
- an understanding of historical trends and theoretical perspectives that inform the field
- an advanced understanding of a particular area or areas of study within neuroscience
- critical thinking and independent thought
- the ability to communicate effectively
- the ability to discern and articulate a rationale for ethical conduct in research

#### General University and College Requirements

See General University Requirements (p. 33) and College of Arts and Sciences Requirements (p. 41).

#### Course of Study for BS

There are four categories of required courses for the Neuroscience major.

#### Degree Requirements

##### Core courses (28 credits)

PSY 101	Introduction to Psychology	3 cr.
NSCI 212	Introduction to Behavioral Neuroscience	3 cr.
PSY 207	Statistics for the Behavioral Sciences	3 cr.
NSCI 232	Research Methods in Neuroscience	3 cr.
NSCI 247	Scientific Communication	3 cr.
NSCI 267	Neurobiology	4 cr.
NSCI 312	Cognitive Neuroscience	3 cr.
NSCI 385	Neurodevelopment	3 cr.
NSCI 405	Seminar in Neuroscience	3 cr.

**Subtotal: 28**

##### Neuroscience electives (9 crs.)

Students must select three courses from within the Neuroscience program (NSCI 200 - 400 level) or from an approved list of electives from the departments of Psychology, Biology, Physics, or Chemistry.

**Subtotal: 9**

#### Neuroscience Tracks (17 credits)

A central mission of the Neuroscience major is to provide opportunities for students to work closely with sponsoring faculty to learn experimental techniques and engage in neuroscience research.

##### Track I - Research Intensive

Students will have the opportunity to rotate through labs to observe and become familiar with various research practices and theories. Students are then required to select a faculty sponsor to engage in research in a more concentrated capacity. After placement, students will engage in a year-long senior thesis project.

NSCI 250	Neuroscience Lab Rotation I	1 cr.
NSCI 251	Neuroscience Lab Rotation II	2 cr.
NSCI 350	Neuroscience Lab Placement I	3 cr.
NSCI 351	Neuroscience Lab Placement II	3 cr.
NSCI 450	Senior Neuroscience Thesis I	4 cr.
NSCI 451	Senior Neuroscience Thesis II	4 cr.

**Subtotal: 17**

##### Or Track II - Course Intensive

Students have the option to continue with the Neuroscience Major by completing additional upper level courses in Neuroscience or approved courses in other disciplines.

NSCI 250	Neuroscience Lab Rotation I	1 cr.
NSCI 251	Neuroscience Lab Rotation II	2 cr.
3XX/4XX	Fourteen 3xx/4xx credits in Neuroscience or approved courses	14 cr.

**Subtotal: 17**

#### Basic science and math courses (30 credits)

BIO 107	General Biology I	3 cr.
BIO 117	General Biology Laboratory I	1 cr.
BIO 108	General Biology II	3 cr.
BIO 118	General Biology Laboratory II	1 cr.
CHEM 105	General Chemistry I	4 cr.
CHEM 106	General Chemistry II	4 cr.
CHEM 209	Organic Chemistry I	3 cr.
CHEM 219	Organic Chemistry Laboratory I	1 cr.
CHEM 210	Organic Chemistry II	3 cr.
CHEM 220	Organic Chemistry Laboratory II	1 cr.
MATH 109	Precalculus Mathematics	3 cr.
	or	
MATH 123	Calculus I for Management, Life, and Social Sciences	3 cr.
MATH 120	Intro Statistics for the Arts & Sciences	3 cr.
	or	

MATH 124	Calculus II For Management, Life, and Social Sciences	3 cr.
		<b>Subtotal: 30</b>

Subtotal: 82

Total Credit Hours: 82

### Neuroscience Suggested Sequence of Courses

#### Degree Requirements

##### Freshman Year - Fall Semester

PSY 101	Introduction to Psychology	3 cr.
ENGL 132	English Composition I	3 cr.
BIO 107	General Biology I	3 cr.
BIO 117	General Biology Laboratory I	1 cr.
LA 100	First Year Seminar	2 cr.
MATH 109	Precalculus Mathematics	3 cr.
		or
MATH 123	Calculus I for Management, Life, and Social Sciences	3 cr.
		<b>Subtotal: 15</b>

##### Freshman Year - Spring Semester

NSCI 212	Introduction to Behavioral Neuroscience	3 cr.
ENGL 133	English Composition II	3 cr.
BIO 108	General Biology II	3 cr.
BIO 118	General Biology Laboratory II	1 cr.
MATH 120	Intro Statistics for the Arts & Sciences	3 cr.
		or
MATH 124	Calculus II For Management, Life, and Social Sciences	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 16</b>

##### Sophomore Year - Fall Semester

CS XXX	Computer Competence Requirement	3 cr.
NSCI 267	Neurobiology	4 cr.
PH XXX	Ethical Perspective	3 cr.
CHEM 105	General Chemistry I	4 cr.
NSCI 250	Neuroscience Lab Rotation I	1 cr.
		<b>Subtotal: 15</b>

##### Sophomore Year - Spring Semester

PSY 207	Statistics for the Behavioral Sciences	3 cr.
NSCI 2XX-4XX	Neuroscience Elective	3 cr.
CHEM 106	General Chemistry II	4 cr.

NSCI 247	Scientific Communication	3 cr.
NSCI 251	Neuroscience Lab Rotation II	2 cr.
		<b>Subtotal: 15</b>

##### Junior Year - Fall Semester

NSCI 312	Cognitive Neuroscience	3 cr.
CHEM 209	Organic Chemistry I	3 cr.
CHEM 219	Organic Chemistry Laboratory I	1 cr.
NSCI 232	Research Methods in Neuroscience	3 cr.
GEN XXX	General Elective	3 cr.
NSCI 350	Neuroscience Lab Placement I	3 cr.
		or
NSCI 3XX/4XX	Neuroscience Elective	3 cr.
		<b>Subtotal: 16</b>

##### Junior Year - Spring Semester

WIC 3xx-4xx	Writing Intensive Course	3 cr.
NSCI 385	Neurodevelopment	3 cr.
GEN XXX	General Elective	3 cr.
CHEM 210	Organic Chemistry II	3 cr.
CHEM 220	Organic Chemistry Laboratory II	1 cr.
NSCI 351	Neuroscience Lab Placement II	3 cr.
		or
NSCI 3XX/4XX	Neuroscience Elective	3 cr.
		<b>Subtotal: 16</b>

##### Senior Year - Fall Semester

NSCI 405	Seminar in Neuroscience	3 cr.
NSCI 3XX/4XX	Neuroscience Elective	3 cr.
GEN XXX	General Elective	1 cr.
HIST XXX	Historical Perspective	3 cr.
NSCI 450	Senior Neuroscience Thesis I	4 cr.
		or
NSCI 3XX/4XX	Neuroscience Elective	4 cr.
		<b>Subtotal: 14</b>

##### Senior Year - Spring Semester

CUL XXX	Global Cultures Perspective	3 cr.
ART XXX	Aesthetic Perspective	3 cr.
NSCI 3XX/4XX	Neuroscience Elective	3 cr.
NSCI 451	Senior Neuroscience Thesis II	4 cr.
		or
NSCI 3XX/4XX	Neuroscience Elective	4 cr.
		<b>Subtotal: 13</b>

Subtotal: 120

Total Credit Hours: 120

Political Science

**Political Science Major**

(Formerly Government)

**General Information**

The general objective of the Political Science major is to equip students with the analytical tools necessary to understand political processes at work within their own and other societies as well as among states in the global community. The major program offers a wide variety of courses in the areas of American government, comparative politics, international relations, and political thought. Political Science majors benefit from an active internship program that places eligible students in business and industry as well as local, state, and federal government.

**Career Opportunities**

Graduates of the program attend law school as well as graduate programs in political science, public administration, and business. Others enter government service or pursue careers in diverse areas ranging from education to business.

**History and Political Science Faculty****Program Objectives**

1. To assist students in acquiring a more sophisticated understanding of politics in the United States.
2. To develop an appreciation for political processes at work within other societies.
3. To equip students with the analytical tools necessary to understand political processes at work among states in the global community.
4. To accommodate individual interests by providing a wide variety of courses in the areas of American government, comparative government, international relations, and political thought.
5. To provide opportunities for students to pursue internships in local, state, and federal government.

**General University and College Requirements**

See General University Requirements (p. 33) and College of Arts and Sciences Requirements (p. 41).

**Degree Requirements**

Required Political Science courses (27 credit hours)

POSC 101/INST 101	Introduction to Contemporary Global Issues	3 cr.
POSC 102	American National Government	3 cr.
POSC 201	Comparative Politics	3 cr.
POSC 203	International Relations	3 cr.
POSC 207/LSOC 207/PH 207	Introduction to Political Theory	3 cr.
POSC 212	Political Analysis	3 cr.
POSC 490	Seminar in Political Science	4 cr.
POSC 205	Public Administration	3 cr.
	or	

POSC 210	State and Local Politics	3 cr.
	or	
POSC 218	Public Policy in America	3 cr.
	or	
POSC 225/LSOC 225	Law and Judicial Politics	3 cr.
GEOG 110	Geography of United States and Canada	3 cr.

**Subtotal: 27**

Twenty-one additional credit hours of political science including 15 additional credit hours of upper-level courses (POSC 300-400).

The 15 upper-level credit hours must include three credit hours each of comparative government, international relations, and American government.

**Subtotal: 21**

Eighteen credit hours in social sciences including EC 111 and EC 112, and at least three credit hours in geography, history, and psychology.

Also students must take MATH 120.

**Subtotal: 18**

Subtotal: 66

Total Credit Hours: 66

The 2.0 required grade point average in the major is based upon all POSC courses pursued as a part of the student's degree program.

**Political Science Suggested Sequence of Courses**

The schedule of courses below is a sample sequence for a Political Science major. Many students become Political Science majors in their sophomore year and fulfill the major requirements without academic sacrifice.

**Degree Requirements**

Freshman Year- Fall Semester

HIST XXX	History Perspective	3 cr.
POSC 102	American National Government	3 cr.
MATH 1XX	Mathematical Analysis	3 cr.
ENGL 132	English Composition I	3 cr.
LA 110	First Year Seminar Arts & Sciences	3 cr.

**Subtotal: 15**

Freshman Year - Spring Semester

POSC 101/INST 101	Introduction to Contemporary Global Issues	3 cr.
PSY 101	Introduction to Psychology	3 cr.
MATH 120	Intro Statistics for the Arts & Sciences	3 cr.
GEN XXX	General Elective	3 cr.
ENGL 133	English Composition II	3 cr.

**Subtotal: 15**

Sophomore Year - Fall Semester		
POSC 201	Comparative Politics	3 cr.
POSC 207/LSOC 207/PH 207	Introduction to Political Theory	3 cr.
EC 111	Principles of Microeconomics	3 cr.
LAB XXX	Laboratory Science Requirement	3-4 cr.
GEN XXX	General Elective	3 cr.
<b>Subtotal: 15-16</b>		

Sophomore Year - Spring Semester		
POSC 203	International Relations	3 cr.
POSC 212	Political Analysis	3 cr.
POSC 2XX	Political Science Elective	3 cr.
EC 112	Principles of Macroeconomics	3 cr.
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.
<b>Subtotal: 15</b>		

Junior Year - Fall Semester		
PH XXX	Ethical Perspective	3 cr.
CS 13X	Computer Competence	3 cr.
POSC 2XX/3XX	Political Science Elective	3 cr.
ART XXX	Aesthetic Perspective	3 cr.
GEOG 110	Geography of United States and Canada	3 cr.
<b>Subtotal: 15</b>		

Junior Year - Spring Semester		
POSC 3XX	Upper Level Political Science Elective	3 cr.
POSC 3XX	Upper Level Political Science Elective	3 cr.
GEN XXX	General Elective	3 cr.
SBP XXX	Social/Behavioral Sciences Perspective	3 cr.
CUL XXX	Global Cultures Perspective	3 cr.
<b>Subtotal: 15</b>		

Senior Year - Fall Semester		
POSC 3XX	Upper Level Political Science Elective	3 cr.
POSC 3XX	Upper Level Political Science Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
<b>Subtotal: 15</b>		

Senior Year - Spring Semester		
POSC 490	Seminar in Political Science	4 cr.

GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 16</b>

Subtotal: 121-122

Total Credit Hours: 121-122

Two courses must be designated as writing intensive courses.

Psychology

**Psychology Major**

**General Information**

Psychology is the scientific study of thoughts, feelings, and behavior. In addition to helping students understand themselves and others, the research findings of psychology have wide application to many professional fields, from human services to medical, industrial, and educational settings. Within the major there is flexibility to select courses that meet individual career objectives including Sports Psychology, School Psychology, Forensic Psychology, Health Psychology, Organizational Psychology, Clinical Psychology, Neuropsychology, Applied Behavior Analysis, Special Education, Autism Treatment, Cognitive Psychology, Developmental Psychology, Social Psychology, Gender Studies, Conservation Psychology, and Community Psychology, among others.

The Department of Psychology offers students the opportunity to receive either the BA or the BS Degree. The BS degree includes all of the requirements of the BA degree, along with a combination of 18 credits of courses in psychology research, neuroscience, and other sciences. The 18 credits must include at least one psychology research course of at least 3 credits. The remaining credits may be any combination of psychology research, neuroscience, or other science courses (not including those meeting the General University Requirements).

It is recommended that students interested in graduate school should take one or more of our advanced research courses.

Students may also pursue teacher certification at the elementary level by concurrently majoring in Elementary Education, or training in special education, which is available through Education. Applied Behavior Analysis is available through participation in the New England Center for Children internship program.

**Career Opportunities**

Students are prepared to enter the world of work in counseling, research, autism treatment, personnel administration, human service agencies, special education, elementary school teaching or other child life work; to continue their studies at the graduate level; or to enter related fields such as medicine, law, criminal justice, and social work.

**Psychology Faculty**

**Program Goals in Learning Objectives**

Our psychology program is based on five comprehensive learning goals. Each goal encapsulates a series of learning objectives composed of skills and knowledge that our graduates have acquired. Our students develop an understanding of thoughts and behavior and learn to adapt to changing circumstances through understanding others, open communication and critical thought.



**GOAL 1: Knowledge base in Psychology**

- 1.1 Describe key concepts, principles, and overarching themes in psychology
- 1.2 Develop a working knowledge of psychology's content domains
- 1.3 Describe applications of psychology

**GOAL 2: Scientific Inquiry and Critical Thinking**

- 2.1 Apply the scientific method
- 2.2 Critically consume and evaluate psychological research

**GOAL 3: Ethical and Social Responsibility in a Diverse World**

- 3.1 Apply ethical standards to evaluate psychological science and practice
- 3.2 Build and enhance personal relationships
- 3.3 Adopt values that build community at local, national, and global levels

**GOAL 4: Effective Communication**

- 4.1 Demonstrate effective writing for different purposes
- 4.2 Exhibit effective presentation skills for different purposes
- 4.3 Interact effectively with others

**GOAL 5: Personal and Professional Development**

- 5.1 Personal Development
- 5.2 Professional Development

**Student Assessment**

Students' progress in Psychology is assessed in a variety of ways and may include: objective and essay quizzes and examinations, class attendance and participation, journals, individual and group projects, oral presentations, poster sessions, research papers, critical review papers, video recording, and simulations.

Students are encouraged to keep a portfolio of their work as a means of tracking their own development, as well as to demonstrate their abilities and accomplishments when applying to graduate school and/or for positions in the field of psychology.

The Department of Psychology has a multiyear assessment plan to monitor progress in accomplishing articulated goals and to promote ongoing improvement and innovation.

**General University and College Requirements**

See General University Requirements (p. 33) and College of Arts and Sciences Requirements (p. 41).

**Degree Requirements**

Required courses (24 credit hours):

PSY 101	Introduction to Psychology	3 cr.
PSY 201	Developmental Psychology	3 cr.
PSY 207	Statistics for the Behavioral Sciences	3 cr.
PSY 214	Social Psychology	3 cr.
PSY 309	Research Methods	3 cr.
NSCI 212	Introduction to Behavioral Neuroscience	3 cr.
PSY 313	Learning	3 cr.
PSY 326	Abnormal Psychology	3 cr.

**Subtotal: 24**

Three additional credit hours required in psychology elective at the 200-level or above (PSY 200) courses.

**Subtotal: 3**

Nine additional credit hours required in upper-level psychology (PSY 300-400) courses.

**Subtotal: 9**

Note that for the BS degree these credit hours may include research courses in psychology.

Three additional credit hours in a multicultural perspectives course or an approved equivalent.

**Subtotal: 3**

The Psychology department maintains an active list of courses that fulfill this requirement. Additional courses may be approved by department chairperson.

Subtotal: 39

**Total Credit Hours: 39**

The 2.0 required grade point average in the major is based on all PSY courses pursued as a part of the student's degree program.

**Psychology Suggested Sequence of Courses****Degree Requirements****Freshman Year - Fall Semester**

PSY 101	Introduction to Psychology	3 cr.
ENGL 132	English Composition I	3 cr.
LA 110	First Year Seminar Arts & Sciences	3 cr.
GUR xxx	General University Requirement	3 cr.
MATH XXX	Mathematical Analysis	3 cr.

**Subtotal: 15**

**Freshman Year - Spring Semester**

PSY 201	Developmental Psychology	3 cr.
ENGL 133	English Composition II	3 cr.
GEN XXX	General Elective	3 cr.
PSY 214	Social Psychology	3 cr.
MATH XXX	Mathematical Analysis	3 cr.

**Subtotal: 15**

First Year: Students interested in Study Abroad should discuss with their advisor to evaluate the best options so they can meet all requirements for the degree.

Note: MATH 120 is recommended but not required.

Note: Order of the General University requirement courses can be altered (HIST, NSP, CUL, ARTS, PH)

Note: The Computer Competence GUR is met through taking PSY 207; Social Behavioral Sciences GUR is met through any PSY course.

**Sophomore Year - Fall Semester**

PSY 207	Statistics for the Behavioral Sciences	3 cr.
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PSY 313	Learning	3 cr.
GUR xxx	General University Requirement	3 cr.
PSY 2XX/3XX	Psychology Required Elective	3 cr.
NSP	Natural Science Perspective	3 cr.

**Subtotal: 15**

Sophomore Year - Spring Semester

PSY 309	Research Methods	3 cr.
NSCI 212	Introduction to Behavioral Neuroscience	3 cr.
WIC 2XX	Writing Intensive Course	3 cr.
GEN XXX	General Elective	3 cr.
NSP	Natural Science Perspective	3 cr.

**Subtotal: 15**

Junior Year - Fall Semester

PSY 3XX/4XX	Psychology Required Elective	3 cr.
PSY 326	Abnormal Psychology	3 cr.
GUR xxx	General University Requirement	3 cr.
SBMP XXX	Multicultural Perspectives	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Junior Year: Students should consider enrolling in PSY 35x Advanced Research and/or PSY 480 Internship in Psychology during this year and their senior year. Please see the staff in the Career Development Center for a listing of Internship sites.

Junior Year - Spring Semester

PSY 3XX/4XX	Psychology Required Elective	3 cr.
GEN XXX	General Elective	3 cr.
WIC 3xx-4xx	Writing Intensive Course	3 cr.
GUR xxx	General University Requirement	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Senior Year - Fall Semester

PSY 3XX/4XX	Psychology Required Elective	3 cr.
GEN 3XX/4XX	Upper Level General Elective	3 cr.
GEN 3XX/4XX	Upper Level General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Senior Year - Spring Semester

GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.

GEN XXX	General Elective	3 cr.
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**Subtotal: 15**

Senior Year: Students intending to become certified as teachers in elementary education, or intending to enroll in the New England Center for Children program, may need to take all of their major requirements by the end of their junior year so that one semester of their senior year would be free to take the Student Teaching Practicum, or participate in the NECC program. Student Teaching Practicum students should refer to the elementary education program requirements that list the necessary prerequisites for Teacher Certification, including the specific requirements necessary for teacher certification in Massachusetts.

Subtotal: 120

Total Credit Hours: 120

## College of Business

Dean Sharienne Walker  
Associate Dean Paul Costanzo  
Assistant Dean for Undergraduate Studies Kara Kapinos

### College of Business Mission and Vision Statement

#### Mission

We develop educational communities that support lifelong learners who proactively influence their career, organization, and society.

#### Vision

A premier College of Business that challenges and prepares professionals for the dynamic business environment.

#### Degree Learning Goals

The undergraduate curriculum for students in the College of Business includes the following learning goals.

In addition to critical thinking, oral presentation, ethical perspectives, and writing skills reflected in the learning objectives of the General University Requirements, Business students

1. Demonstrate integration of business knowledge and skills with professional career aspirations
2. Apply problem solving techniques to organizational challenges in a dynamic business environment
3. Collaborate with others to achieve common organizational goals
4. Demonstrate understanding of socially responsible business practices

#### Career Preparation

To guide students in selecting an appropriate career path, faculty in each department in the College of Business designed a variety of classroom and outside of the classroom activities to guide the students through the process of a) Career Exploration in the freshman year, b) Career Investigation in the sophomore year, c) Career Determination in the junior year and finally d) Career Implementation in the senior year. In these progressive exercises students link their interests and skills with career paths culminating with activities designed to help the student to enter the field of choice.

#### Special Academic Opportunities (p. 107)

#### Requirements

Students earning a Bachelor of Science in Business Administration must select a major by the end of their sophomore year. Complete requirements for each of the majors in the College of Business are specified under a separate section of this catalogue devoted to major programs. They are accounting, business analytics and information management, entrepreneurship, finance, general business, human resource management, management and leadership, marketing, marketing communications/advertising, pharmaceutical and healthcare business, and sport management. Each undergraduate major in the College of Business includes a general education

component that normally comprises at least 50 percent of the student's four-year program. Requirements common to all majors are:

1. Complete at least 30 credit hours of course work at the 300-400 level.
2. Complete at least 12 credit hours of course work at the 300-400 level in the major at Western New England University. The identification of these upper-level courses are listed under each major.
3. Apply no more than 12 credit hours of ROTC courses towards the graduation requirements.
4. Meet all of the requirements specified under Academics, Undergraduate Policies, Procedures, Requirements, and General University Requirements in this catalogue.

#### College of Business Department Chairs and Faculty

##### *Accounting and Finance Faculty*

#### Department of Accounting and Finance

Professor: Yong Wang, Chair

Professor: May Lo

Associate Professors: Ausher M.B. Kofsky, Bryan Schmutz

Assistant Professors: Paul Tomolonis, Wenru Wang

Professional Educators: Wayne Durr, Tara Grealis, Stephen Sugermeyer

##### *Business Information Systems Faculty*

#### Department of Business Information Systems

Professor: Anil Gulati, Chair

Professors: Bahadir Akcam, Tuncay Bayrak

Associate Professor: Charles Mutigwe

Professional Educator: David DiSabito

##### *Management Faculty*

#### Department of Management

Associate Professor: Joseph Gerard, Chair

Professors: Jeanie Forray, Melissa Knott

Assistant Professor: Natalie Cotton-Nessler

Visiting Professor: Thomas Woodside

Professional Educator: John P. Greeley

##### *Marketing Faculty*

#### Department of Marketing

Professor: Elizabeth Elam, Chair

Professors: Janelle Goodnight, Harlan Spotts

Associate Professor: Mary Schoonmaker

Visiting Professor: Thomas Woodside

##### *Sport Management and Business Law Faculty*

#### Department of Sport Management and Business Law

Associate Professor: James Masteralexis, Chair

Professors: Paul Costanzo, Daniel Covell, Harvey Shrage, Sharianne Walker

Assistant Professor: Se Jin Kim

College of Business Special Academic Opportunities

**Special Academic Opportunities**

**Delbridge Business Honors Program**

The College of Business provides academically qualified and motivated students with the opportunity to distinguish their academic career through participation in the Delbridge Business Honors Program. Business Honors courses are distinguished by the type of work required, pace of study, and opportunities for broader consideration of core course themes. In addition, Business Honors courses emphasize critical and independent thinking to produce creative applications of ideas.

*Admission*

Entering College of Business freshmen with a minimum high school GPA of 3.8 are automatically eligible for the Delbridge Business Honors Program. In addition, other freshmen who present remarkable GPAs or SAT/ACT scores may be invited to join the Business Honors Program. Admission decisions will be made by the Honors Committee so that students may be registered for the first honors course during Summer Orientation and Registration Program (SOAR).

*Requirements*

To receive the College of Business Honors designation on their transcript, a student must:

1. Complete 18 credits of honors courses: 12 of these 18 credits must be taken from honors courses in the College of Business; 6 of these 12 Business honors credits must be at the 300- or 400-level.
2. Complete an honors project (HONB 495) as approved and overseen by the Honors Committee in the College of Business.

**ERP Certificate with SAP (p. 170)**

Students can earn an ERP certificate with SAP by taking three SAP core Business courses. This can be done within the normal College of Business requirements.

**College of Business Bachelor of Science in Business Administration (BSBA) and General University Core Requirements (78 credits)**

The following courses are required of all BSBA majors and include University-wide requirements. All are three credit courses unless otherwise noted.

**Degree Requirements - BSBA Core Courses (39 credits)**

**First Year Requirements**

BUS 110	Introduction to Business Seminar	3 cr.
BIS 102	Problem Solving with Business Tools	3 cr.
AC 101/HONB	Financial Reporting I	3 cr.

203

**Subtotal: 9**

**Sophomore Year Requirements**

MAN 204/HONB 204	Management and Organizational Behavior	3 cr.
MK 200/HONB 200	Principles of Marketing	3 cr.
BIS 202	Introduction to Business Information Systems	3 cr.
AC 202	Managerial Accounting	3 cr.
BIS 221	Statistics for Business Analytics	3 cr.
FIN 214	Introduction to Finance	3 cr.
BL 201/HONB 201	Introduction to Business Law	3 cr.

**Subtotal: 21**

\*\*BL 201: For Sport Management majors, BL 360 replaces this requirement.

**Junior Year Requirements**

BIS 310	Quality and Operations Management	3 cr.
	or	
BIS 312	Quality and Operations Management with SAP	3 cr.
BUS 326	Business Planning for New Ventures	3 cr.
	or	
BUS 312/HONB 312	Business Processes and Enterprise Resource Planning with SAP	3 cr.

**Subtotal: 6**

**Senior Year Requirements**

BUS 423/BME 423/ME 423	Product Development and Innovation	3 cr.
	or	
BUS 450/HONB 450	Business Strategy	3 cr.

**Subtotal: 3**

Subtotal: 39

**General University Requirement Courses (39 credits)**

**First Year Requirements**

ENGL 132	English Composition I	3 cr.
ENGL 133	English Composition II	3 cr.
MATH 111	Analysis for Business and Economics	3 cr.
	or	

MATH 123	Calculus I for Management, Life, and Social Sciences	3 cr.
	And	
QR 112	Quantitative Reasoning for Business	3 cr.
EC 111	Principles of Microeconomics	3 cr.
EC 112	Principles of Macroeconomics	3 cr.
PSY 101	Introduction to Psychology	3 cr.
	or	
SO 101	Introduction to Sociology	3 cr.
HIST XXX	Historical Perspective	3 cr.

**Subtotal: 24**

\*BIS 102, EC 111 and EC 112 meet both a General University Requirement and a Business Core Requirement.

MATH 100 Algebra Fundamentals is available for students who have a math deficiency. This course is accepted as a general elective credit counted toward graduation.

#### Sophomore-Senior Year Requirements

MAN 240/HONB 240	Business and Society	3 cr.
	or	
PH 211	Business Ethics	3 cr.
CUL XXX	Global Cultures Perspective	3 cr.
COMM 233	Business Writing and Communication	3 cr.
SCI xxx	Two Lab Science, or One Lab Science and One Natural Science	6 cr.

**Subtotal: 15**

MAN 240/HONB 240/PH 211 and COMM 233 meet both a General University Requirement and a Business Core Requirement.

Natural Science Perspective: Two Physical or Biological Science lab choices of: Biology, Chemistry, Geology, Meteorology, or Physics, or one lab choice and one Natural Science Perspective without a lab component (6 cr.)

If CUL XXX does not include the aesthetic perspective (CA), a general elective must be selected to satisfy that requirement.

Subtotal: 39

Total Credit Hours: 78

#### Five-year Bachelor/MBA Program

This program allows full-time undergraduate students in the College of Business to accelerate the completion of the bachelor's and master's degrees in business. Students can earn the popular and valuable Master of Business Administration degree with just one

additional year of study. A detailed program of study can be found at Five-year Bachelor/MBA Program (p. 334).

#### Program Prerequisites:

Satisfied by completing the undergraduate business core (BIS 221, EC 111, AC 101/HONB 203, and FIN 214) courses with a "B" average or better with no grade below a C.

#### Program Application and Admission Requirements:

This program seeks students who have excelled in their undergraduate studies. Applicants must:

1. Earn an overall GPA of 3.0.
2. Complete the College of Business Graduate Studies application, and essays for the MBA program. All application materials should be submitted to the Admissions Office.
3. Forward scores for the Graduate Management Admission Test (GMAT) to the Admissions Office. Students should seek to score 500 or higher on the GMAT. Students may also apply for a GMAT waiver based on a cumulative GPA of 3.3 or higher at the time of graduation.

Applicants may take up to two graduate courses in their senior year prior to admission. A third graduate course may be taken during the senior year after a student has been admitted.

#### Five-year Bachelor/Master of Science in Accounting Program

This program allows undergraduate full-time Accounting majors in the College of Business to complete both the bachelor's and master's degrees in Accounting. Students can earn the Master of Science in Accounting degree within five years of entry as an undergraduate. A detailed program of study can be found at Five-year Bachelor/Master of Science in Accounting Program (p. 336).

#### Program Prerequisites:

Satisfied after completing the following undergraduate courses: AC 101/HONB 203, AC 202, AC 305, AC 306, AC 313, AC 330, AC 419, and AC 440 with a "B" average or better and no grade below a "C". Program Application and Admission Requirements:

1. Earn an overall GPA of 3.0.
2. Complete the College of Business Graduate Studies application and essays for the Master of Science in Accounting program. All application materials should be submitted to the Admissions Office.
3. Forward scores for the Graduate Management Admission Test (GMAT) to the Admissions Office. Students should seek to score 500 or higher on the GMAT. Students may also apply for a GMAT waiver based on a cumulative GPA of 3.3 or higher at the time of graduation.

Applicants may take up to two graduate courses in their senior year.

#### Five-year Bachelor/MBA and Five-year Bachelor/Master of Science in Accounting Programs – Early Acceptance

Students who have achieved a high level of success in their high school academic performance may apply for conditional early acceptance into either program as freshmen. To qualify for this opportunity, applicants typically have earned a high school GPA of 3.5 or higher, and a combined verbal and quantitative sections score of 1200 or higher on the SAT. Once admitted, students must

1. Maintain an overall GPA of 3.3 or higher, after freshman year.
2. Successfully complete an undergraduate degree.
3. Earn a “B” average or better with no grade below a “C” in the prerequisite courses.

A detailed program of study can be found at Five-year-Bachelor MBA Program-Early Acceptance (p. 335), or Five-year Bachelor/Master of Science in Accounting Program-Early Acceptance (p. 336).

Four-year Bachelor/Master Science in Accounting

### Four-year Bachelor/Master Science in Accounting

#### General Information

This program allows undergraduate full-time Accounting majors in the College of Business to accelerate the completion of both the bachelor’s and master’s degrees in Accounting. Students accepted into this program can earn the Master of Science in Accounting degree in as few as four years.

This program is a combination of the undergraduate Accounting major and the Master of Science in Accounting. With the permission of the department chair, students will be able to take any graduate course once they have completed the undergraduate prerequisite with a “B” or better. Students taking the CPA exam must check the requirements of the respective jurisdiction.

This program requires up to 18 credit hours a semester, summer study, and some graduate study prior to an undergraduate degree. Some instruction will be online. Students seeking admission to the program at the time of their admission to the University must take either the SAT or the ACT entrance exam and complete the Accelerated Accounting Program application. Students seeking admission to the program at a later time must have earned a “B+” average or better in AC 101/HONB 201, AC 202, and AC 305 and a minimum 3.0 cumulative BSBA GPA. Students who wish to have a less-intensive undergraduate experience can move to the “4+1” program. To complete the accelerated program students must earn an average GPA of 3.0 or higher in AC 620, AC 621, AC 622, AC 646, FIN 612, FIN 630, and three electives.

**Accounting and Finance Faculty** (p. 106)

#### Program Learning Goals

Note: Because this will appear in the catalogue in the format of the Five-year Bachelor/Master of Science in Accounting Program, the program objectives and the career development will not be displayed. The Program objectives are a combination of the BSBA in Accounting and the MSA objectives.

1. Understand the accounting conceptual framework as it relates to the measurement and reporting of financial information.
2. Understand the use of accounting information in the planning, controlling, and decision-making processes in organizations.
3. Understand internal control objectives and auditing standards and practices.
4. Understand the basic concepts of federal taxation.

5. Understand issues associated with the design and implementation of accounting information systems.
6. Analyze business decisions using the core accounting skills of reporting, audit, tax, and technology.
7. Create financial information through business reporting and analysis.
8. Evaluate financial choices with tax compliance and planning skills.
9. Understand the risks and rewards to business through information systems and controls.
10. Demonstrate proficiency in using ethical reasoning skills.

See Core Requirements for all Business Majors (p. 107) and General University Requirements (p. 33)

### Accounting Suggested Sequence of Courses (4 year BS /MS)

#### Degree Requirements

##### Freshman Year - Fall Semester

BUS 110	Introduction to Business Seminar	3 cr.
MATH 111	Analysis for Business and Economics	3 cr.
ENGL 132	English Composition I	3 cr.
BIS 102	Problem Solving with Business Tools	3 cr.
EC 111	Principles of Microeconomics	3 cr.
PSY 101	Introduction to Psychology	3 cr.
	or	
SO 101	Introduction to Sociology	3 cr.
		<b>Subtotal: 18</b>

##### Freshman Year - Spring Semester

AC 101/HONB 203	Financial Reporting I	3 cr.
QR 112	Quantitative Reasoning for Business	3 cr.
ENGL 133	English Composition II	3 cr.
EC 112	Principles of Macroeconomics	3 cr.
BIS 202	Introduction to Business Information Systems	3 cr.
MAN 204/HONB 204	Management and Organizational Behavior	3 cr.
		<b>Subtotal: 18</b>

##### Sophomore Year - Summer

GEN XXX	General Elective	3 cr.
LAB XXX	Laboratory Science	3 cr.
		<b>Subtotal: 6</b>

##### Sophomore Year - Fall Semester

AC 202	Managerial Accounting	3 cr.
AC 305	Financial Reporting II	3 cr.
BIS 221	Statistics for Business Analytics	3 cr.
FIN 214	Introduction to Finance	3 cr.
BL 201/HONB 201	Introduction to Business Law	3 cr.
MK 200/HONB 200	Principles of Marketing	3 cr.
		<b>Subtotal: 18</b>

## Sophomore Year - Spring Semester

AC 306	Financial Reporting III	3 cr.
BIS 312	Quality and Operations Management with SAP	3 cr.
BUS 312/HONB 312	Business Processes and Enterprise Resource Planning with SAP	3 cr.
AC 313	Taxation of Individuals	3 cr.
COMM 233	Business Writing and Communication	3 cr.
HIST XXX	Historical Perspective	3 cr.
		<b>Subtotal: 18</b>

## Junior Year - Summer

GEN XXX	General Elective	3 cr.
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.
		<b>Subtotal: 6</b>

## Junior Year - Fall Semester

AC 440	Accounting Analytics	3 cr.
AC 414	Taxation of Entities	3 cr.
AC 419	Auditing and Assurance Services	3 cr.
BUS 450/HONB 450	Business Strategy	3 cr.
or		
BUS 423/BME 423/ME 423	Product Development and Innovation	3 cr.
MAN 240/HONB 240	Business and Society	3 cr.
or		
PH 211	Business Ethics	3 cr.
CUL XXX	Global Cultures Perspective	3 cr.
		<b>Subtotal: 18</b>

## Junior Year - Spring Semester

AC 311	Municipal & Fund Accounting	3 cr.
AC 480	Internship in Accounting	3 cr.
or		
GEN XXX	General Elective	6 cr.

AC 330	Accounting Information Systems	3 cr.
GEN XXX	General Elective	6 cr.
		<b>Subtotal: 12</b>

## Senior Year - Summer

AC 620	Advanced Topics in Auditing and Assurance Services	3 cr.
AC 622	Accounting Theory & Contemp Issues	3 cr.
FIN 612	Business Analysis and Valuation	3 cr.
		<b>Subtotal: 9</b>

## Fourth Year - Fall

AC 621	Advanced Financial Accounting	3 cr.
AC 646	Selected Topics in Taxation	3 cr.
FIN 630	Managerial Finance	3 cr.
		<b>Subtotal: 9</b>

## Fourth Year - Spring

AC 610	Cost-Based Decision-Making	3 cr.
AC 641	Fraud Examination	3 cr.
AC 642	Forensic Accounting	3 cr.
BL 640	Business Law	3 cr.
		<b>Subtotal: 12</b>

Subtotal: 144

Total Credit Hours: 144

Students must take 30 credit hours of course work in 300-400 level courses. All students must take 12 hours of upper level (300-400) courses in their major at Western New England University.

General electives must be selected in such a way to ensure that all "perspectives of understanding" requirements have been satisfied.

Courses to be included in computing the 2.0 minimum average in the major are as follows: all upper level AC.

Accounting

## Accounting Major

## General Information

The course of study for Accounting majors is designed to provide the professional education needed for careers in private industry, government, public accounting, or not-for-profit organizations. The combination of training in accounting, business subjects, and the arts and sciences prepares the student for potential advancement to positions of managerial responsibility.

Students desiring to prepare for the CPA examination are advised to consult the Accountancy Board of the state of their choice to ensure that they will be able to meet the educational requirements of that jurisdiction. Students have the opportunity to continue in a Master of Science in Accounting program designed to meet the 150-hour academic requirement that has been adopted by most states. Accounting majors who desire preparation to meet the requirements of a particular state may, if necessary, modify their program of study in conference with, and approval of, their department chair.

## Career Preparation

In order to help students understand careers available to Accounting majors, faculty in the Accounting department designed activities to guide students from career exploration through career implementation. Examples of some of these include:

1. Career Exploration in the freshman year is accomplished in "Professional Development in Accounting," a seminar where alumni, practitioners, and recruiters introduce students to career opportunities, CPA licensing, and other credentialing.
2. Career Investigation in the sophomore year courses includes classroom assignments in AC 101/HONB 203 and AC 202 and "Meet the Firms Night", where the students meet recruiters in a casual setting.
3. Career Determination in the junior year engages students in résumé and cover letter writing and mock interviews.
4. Career Implementation in the senior year includes examination of professional certifications.
5. Students complete their preparation through a required internship.

**Career Opportunities**

Accounting majors find positions in national and regional public accounting, corporate and financial accounting, taxation, internal audit, and governmental and nonprofit accounting. The major provides an excellent foundation for legal careers and advanced business degrees.

**Accounting and Finance Faculty** (p. 106)

**Program Learning Goals**

Having completed a major in Accounting, the student will have the ability to:

1. Understand the accounting conceptual framework as it relates to the measurement and reporting of financial information.
2. Understand the use of accounting information in the planning, controlling, and decision-making processes in organizations.
3. Understand internal control objectives and auditing standards and practices.
4. Understand the basic concepts of federal taxation.
5. Understand issues associated with the design and implementation of accounting information systems.

See Core Requirements for all Business Majors (p. 107) and General University Requirements (p. 33)

**Degree Requirements**

Required Accounting courses (24 credit hours)

AC 305	Financial Reporting II	3 cr.
AC 306	Financial Reporting III	3 cr.
AC 311	Municipal & Fund Accounting	3 cr.
AC 313	Taxation of Individuals	3 cr.
AC 330	Accounting Information Systems	3 cr.
AC 414	Taxation of Entities	3 cr.
AC 419	Auditing and Assurance Services	3 cr.

AC 440	Accounting Analytics	3 cr.
		<b>Subtotal: 24</b>

Electives (18 credit hours)		
GEN XXX	General Electives	18 cr.
		<b>Subtotal: 18</b>

Subtotal: 42

Total Credit Hours: 42

**Accounting Suggested Sequence of Courses**

**Degree Requirements**

First and Sophomore Year

See Core Requirements for all Business Majors (p. 107)

**Subtotal: 60**

**Junior Year - Fall Semester**

AC 305	Financial Reporting II	3 cr.
AC 313	Taxation of Individuals	3 cr.
LAB XXX	Laboratory Science	3 cr.
BUS 326	Business Planning for New Ventures	3 cr.
or		
BUS 312/HONB 312	Business Processes and Enterprise Resource Planning with SAP	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 15</b>

**Junior Year - Spring Semester**

AC 306	Financial Reporting III	3 cr.
AC 414	Taxation of Entities	3 cr.
CUL XXX	Global Cultures Perspective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 15</b>

**Senior Year - Fall Semester**

AC 311	Municipal & Fund Accounting	3 cr.
AC 330	Accounting Information Systems	3 cr.
AC 419	Auditing and Assurance Services	3 cr.
GEN XXX	General Elective	3 cr.
BIS 310	Quality and Operations Management	3 cr.
or		
BIS 312	Quality and Operations Management with SAP	3 cr.
		<b>Subtotal: 15</b>



## Senior Year - Spring Semester

AC 440	Accounting Analytics	3 cr.
AC 480	Internship in Accounting	3 cr.
	or	
GEN XXX	General Elective	3 cr.
BUS 423/BME 423/ME 423	Product Development and Innovation	3 cr.
	or	
BUS 450/HONB 450	Business Strategy	3 cr.
GEN XXX	General Elective	3 cr.
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.

**Subtotal: 15**

Subtotal: 120

Total Credit Hours: 120

Students must take 30 credit hours of course work in 300-400 level courses. All students must take 12 hours of upper level (300-400) courses in their major at Western New England University.

General electives must be selected in such a way to ensure that all “perspectives of understanding” requirements have been satisfied.

Courses to be included in computing the 2.0 minimum average in the major are as follows: all upper level AC.

Business Analytics and Information Management

**Business Analytics and Information Management****General Information**

The Business Analytics and Information Management (BAIM) major prepares students for careers in Business Analytics and related fields. Business decisions these days are data driven and this program teaches the tools and techniques used by professionals in the field. All business decision makers are consumers of analytics. Business Analytics skills are applicable to all industries such as finance, retail, healthcare, sports, and entertainment, to name a few. All functions in an organization such as accounting, finance, management, marketing, and sales need analytics, hence Business Analytics skills. Business Intelligence (BI), Data Mining (DM), Python, Predictive Analytics (PA), and Data Visualization software are some of the focus areas in the BAIM major.

Our BAIM courses include topics in Business Intelligence, Data Management, and Analytics as recommended by the SAS Academic Programs. SAS is a provider of industry standard Analytics software. Specifically, our courses use SAS Enterprise Miner extensively. Upon successful completion of the BAIM program, students are automatically awarded a SAS certification sanctioned by the SAS Institute academic programs.

In addition, BAIM students can earn SAP certificate by completing three designated courses which provide substantial hands-on instruction using SAP, a widely used ERP software. These designated courses are SAP versions of the required core courses, thus require no additional coursework. The SAP certificate is issued by WNE and is sanctioned by the SAP University Alliance, of which we are a member.

**Career Preparation**

To emphasize the career options best suited for BAIM majors, faculty in the BIS department will provide in-class activities to guide students from career exploration through career implementation. Examples of some of these include:

1. Career exploration in the freshman year is accomplished in the First Year Seminar and BIS 102—Problem Solving with Business Tools course where students are introduced to business analytics career opportunities;
2. Career investigation in the sophomore year courses includes assignments to investigate business analytics jobs in BIS 202—Introduction to Business Information Systems and BIS 221—Statistics for Business Analytics and guest speakers;
3. Career determination in the junior year engages students in a mentor plan and interaction with local technology experts; and
4. Career implementation in the senior year includes internships. Students are exposed to tasks, tools, and technology in professional job settings with internships.

**Career Opportunities**

As an emerging field, there is a high demand for business professionals with Business Analytics skills. While Department of Labor forecasts a “bright outlook” for the jobs in business analytics, McKinsey Global Institute estimates “a shortage of 140,000 to 190,000 people with deep analytical skills as well as 1.5 million managers and analysts to analyze big data and make decisions” in the United States alone. Data Visualization skills are nearly a job requirement for all Business School graduates.

Banking, retail, insurance, manufacturing, healthcare, and telecommunications are sample list of industries utilizing Business Analytics solutions to streamline operations. Understanding, planning, managing, and predicting financial and operational performance are common processes in many industries. Almost all businesses today employ professionals with Business Analytics skills.

**Business Analytics and Information Systems Faculty (p. 106)****Program Learning Goals**

The Business Analytics and Information Management major has four goals. Graduates from BAIM will be able to do the following tasks to support decision making and problem solving in businesses:

1. Identify, collect, and analyze data. Make business decisions based on Data Analysis (DA).
2. Develop, deploy, and improve decision-making and problem solving processes with models.
3. Utilize relevant techniques to address Business Analytics needs of organizations.
4. Use tools and technology to support decision-making and problem solving.

Practicum

BAIM majors are strongly advised to take advantage of Internship opportunities available to them. The practical experience gained via internships supplements the classroom learning and leads to expanded full time employment opportunities, after graduation. To this end, BIS 480 is the designated course.

See Core Requirements for All Business Majors (p. 107) and General University Requirements (p. 33) (78 credit hours)

**Degree Requirements**

Required Business Analytics courses (21 credit hours)

BIS 230	Business Analytics Theory & Practice	3 cr.
BIS 321/IT 300	Database Management Systems	3 cr.
BIS 330	Applied Data Mining	3 cr.
BIS 412	Business Analytics with SAP	3 cr.
BIS 445	Business Analytics Project	3 cr.
BIS 450	Multivariate & Big Data Analysis	3 cr.
BIS 3XX/4XX	Elective	3 cr.
		<b>Subtotal: 21</b>

Electives (21 credit hours)

BIS 480	Internship in Business Information Systems	3 cr.
	or	
GEN 3XX	Upperlevel General Elective	3 cr.
	And	
GEN 3XX	Upperlevel General Elective	3 cr.
GEN XXX	General Electives	15 cr.
		<b>Subtotal: 21</b>

Subtotal: 42

Total Credit Hours: 42

**Business Analytics and Information Management Suggested Sequence of Courses**

**Degree Requirements**

First and Sophomore Year

See Core Requirements for all Business Majors (p. 107)

**Subtotal: 60**

Junior Year - Fall Semester

BIS 230	Business Analytics Theory &	3 cr.
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	Practice	
BUS 312/HONB 312	Business Processes and Enterprise Resource Planning with SAP	3 cr.
BIS 321/IT 300	Database Management Systems	3 cr.
LAB XXX	Laboratory Science	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 15</b>

Junior Year - Spring Semester

BIS 330	Applied Data Mining	3 cr.
BIS 312	Quality and Operations Management with SAP	3 cr.
CUL XXX	Global Cultures Perspective	3 cr.
BIS 3XX/4XX	Elective	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 15</b>

Senior Year - Fall Semester

BIS 412	Business Analytics with SAP	3 cr.
BIS 445	Business Analytics Project	3 cr.
GEN XXX	General Elective	3 cr.
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 15</b>

Senior Year - Spring Semester

BUS 450/HONB 450	Business Strategy	3 cr.
BIS 450	Multivariate & Big Data Analysis	3 cr.
BIS 480	Internship in Business Information Systems	3 cr.
	or	
GEN 3XX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN 3XX	General Elective	3 cr.
		<b>Subtotal: 15</b>

Subtotal: 120

Total Credit Hours: 120

Students must take 30 credit hours of coursework in 300-400 level courses. All students must take 12 hours of upper level (300-400) courses in their major at Western New England University.

General electives must be selected in such a way to ensure that all "perspectives of understanding" requirements have been satisfied.

Courses to be included in computing the 2.0 minimum average in the major are as follows: BIS 230, BIS 321, BIS 330, BIS 412, BIS 445, BIS 450, and BIS upper level elective

## Finance

## Finance Major

## General Information

Courses in Finance provide the professional education for a wide spectrum of careers in finance. Accounting, economics, quantitative analysis, and studies of the financial environment are integrated to form both the skills required for traditional financial functions and the ability to stay abreast of a rapidly evolving technological environment.

By judicious selection of elective courses, the student, with the assistance of an academic advisor, can chart a course of specialization in the areas of investment management, personal financial management, credit analysis, or corporate financial management.

Internships in finance are required as part of the Finance major.

## Career Preparation

In order to help students understand careers available to Finance majors, faculty in the Department of Finance designed activities to guide students from career exploration through career implementation. Examples of some of these include:

1. Career Exploration in the freshman year is accomplished in First Year Seminar where students are introduced to career opportunities in finance;
2. Career Investigation in the sophomore year courses includes classroom assignments in FIN 214;
3. Career Determination in the junior year engages students in résumé and cover letter writing and mock interviews; and
4. Career Implementation in the senior year includes examination of professional certifications.
5. All finance majors complete their preparation with a substantive practical experience.

## Career Opportunities

Finance majors find positions in brokerage firms, personal financial planning, banking, corporate financial management, international finance, underwriting, portfolio management, and insurance. Students are encouraged to take professional exams after graduation and to earn advanced business degrees.

Faculty (p. 106)

## Program Learning Goals

Having completed a major in Finance, the student will have the ability to:

1. Utilize financial statements to make informed investment decisions;
2. Demonstrate the ability to determine strategies for corporate decision-making based on standard assessments of risks and rewards;
3. Understand the financial system, the regulatory

environment, and ethical standards of financial conduct;

4. Understand how capital is allocated by the financial system;

5. Understand the conceptual framework for managing multiple investments.

See Core Requirements for All Business Majors and General University Requirements (78 credits hours).

## Degree Requirements

## Required Finance courses (24 credit hours)

FIN 312	Financial Markets and Institutions	3 cr.
FIN 317	Investments	3 cr.
FIN 318	Security Analysis	3 cr.
FIN 320	Intermediate Corporate Finance	3 cr.
FIN 350	Advanced Corporate Finance	3 cr.
FIN 405	Financial Statement Analysis	3 cr.
FIN 3XX-AC 3XX	Elective	6 cr.

**Subtotal: 24**

## Electives (18 credit hours)

GEN XXX	General Electives	18 cr.
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**Subtotal: 18**

Subtotal: 42

Total Credit Hours: 42

## Finance Suggested Sequence of Courses

## Degree Requirements

## First and Sophomore Year

See Core Requirements for all Business Majors (p. 107)

**Subtotal: 60**

## Junior Year - Fall Semester

BUS 326	Business Planning for New Ventures	3 cr.
	or	
BUS 312/HONB 312	Business Processes and Enterprise Resource Planning with SAP	3 cr.
FIN 317	Investments	3 cr.
FIN 320	Intermediate Corporate Finance	3 cr.
GEN XXX	General Elective	6 cr.

LAB XXX	Laboratory Science	3 cr.
		<b>Subtotal: 15</b>
Junior Year - Spring Semester		
FIN 318	Security Analysis	3 cr.
FIN 350	Advanced Corporate Finance	3 cr.
FIN 480	Internship in Finance	3 cr.
		or
GEN XXX	General Elective	3 cr.
FIN 312	Financial Markets and Institutions	3 cr.
CUL XXX	Global Cultures Perspective	3 cr.
		<b>Subtotal: 15</b>
Senior Year - Fall Semester		
FIN or AC 3XX-4XX	Elective	3 cr.
FIN 405	Financial Statement Analysis	3 cr.
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.
BIS 310	Quality and Operations Management	3 cr.
		or
BIS 312	Quality and Operations Management with SAP	3 cr.
GEN XXX	General Elective	6 cr.
		<b>Subtotal: 15</b>
Senior Year - Spring Semester		
BUS 423/BME 423/ME 423	Product Development and Innovation	3 cr.
		or
BUS 450/HONB 450	Business Strategy	3 cr.
FIN or AC 3XX-4XX	Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 15</b>

Subtotal: 120

Total Credit Hours: 120

Students must take 30 credit hours of coursework in 300/400 level courses. All students must take 12 hours of upper level (300/400) courses in their major at Western New England University.

General electives must be selected in such a way to ensure that all "perspectives of understanding" requirements have been satisfied.

Courses to be included in computing the 2.0 minimum average in the major are as follows:

All FIN 3XX-4XX, AC 3XX-4XX courses that are applied toward the degree.

General Business

### General Business Major

#### General Information

The General Business (GB) program provides the opportunity to construct a personalized major when professional goals or interests sit outside of current program offerings, when existing transfer or WNE-earned credits create unique opportunities, or when life changes demand it. This program allows students to combine a selection of courses or certificates from two or more disciplines according to their interests and goals.

#### Career Preparation

In order to help students understand careers available to General Business majors, faculty design assignments and class projects to guide students from career exploration through career implementation. Examples of some of these include:

1. Career Exploration in the freshman year occurs in the Introduction to Business Seminar (BUS 110) where students are introduced to business career opportunities; as well as discussions on how certificates in the College of Business can help students build their personal brands;
2. Career Investigation in the sophomore year includes classroom assignments and projects in core business courses such as MK 200/HONB 200, BIS 202/BIS 221, AC 101/HONB 203, FIN 214, and MAN 204; an introduction to certificate options and student enrollment in courses that support certificates further advance career exploration;
3. Career Determination in the junior year is accomplished through varied coursework in College of Business courses as well as BUS 350; an internship search with Career Services, engagement in courses embedded within certificates, and student-selected course clusters help guide career determination.
4. Career Implementation in the senior year is addressed through participation in a required internship and other field experiences in BUS 465 and BUS 480.

Students should select individual courses and certificates that distinguish them from others entering the marketplace and identify their unique career path.

#### Career Opportunities

This program permits students to pursue goals that are not addressed in a regular major program.

#### Faculty (p. 106)

Faculty in this major come from all departments in the College of Business.

#### Program Objectives

1. To allow students to construct a unique major and guide them in planning their own education.
2. To gather courses from at least two major departments in the College of Business.
3. To help students define educational and professional goals.

4. To have students explore elements across disciplines that complement one another and prepare students for their desired careers.

**Program Learning Goals**

Having completed a major in General Business, the student will have the ability to:

1. Understand and apply concepts and theories from at least two business functions.
2. Apply knowledge of various business functions in order to make recommendations for business decisions or actions; and
3. Establish individual learning goals and demonstrate their accomplishment.

See Core Requirements for All Business Majors (p. 107) and General University Requirements (p. 33) (78 credit hours)

**Degree Requirements**

For students interested in minoring in a business discipline, see Description of Minors Programs in catalogue.

For students interested in pursuing a certificate in a business discipline, see Description of Certificate Programs in catalogue.

General Business majors may select their coursework using individual courses or they may combine business certificates. Students must declare certificates officially before the last day of the semester preceding graduation. Certificates are not awarded automatically based on coursework.

General Business majors may count more than one certificate toward major requirements if the certificates are housed in different College of Business Programs. A General Business major may include only one of the certificates offered by Business Information Systems and only one of the certificates offered by Management and Leadership.

For students interested in minoring in a business discipline, see Description of Minors Programs (p. 156) in catalogue.

Total Credit Hours: 42

**General Business Suggested Sequence of Courses**

**Degree Requirements**

First and Sophomore Year

See Core Requirements for all Business Majors (p. 107)

**Subtotal: 60**

**Junior Year - Fall Semester**

BUS 326	Business Planning for New Ventures	3 cr.
	or	
BUS 312/HONB 312	Business Processes and Enterprise Resource Planning with SAP	3 cr.

BUSE 3XX/4XX	Business Upper Level course	3 cr.
BUS 480	Internship in Business	3 cr.
GEN XXX	General Elective	3 cr.
LAB XXX	Laboratory Science	3 cr.

**Subtotal: 15**

**Junior Year - Spring Semester**

BUSE 3XX/4XX	Business Upper Level course	3 cr.
BUSE 3XX/4XX	Business Upper Level course	3 cr.
BUS 350	Business Etiquette and Professionalism	3 cr.
CUL XXX	Global Cultures Perspective	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

**Senior Year - Fall Semester**

BUSE 3XX/4XX	Business Upper Level course	3 cr.
BIS 310	Quality and Operations Management	3 cr.
	or	
BIS 312	Quality and Operations Management with SAP	3 cr.
GEN XXX	General Elective	6 cr.
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.

**Subtotal: 15**

**Senior Year - Spring Semester**

BUS 423/BME 423/ME 423	Product Development and Innovation	3 cr.
	or	
BUS 450/HONB 450	Business Strategy	3 cr.
BUS 465	Senior Seminar in General Business	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	6 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Subtotal: 120

Total Credit Hours: 120

Students must take 30 credit hours of coursework in 300-400 level courses. All students must take 12 hours of upper level (300-400) courses in their major at Western New England University.

General electives must be selected in such a way as to ensure that all “perspectives of understanding” requirements have been satisfied.

Courses to be included in computing the 2.0 minimum average in the major are as follows: BUS 350, BUS 465, BUS 480 and all upper level Business electives except BIS 312/BIS 310, BUS 312/BUS 326, and BUS 423/BUS 450.

\*The General Business major is required to complete an internship in any of the areas represented by the College of Business.

Human Resource Management

**Human Resource Management Major -**

**General Information**

The Human Resource Management program emphasizes the knowledge and competencies necessary to be a Human Resource Management professional in an organization of any size by developing expertise in employment law, workplace diversity, and HR analytics. Students become skilled as strategic business partners capable of solving organizational problems. Students engage in experiential learning opportunities that prepare them to be strategic, innovative problem solvers in organizations across industries.

**Career Preparation**

In order to help students understand the range of careers available to Human Resource Management majors, faculty in the Department of Management provide activities to guide students from career exploration through career implementation. Examples of some of these activities include:

- A. Career Exploration in the freshmen year is accomplished in MAN 204/HONB 204;
- B. Career Investigation in the sophomore year is accomplished in MAN 303, where students receive an in-depth look at HRM career opportunities and review their résumés;
- C. Career Determination in the junior year is accomplished through HRM specific coursework; and
- D. Career Implementation in the senior year is addressed through participation in the “RealTest” Assessment Exercise as part of the HRM 466 capstone course.

**Career Opportunities**

Human Resource Management (HRM) majors are prepared for a career path in human resources across industries. Graduates are uniquely equipped to understand the strategic direction of organizations and use analytics to identify innovative people-oriented solutions to problems and opportunities. Although career paths available to students include HRM generalist and HRM specialist (focused on a specific HRM area), HRM knowledge and skills are desired assets for many managerial positions

**Management Faculty** (p. 106)

**Program Learning Goals**

Having completed a major in Human Resource Management, the student will have the ability to:

- 1. Understand and apply the concepts and theories of Human Resource Management;
- 2. Understand employment law, labor law, and compliance;
- 3. Apply knowledge of workplace diversity to HRM practices in the organization;
- 4. Use data to identify and address organizational problems and opportunities;
- 5. Understand HRM’s role as a strategic business partner; and

6. Demonstrate skill and competency in HRM interpersonal practices.

See Core Requirements for All Business Majors (p. 107) and General University Requirements (p. 33) (78 credit hours)

For students interested in minoring in Human Resources, see Description of Minors Programs in catalogue.

For students interested in pursuing related certificates in Management or other business discipline, see Description of Certificate Programs in catalogue.

**Degree Requirements**

Required Management, Human Resource Management and Business Law courses (30 credit hours)

BL 308	Labor Management Relations	3 cr.
BL 424	Business Law for Human Resource Management	3 cr.
MAN 303	Interpersonal Skills for Leading	3 cr.
HRM 322	Managing a Diverse Workforce	3 cr.
HRM 323	Human Resource Management	3 cr.
HRM 324	Performance Management	3 cr.
HRM 328	Human Resources Analytics	3 cr.
HRM 436	Compensation and Benefits	3 cr.
HRM 466	Senior Seminar in Human Resource Management	3 cr.
HRM 480	Internship in Human Resource Management	1-3 cr.

**Subtotal: 28-30**

Electives (12 credit hours)

GEN XXX	General Electives	12 cr.
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**Subtotal: 12**

Subtotal: 40-42

Total Credit Hours: 40-42

**Human Resource Management Suggested Sequence of Courses**

**Degree Requirements**

First and Sophomore Year

See Core Requirements for all Business Majors (p. 107)

**Subtotal: 60**

Junior Year - Fall Semester

BUS 326	Business Planning for New Ventures	3 cr.
	or	
BUS 312/HONB	Business Processes and	3 cr.

312	Enterprise Resource Planning with SAP	
MAN 303	Interpersonal Skills for Leading	3 cr.
HRM 436	Compensation and Benefits	3 cr.
HRM 480	Internship in Human Resource Management	1-3 cr.
LAB XXX	Laboratory Science	3 cr.
		<b>Subtotal: 15</b>

## Junior Year - Spring Semester

BL 308	Labor Management Relations	3 cr.
HRM 322	Managing a Diverse Workforce	3 cr.
HRM 323	Human Resource Management	3 cr.
CUL XXX	Global Cultures Perspective	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 15</b>

## Senior Year - Fall Semester

BL 424	Business Law for Human Resource Management	3 cr.
BIS 310	Quality and Operations Management	3 cr.
	or	
BIS 312	Quality and Operations Management with SAP	3 cr.
GEN XXX	General Elective	3 cr.
HRM 328	Human Resources Analytics	3 cr.
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.
		<b>Subtotal: 15</b>

## Senior Year - Spring Semester

BUS 450/HONB 450	Business Strategy	3 cr.
HRM 466	Senior Seminar in Human Resource Management	3 cr.
HRM 324	Performance Management	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 15</b>

Subtotal: 120

Total Credit Hours: 120

Students must take 30 credit hours of coursework in 300-400 level courses. All students must take 12 hours of upper level (300-400) courses in their major at Western New England University.

General electives must be selected in such a way to ensure that all "perspectives of understanding" requirements have been satisfied.

Courses to be included in computing the 2.0 minimum average in the major are as follows: All HRM, BL 308, BL 424, and MAN 303.

## Management and Leadership

## Management and Leadership Major

## General Information

The Management and Leadership program emphasizes the knowledge, competencies, and characteristics necessary for effective leadership in meeting organizational objectives and challenges. Students undertake a wide range of academic and experiential learning opportunities to develop the proactive, critical, and creative thinking skills needed for problem-solving, communication, commitment to excellence, and personal integrity that enable them to provide effective management and leadership in work and community settings. Certificate opportunities allow students the flexibility to develop and refine their personal business brand.

## Career Preparation

In order to help students understand careers available to Management and Leadership majors, faculty in the Department of Management designed activities to guide students from career exploration through career implementation. Examples of some of these include:

1. Career Exploration in the freshmen year is accomplished in BUS 110 through guest speakers from local businesses; and discussions about opportunities provided by certificates;
2. Career Investigation in the sophomore year courses includes to discussion on career choices in MAN 204/HONB 204;
3. Career Determination in the junior year is accomplished through a required internship, and résumé review and internship search with Career Services and exploration of Management and Leadership, including certificate options; and
4. Career Implementation in the senior year is addressed through participation in the "RealTest" Assessment Exercise. During this daylong event, students demonstrate their management and leadership abilities and are coached by local business people and alumni volunteers.

Majors are encouraged to select and declare one or more Management Department certificates to build on core management and leadership skills. This helps fine-tune your professional identity and brand yourself to meet market demands. Eligible Management certificates include Diversity, Socially-Conscious Management, Project Management, HR Fundamentals, and Remote Work Skills.

Students meeting major requirements are further encouraged to consider using elective credits to earn one additional management department certificate or combine work in Management with available certificates from other programs, such as SAP, SAS, or Innovation and Entrepreneurship to further distinguish their unique professional identity and career path.

## Career Opportunities

Management and Leadership majors are prepared to embark on a career path with the promise of increasing responsibility in a rapidly changing global environment.

Graduates work in a wide range of organizations and positions that include: manufacturing, corporate business, financial services, small business, hospitality industry, government, and public administration. Many enroll in graduate programs or law school. Our focus is on preparation for career-entry and our successful graduates typically enter businesses and organizations in entry-level professional positions.

**Management Faculty** (p. 106)

**Program Learning Goals**

Having completed a major in Management and Leadership, the student will have the ability to:

1. Understand and synthesize the basic concepts and theories of management and leadership that serve as a basis for high performance;
2. Apply theories and concepts of management and leadership to develop strategies for improving the performance of people and processes in organizations;
3. Perform well on teams, provide leadership, and contribute and collaborate to achieve team goals;
4. Demonstrate skill and competency in developmental performance feedback; and
5. Apply theories and concepts of management and leadership to develop strategies for dealing with organizational and interpersonal conflict.

See Core Requirements for All Business Majors (p. 107) and General University Requirements (p. 33) (78 credit hours)

For students interested in minoring in Management, see Description of Minors Programs in catalogue.

For students interested in pursuing related certificates in Management, Human Resources, or other business discipline, see Description of Certificate Programs in catalogue.

All Management and Leadership majors take core people and process courses that compose the Leadership Certificate, but majors still must formally declare that certificate before the last day of the semester preceding graduation. Certificates are not awarded automatically based on coursework.

**Degree Requirements**

Required Management and Business Law courses (24 credit hours)

MAN 303	Interpersonal Skills for Leading	3 cr.
MAN 315/SO 315	Organizational Theory	3 cr.
MAN 353	Leadership and Team Skills	3 cr.
MAN 3XX	Management Elective	3 cr.
MAN 3XX	Management Elective	3 cr.
MAN 3XX	Management Elective	3 cr.
MAN 466	Senior Seminar in Management and Leadership	3 cr.
MAN 480	Internship in Management	3 cr.
		<b>Subtotal: 24</b>

Electives (18 credit hours)

GEN XXX	General Electives	18 cr.
		<b>Subtotal: 18</b>

Management electives may include Management & Leadership certificates: Diversity Management, Socially-Conscious Management, Project Management, HR Fundamentals, and Remote Work Skills.

Subtotal: 42

Total Credit Hours: 42

**Management and Leadership Suggested Sequence of Courses**

**Degree Requirements**

First and Sophomore Year

See Core Requirements for all Business Majors (p. 107)

**Subtotal: 60**

**Junior Year - Fall Semester**

BUS 326	Business Planning for New Ventures	3 cr.
or		
BUS 312/HONB 312	Business Processes and Enterprise Resource Planning with SAP	3 cr.
GEN XXX	General Elective	3 cr.
MAN 303	Interpersonal Skills for Leading	3 cr.
MAN 3XX	Management Elective	3 cr.
LAB XXX	Laboratory Science	3 cr.
		<b>Subtotal: 15</b>

**Junior Year - Spring Semester**

CUL XXX	Global Cultures Perspective	3 cr.
MAN 315/SO 315	Organizational Theory	3 cr.
MAN 3XX	Management Elective	3 cr.
MAN 480	Internship in Management	3 cr.
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.
		<b>Subtotal: 15</b>

**Senior Year - Fall Semester**

BIS 310	Quality and Operations Management	3 cr.
or		
BIS 312	Quality and Operations Management with SAP	3 cr.
MAN 3XX	Management Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
MAN 353	Leadership and Team Skills	3 cr.



<b>Subtotal: 15</b>		
Senior Year - Spring Semester		
BUS 450/HONB 450	Business Strategy	3 cr.
MAN 466	Senior Seminar in Management and Leadership	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
<b>Subtotal: 15</b>		

Subtotal: 120

Total Credit Hours: 120

Students must take 30 credit hours of coursework in 300-400 level courses. All students must take 12 hours of upper level (300-400) courses in their major at Western New England University.

General electives must be selected in such a way to ensure that all "perspectives of understanding" requirements have been satisfied.

Courses to be included in computing the 2.0 minimum average in the major are as follows: MAN 303, all upper level MAN courses, and BUS 450/HONB 450.

Marketing

## Marketing Major

### General Information

Marketing is a dynamic force in today's multinational economy. Given the highly competitive nature of business, it is essential that business organizations understand and respond to the wants and needs of multiple markets. In order to manage markets successfully, marketing managers must employ a combination of good business judgment, effective analytical techniques, and professional communication skills. The Marketing program strives to provide students with abilities in each of these areas.

Students in the Marketing major learn how to develop their marketing skills to become efficient marketing managers. Course projects are designed to provide students with exposure to real world marketing management problems. Students often work in group on team projects where they meet with business clients, gather marketing information, and develop real-time marketing solutions.

### Career Preparation

In order to help students understand careers available to Marketing majors, faculty in the Department of Marketing design activities to guide students from career exploration through career implementation. Examples of some of these include:

1. Career Exploration in the freshman year is accomplished in BUS 110 Introduction to Business Seminar, where students are introduced to marketing career opportunities;
2. Career Investigation in the sophomore year courses includes classroom assignments in MK 200 which could include shadowing a marketing professional;
3. Career Determination in the junior year is accomplished using an assignment in MK 302 which is designed to help students

become more knowledgeable about career options and to assist students with selecting an appropriate career path; and

4. Career Implementation in the senior year includes résumé writing and review of job descriptions and responsibilities in MK 423, and in MK 480 Internship in Marketing where they experience marketing within an existing business.

### Career Opportunities

Students majoring in Marketing often pursue careers in marketing management, marketing research, sport marketing, sales and sales management, consumer relations, and product/brand management.

**Marketing Faculty** (p. 106)

### Program Learning Goals

Having completed a major in Marketing, the student will have the ability to:

1. Identify value offerings for key stakeholders;
2. Create value offerings for key stakeholders; and
3. Deliver value to key stakeholders.

See Core Requirements for All Business Majors (p. 107) and General University Requirements (p. 33) (78 credit hours)

## Degree Requirements

Required Marketing courses (12 credit hours)

MK 302	Market Analysis	3 cr.
MK 303	Customer Solutions	3 cr.
MK 423	Applied Marketing Capstone	3 cr.
MK 480	Internship In Marketing	3 cr.

**Subtotal: 12**

And three major electives (9 credits)

MK 3XX/4XX	Marketing Elective	3 cr.
MK 3XX/4XX	Marketing Elective	3 cr.
COMM 340	Business Communication	3 cr.
	or	
MK 3XX/4XX	Marketing Elective	3 cr.

**Subtotal: 9**

Electives (21 credit hours)

GEN XXX	General Electives	21 cr.
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**Subtotal: 21**

Subtotal: 42

Total Credit Hours: 42

## Marketing Suggested Sequence of Courses

### Degree Requirements

First and Sophomore Year

See Core Requirements for all Business Majors (p. 107)

**Subtotal: 60**

Junior Year - Fall Semester

BUS 326	Business Planning for New Ventures	3 cr.
	or	
BUS 312/HONB 312	Business Processes and Enterprise Resource Planning with SAP	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
LAB XXX	Laboratory Science	3 cr.
MK 302	Market Analysis	3 cr.

**Subtotal: 15**

Junior Year - Spring Semester

BIS 310	Quality and Operations Management	3 cr.
	or	
BIS 312	Quality and Operations Management with SAP	3 cr.
CUL XXX	Global Cultures Perspective	3 cr.
MK 303	Customer Solutions	3 cr.
COMM 340	Business Communication	3 cr.
	or	
MK 3XX/4XX	Marketing Elective	3 cr.
MK 3XX/4XX	Marketing Elective	3 cr.

**Subtotal: 15**

Senior Year - Fall Semester

BUS 423/BME 423/ME 423	Product Development and Innovation	3 cr.
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
MK 480	Internship In Marketing	3 cr.

**Subtotal: 15**

Senior Year - Spring Semester

MK 423	Applied Marketing Capstone	3 cr.
MK 3XX/4XX	Marketing Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN 3XX	General Elective	3 cr.

**Subtotal: 15**

Subtotal: 120

Total Credit Hours: 120

Students must take 30 credit hours of coursework in 300-400 level courses. All students must take 12 hours of upper level (300-400) courses in their major at Western New England University.

General electives must be selected in such a way to ensure that all "perspectives of understanding" GUR requirements are satisfied.

Courses to be included in computing the 2.0 minimum average in the major are as follows: All Marketing (MK) courses at the 300 level and higher, and COMM 340 (if taken as a marketing elective).

## Marketing Communication/Advertising Major

### General Information

Marketing and advertising are dynamically changing. New technologies enable interactive engagement with customers. Marketers who understand the current communication and digital environment and adjust company marketing communications have a competitive edge. The Marketing Communication/Advertising major prepares students to understand and to develop integrated marketing communication strategies. A unique feature of the Marketing Communication/Advertising program is that every student will develop a marketing communication plan for a business.

### Career Preparation

In order to help students understand careers available to Marketing Communication/Advertising majors, faculty in the Department of Marketing design activities to guide students from career exploration through career implementation. Examples of some of these include:

1. Career Exploration in the freshman year is accomplished in Introduction to Business Seminar (BUS 110) where students are introduced to marketing career opportunities;
2. Career Investigation in the sophomore year courses includes assignments in the Principles of Marketing course (MK 200);
3. Career Determination in the junior year is accomplished using an assignment in Market Analysis course (MK 302). The assignment helps students become more knowledgeable about career options and to assists students with selecting an appropriate career path; and
4. Career Implementation in the senior year includes a required internship (MK 485) and class assignments in Applied Marketing Capstone course (MK 423).

### Career Opportunities

Students majoring in Marketing Communication/Advertising often pursue careers in promotional management, marketing communication, direct marketing, public relations, and advertising account management.

**Marketing Faculty** (p. 106)

### Program Learning Goals

Having completed a major in Marketing Communication/Advertising, the student will have the ability to:

1. Understand the function of marketing communication strategy within the context of the overall marketing strategy;

2. Analyze marketing communication problems using analytics and appropriate theories;
3. Develop a marketing communication plan for a business.

See Core Requirements for All Business Majors (p. 107) and General University Requirements (p. 33) (78 credit hours)

### Degree Requirements

#### Required Marketing courses (22 credit hours)

MK 302	Market Analysis	3 cr.
MK 303	Customer Solutions	3 cr.
MK 372	Digital Media Marketing Strategies	3 cr.
MK 423	Applied Marketing Capstone	3 cr.
MK 485	Marketing Communication/Advertising Internship	3 cr.
COMM 245	Video Editing and Production	4 cr.
COMM 285	Introduction to Public Relations	3 cr.

**Subtotal: 22**

#### Electives - 20 credit hours

GEN XXX	General Electives	12 cr.
GEN XXX	General Elective	2 cr.
GEN 3XX/4XX	Upper Level General Elective	3 cr.
GEN 3XX/4XX	Upper Level General Elective	3 cr.

**Subtotal: 20**

Subtotal: 42

Total Credit Hours: 42

### Marketing Communication/Advertising Suggested Sequence of Courses

#### Degree Requirements

##### First and Sophomore Year

See Core Requirements for all Business Majors (p. 107)

**Subtotal: 60**

#### Junior Year - Fall Semester

BUS 326	Business Planning for New Ventures	3 cr.
	or	
BUS 312/HONB 312	Business Processes and Enterprise Resource Planning with SAP	3 cr.
COMM 245	Video Editing and Production	4 cr.
GEN XXX	General Elective	3 cr.
LAB XXX	Laboratory Science	3 cr.
MK 302	Market Analysis	3 cr.

**Subtotal: 16**

#### Junior Year - Spring Semester

BIS 310	Quality and Operations Management	3 cr.
	or	
BIS 312	Quality and Operations Management with SAP	3 cr.
COMM 285	Introduction to Public Relations	3 cr.
CUL XXX	Global Cultures Perspective	3 cr.
MK 303	Customer Solutions	3 cr.
MK 372	Digital Media Marketing Strategies	3 cr.

**Subtotal: 15**

#### Senior Year - Fall Semester

BUS 423/BME 423/ME 423	Product Development and Innovation	3 cr.
	or	
BUS 450/HONB 450	Business Strategy	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN 3XX/4XX	Upper Level General Elective	3 cr.
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.

**Subtotal: 15**

#### Senior Year - Spring Semester

GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	2 cr.
GEN 3XX/4XX	Upper Level General Elective	3 cr.
MK 423	Applied Marketing Capstone	3 cr.
MK 485	Marketing Communication/Advertising Internship	3 cr.

**Subtotal: 14**

Subtotal: 120

Total Credit Hours: 120

Students must take 30 credit hours of coursework in 300-400 level courses. All students must take 12 hours of upper level (300-400) courses in their major at Western New England University.

General electives must be selected in such a way to ensure that all "perspectives of understanding" requirements have been satisfied.

Courses to be included in computing the 2.0 minimum average in the major are as follows: All MK courses, COMM 245 and COMM 285.

Pharmaceutical & Healthcare Business Major

Formerly Pharmaceutical Business

## Pharmaceutical & Healthcare Business Major

### General InformationP

The Pharmaceutical & Healthcare Business major integrates the fields of pharmacy, healthcare, and business, while delivering a firm foundation in the sciences. Students majoring in Pharmaceutical & Healthcare Business develop a knowledge base to prepare them for entry into the pharmaceutical, biotechnology, medical diagnostic device, and other healthcare-related industries.

### Career Preparation

In order to help Pharmaceutical & Healthcare Business majors understand careers available to them, faculty design assignments and class projects to guide students from career exploration through career implementation. Examples of some of these include:

1. Career Exploration in the freshman year occurs in the Introduction to Business Seminar course (BUS 110) where students are introduced to business career opportunities;
2. Career Investigation in the sophomore year is accomplished by taking a series of interdisciplinary courses in the sciences and pharmaceutical & healthcare industries investigations, including Introduction to Healthcare Industries (PHARB 200);
3. Career Determination in the junior year is accomplished by completing a career assignment in the interdisciplinary course, Fundamentals of Pharmacy (PHARB 345); and
4. Career Implementation in the senior year includes an internship in the pharmaceutical, medical technology, or healthcare business industries (PHARB 480).

### Career Opportunities

The Pharmaceutical & Healthcare Business major is preparing for entry into a highly specialized and unique industry. Entry points into the industry include business operations, marketing, and management careers.

### Faculty

In this multidisciplinary major, students will learn from faculty in many disciplines, including accounting, biology, business information systems, chemistry, economics, finance, management, and marketing.

### Program Learning Goals

Having completed a major in Pharmaceutical & Healthcare Business, the student will have the ability to:

1. Understand the marketplace factors that affect pharmaceutical and healthcare businesses;
2. Understand the fundamental concepts of industry structure, government policy, and legal/regulatory issues in pharmaceutical and healthcare industries;
3. Apply science and business knowledge to different functions (marketing, management, information systems, finance, etc.) in businesses and organizations competing in the pharmaceutical and healthcare industries;
4. Demonstrate competency in pharmaceutical analytics as applied to the pharmaceutical and healthcare industries.

See Core Requirements for All Business Majors and General University Requirements (78 credit hours).

## Degree Requirements

Two lab science courses:

Pharmaceutical & Healthcare Business students must take BIO 101 and CHEM 101 which will fulfill the Natural Science Perspective General University Requirement

**Subtotal: 6**

Choose two of the following three Natural Science Perspectives courses, and the other major requirements listed:

BIO 157	Human Disease and Drug Therapy	3 cr.
	and/or	
BIO 158	Microbes and Society	3 cr.
	and/or	
CHEM 155	Drug Development Chemistry	3 cr.
PHARB 200	Introduction to Healthcare Industries	3 cr.
PHARB 345	Fundamentals of Pharmacy	3 cr.
PHARB 400	Introduction to Pharmaceutical Analytics	3 cr.
EC 345	The Pharmaceutical Business Environment	3 cr.
FIN 382	Healthcare Finance	3 cr.
PHARB 480	Internship in Pharma & Healthcare Business	3 cr.

**Subtotal: 24**

Electives 12 credit hours

GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN 3XX/4XX	Upper Level General Elective	3 cr.
GEN 3XX/4XX	Upper Level General Elective	3 cr.

**Subtotal: 12**

Subtotal: 42

Total Credit Hours: 42

## Pharmaceutical & Healthcare Business Suggested Sequence of Courses

### Degree Requirements

#### First and Sophomore Year

Students must follow all Core Requirements for all Business Majors (p. 107) with the following adjustments: students must take BIO 101 and CHEM 101 during their freshman year, PHARB 200 as well as one natural science perspective course during their sophomore year. In addition, COMM 233, HIST XXX and PSY 101, or SO 101. Students may take EC 111 or EC 112 in the freshman or sophomore year, or may take 2 general electives. The sequence below shows general electives.

(p. 107)

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**Subtotal: 60**

First Year

BIO 101	Basic Biology: Organisms	3 cr.
CHEM 101	Modern Chemistry I	3 cr.

Second Year

LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.
PHARB 200	Introduction to Healthcare Industries	3 cr.
EC 111	Principles of Microeconomics	3 cr.
EC 112	Principles of Macroeconomics	3 cr.

Junior Year - Fall Semester

GEN XXX	General Elective	3 cr.
BUS 312/HONB 312	Business Processes and Enterprise Resource Planning with SAP	3 cr.
GEN XXX	General Elective	3 cr.
PHARB 345	Fundamentals of Pharmacy	3 cr.
COMM 233	Business Writing and Communication	3 cr.

**Subtotal: 15**

Junior Year - Spring Semester

BIS 312	Quality and Operations Management with SAP	3 cr.
GEN 3XX	Upperlevel General Elective	3 cr.
PH 211	Business Ethics	3 cr.
FIN 382	Healthcare Finance	3 cr.
EC 345	The Pharmaceutical Business Environment	3 cr.

**Subtotal: 15**

Senior Year - Fall Semester

HIST XXX	History Perspective	3 cr.
BUS 423/BME 423/ME 423	Product Development and Innovation	3 cr.
GEN XXX	General Elective	3 cr.
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.
PSY 101	Introduction to Psychology or	3 cr.
SO 101	Introduction to Sociology	3 cr.

**Subtotal: 15**

Senior Year - Spring Semester

PHARB 400	Introduction to Pharmaceutical Analytics	3 cr.
CUL XXX	Global Cultures Perspective	3 cr.
PHARB 480	Internship in Pharma & Healthcare Business	3 cr.
GEN 3XX/4XX	Upper Level General Elective	3 cr.
GEN 3XX/4XX	Upper Level General Elective	3 cr.

**Subtotal: 15**

Subtotal: 120

Total Credit Hours: 120

\*Students are strongly encouraged to supplement their major coursework with a minor area of study related to their career plans. It is recommended that students consult with their advisor when deciding on a minor area of study.

Students must take 30 credit hours of coursework in 300-400 level courses. All students must take 12 hours of upper level (300-400) courses in their major at Western New England University.

General electives must be selected in such a way to ensure that all "perspectives of understanding" GUR requirements satisfied.

Courses to be included in computing the 2.0 minimum average in the major are as follows: All PHARB courses, BIO 157, BIO 158, CHEM 155, EC 345, and FIN 382

Sport Management

Sport Management Major

**General Information**

The Sport Management program emphasizes the business side of sports. Students majoring in Sport Management engage in a course of academic study that prepares them for a rewarding career in sport-related organizations. The Sport Management major understands the unique dynamics of the sport industry and is able to mobilize the resources available to meet the mission, goals, and objectives of both the sport organization and its stakeholders. The Sport Management program provides students with the opportunity to develop the knowledge and skills they need to manage within the sport industry. Students are also provided with industry-based learning opportunities and are actively involved in industry-based projects both in the classroom and beyond.

**Career Preparation**

In order to help students understand careers available to Sport Management majors, faculty in the Department of Sport Management designed activities to guide students from career exploration through career implementation. Examples of some of these include:

1. Career Exploration in the freshman year is accomplished through a speaker series, an alumni panel, and Sport Management Association activities;
2. Career Investigation in the sophomore year includes classroom assignments in SPMN 250 which look at opportunities in sport industry segments;
3. Career Determination in the junior year is accomplished using projects in SPMN 355 and SPMN 366; and

- Career Implementation in the senior year is addressed through instruction in networking and sport job search skills in SPMN 465 combined with internships and field experiences.

**Career Opportunities**

The Sport Management major is prepared to assume positions of responsibility in a wide variety of sport organizations in the private and public sectors. Graduates work in the following settings: professional sport, sport facility management, collegiate sport, sports clubs, health and fitness clubs, sports media, and the sporting goods industry, etc.

**Sport Management and Business Law Faculty** (p. 106)

**Program Learning Goals**

Having completed a major in Sport Management, the student will have the ability to:

- Develop an understanding of and ability to apply managerial competencies to domestic and international sport organizations
- Achieve competency in sport marketing including fundamental aspects of sport products, markets, consumer research, sponsorship, promotion, and digital/social media
- Achieve competency in the finance of sport organizations including key elements of budgeting, accounting, public/private joint financing, fundraising, and revenue development
- Achieve competency in legal aspects of sport including state/federal legislation, liability, risk management, contracts, and collective bargaining
- Achieve competency in the economics of sport including fundamental concepts of supply and demand, economic forecasting, and economic impact assessment
- Achieve competency in the management of sport facilities including fundamental concepts of planning, design, construction, and both front of house and back of house operations

**Practicum, Internship, and Advanced Field Experience Options**

Students majoring in Sport Management are afforded four different kinds of opportunities to apply their classroom learning to field experiences. All Sport Management majors must complete sport-industry based experiences as part of their curriculum.

Sport Management majors may complete a three-credit collegiate athletics course which provides students with the opportunity to plan, organize, and lead various elements of sport-related programming which may include intercollegiate athletic teams, intramurals, recreation, and health and wellness. Students gain hands-on experience in game operations, event management, sport promotion, and athletic communications while working directly under the supervision of Western New England University Department of Athletics staff. The course combines classroom instruction with on-site sport industry experience.

Sport Management majors who meet the University’s academic requirements for internships (junior standing and grade point average of 2.5 or above overall and in the major) are eligible for the 3 credit Internship in Sport Management.

Sport Management majors with a grade point average of 3.0 and above are eligible to apply for the Advanced Field Experience (SPMN 460/SPMN 461) program. This program places students in semester-long, full-time intern positions within a sport organization. In place of the 6 credit hours of electives, students in this program, earn 6 credit hours through a combination of the work they do at their placement site and a series of papers and presentations relating their field experience to the concepts and principles learned in their courses.

See Core Requirements for All Business Majors (p. 107) and General University Requirements (p. 33) (78 credit hours).

**Degree Requirements**

**Sport Management Degree Requirements**

SPMN 250	Managing Sport Organizations	3 cr.
SPMN 355	Sport Facility Planning and Management	3 cr.
EC 340	The Economics of Sports	3 cr.
SPMN 366	Sport Marketing	3 cr.
BL 360	Business Law for Sport Management	3 cr.
BL 388	Labor Management Relations in Sport	3 cr.
SPMN 465	Seminar in Sport Management	3 cr.
SPMN XXX	Sport Management Elective	3 cr.
SPMN 480	Internship in Sport Management	3 cr.
	or	
SPMN XXX	Sport Management Elective	3 cr.
SPMN XXX	Sport Management Elective	3 cr.

**Subtotal: 33**

\*BL 360 is considered a Business Core course and an equivalent to the BL 201 Business Law, therefore not included in the major GPA calculation.

**Electives (12 credit hours)**

GEN XXX	General Electives	12 cr.
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**Subtotal: 12**

Subtotal: 45

Total Credit Hours: 45

**Sport Management Suggested Sequence of Courses**

**Degree Requirements**

**First and Sophomore Year**

Students will take Core Requirements for all Business Majors (p. 107) with the exception of BL 201/HONB 201 and:

SPMN 250	Managing Sport Organizations	3 cr.
	(Taken Fall term Sophomore year)	

**Subtotal: 60**

**Junior Year - Fall Semester**

BUS 326	Business Planning for New Ventures	3 cr.	SPMN 480	Internship in Sport Management	3 cr.
	or		GEN XXX	General Elective	3 cr.
					<b>Subtotal: 15</b>
BUS 312/HONB 312	Business Processes and Enterprise Resource Planning with SAP	3 cr.	Subtotal: 120		
EC 340	The Economics of Sports	3 cr.	Total Credit Hours: 120		
SPMN 355	Sport Facility Planning and Management	3 cr.	This major offers the option of 6 credits of advanced field experience (using electives above).		
LAB XXX	Laboratory Science	3 cr.	Students must take 30 credit hours of coursework in 300-400 level courses. All students must take 12 hours of upper level (300-400) courses in their major at Western New England University.		
MAN 240/HONB 240	Business and Society	3 cr.	General electives must be selected in such a way to ensure that all "perspectives of understanding" requirements have been satisfied.		
	or		Courses to be included in computing the 2.0 minimum average in the major are as follows:		
PH 211	Business Ethics	3 cr.			
		<b>Subtotal: 15</b>			
Junior Year - Spring Semester			All SPMN courses, BL 388 and EC 340		
BL 360	Business Law for Sport Management	3 cr.			
CUL XXX	Global Cultures Perspective	3 cr.			
SPMN XXX	Sport Management Elective	3 cr.			
SPMN 366	Sport Marketing	3 cr.			
GEN XXX	General Elective	3 cr.			
		<b>Subtotal: 15</b>			
Senior Year - Fall Semester					
BIS 310	Quality and Operations Management	3 cr.			
	or				
BIS 312	Quality and Operations Management with SAP	3 cr.			
LAB/NSP XXX	Laboratory Science or Natural Science Perspective	3 cr.			
SPMN XXX	Sport Management Elective	3 cr.			
GEN XXX	General Elective	3 cr.			
GEN XXX	General Elective	3 cr.			
		<b>Subtotal: 15</b>			
Senior Year - Spring Semester					
BL 388	Labor Management Relations in Sport	3 cr.			
BUS 423/BME 423/ME 423	Product Development and Innovation	3 cr.			
	or				
BUS 450/HONB 450	Business Strategy	3 cr.			
SPMN 465	Seminar in Sport Management	3 cr.			
SPMN XXX	Sport Management Elective	3 cr.			
	or				

## College of Engineering

Dean S. Hossein Cheraghi  
Assistant Dean Richard Grabiec Jr.

The College of Engineering has been preparing students for successful engineering careers for over 50 years. Over that time we have been guided by an operating philosophy that acknowledges that our graduates will play significant roles fundamental to the health of our nation and of our globe. Throughout their careers they and their professional colleagues will advance the technological basis of our nation's economic health, defend our nation, and our way of life with the products of our craft; provide for the improved health and welfare of our citizenry; and improve the quality of life for all humankind—as the engineering profession has always been charged to do. Our graduates assume serious obligations upon beginning their careers.

The faculty is committed to seeing students succeed, with overall excellence in the teaching/learning enterprise being the primary goal. It is the faculty of the College of Engineering that is primarily responsible for developing and maintaining the environment supportive of learning for each student and for encouraging each student to reach for and achieve the highest goals possible.

### The Mission of the College of Engineering

The College of Engineering's mission is to provide undergraduate and graduate students an outstanding education in engineering through an environment of individual attention and support, dedicated and qualified faculty who are recognized in their fields, and modern facilities. Our graduates will possess the education and learning skills that enable them to put theory into practice, be professionally responsible engineers, and be leaders within the global community.

### The Vision of the College of Engineering

The College of Engineering will be recognized as a premier engineering institution with an emphasis on a contemporary undergraduate education, preferred by undergraduate and graduate students, faculty, prospective employers, and graduate schools nationally and internationally.

### The Core Values of the College of Engineering

We support the core beliefs of Western New England University and in particular we value:

#### *Student Centered Learning*

Promoting a learning environment based on a student first approach to ensure the success of our students.

#### *Discovery*

Contributing to the research, development, dissemination, and application of engineering knowledge, integrating theory, and practice

#### *Holistic Engineering and Leadership*

Providing an active learning pedagogy integrating knowledge across disciplines to cultivate leadership and decision making in solving complex problems to better serve humanity

#### *Responsibility*

Demonstrating integrity and accountability in all of our dealings

#### *Ethics and Professionalism*

Leading by actions characterized by ethics and professionalism

#### *Teamwork*

Providing pedagogy and opportunity for the development of successful teaming skills

#### *Community*

Being an active and collaborative part of Western New England University and the local, national, and global community

#### *Diversity and Internationalism*

Respecting the diversity of humankind, including but not limited to cultural, gender, and nationality differences

#### *Continuous Improvement*

Demonstrating successful continuous improvement processes of our College and its programs

### Programs of Study

The College of Engineering offers curricula leading to the degrees:  
Bachelor of Science in Biomedical Engineering (BSE)  
Bachelor of Science in Civil Engineering (BSE)

Bachelor of Science in Computer Engineering (BSE)  
Bachelor of Science in Construction Management (BSCMGT)  
Bachelor of Science in Electrical Engineering (BSE)  
Bachelor of Science in Industrial Engineering (BSE)  
Bachelor of Science in Mechanical Engineering (BSE)

The undergraduate degree programs in Biomedical, Civil, Computer, Electrical, Industrial, and Mechanical Engineering are accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

The faculty realizes the typical tentativeness with which an entering freshman declares a major upon entry. Accordingly, all of the curricula share a common set of courses during the first two semesters of study. Students utilize this time to explore potential career directions and make informed decisions, declaring a degree objective before beginning their second year studies.

All curricula are based on mathematics and the basic sciences coupled with engineering sciences, with specialization beginning in the second year. Each program is structured to build upon preceding coursework, with successively more challenging courses, culminating with a capstone design experience during the fourth year. Each program is intended to prepare students for either entry into professional practice, or advanced formal studies. With 40% of required coursework taught by faculty in the College of Arts and Sciences, each program also integrates liberal and professional learning to provide the balance needed by modern engineering practitioners.

The College of Engineering believes that engineering as a discipline is better learned than taught, and that much of the maturing of students into engineers comes through personal hands-on experiences acquired in laboratory, project, and formal internships at industry sites throughout the Northeast. Through these avenues modern practice plays vital roles in the student's education. Senior projects are very often suggested by, and sometimes conducted in association with, the technical community. The programs are quite flexible in arranging for joint industry-student efforts, and in accommodating the needs of full-time and part-time students. In addition, undergraduate research projects are arranged by the faculty of the College of Engineering.

While undergraduate courses are occasionally offered in the evenings, it is not possible to complete an entire degree program in the evening.



**Transfer Agreements**

Recognizing the important role of community colleges in the overall system of higher education and of cooperation among four-year colleges and universities with different emphases, the College of Engineering is making every effort to coordinate its programs with those of other institutions offering programs, such as engineering science, that provide the first two years of engineering study.

To date, joint admission agreements and/or transfer advising guides have been developed with the following community colleges: Greenfield, Holyoke, Berkshire, Hudson Valley, Manchester Technical, Quinsigimond, Asnuntuck, and Springfield Technical. Other agreements are being developed.

College of Engineering Department Chairs and Faculty

*Biomedical Engineering Faculty***Department of Biomedical Engineering**

Professor: Robert Gettens, Chair

Professor: Michael Rust

Associate Professors: Anthony English, Andrea Kwaczala

Assistant Professor: Devina Jaiswal

Instructor: Lisa Murray

*Civil and Environmental Engineering Faculty***Department of Civil and Environmental Engineering**

Professor: Kenneth Lee, Chair

Associate Professor: Moochul Shin

Assistant Professors: Myungseom Kim, Changhoon Lee, Katherine Schlef

*Construction Management***Department of Construction Management**

Professor: Kenneth Lee, Chair

*Industrial Engineering Faculty***Department of Industrial Engineering and Engineering Management**

Associate Professor: Christian M. Salmon, Chair

Professors: S. Hossein Cheraghi, Richard Grabiec

Associate Professors: Zhaoujun (Steven) Li, Seyed Niknam, Matthew Romoser

Assistant Professor: Robert Barron, Joseph Ekong

Professor Emeritus: Eric Haffner

*Electrical and Computer Engineering Faculty***Department of Electrical and Computer Engineering**

Professor: Neeraj Magotra, Chair

Professors: Steven Northrup, Kourosh Rahnamai

Associate Professors: Stephen Adamshick, John Burke, Amer Qouneh

Assistant Professors: Love (Kumar) Sah, Arnab Purkayastha

Professors Emeriti: William Bradley, Stephen Crist, Rene Dube, James Masi, James Moriarty, Ronald Musiak

*Mechanical Engineering Faculty***Department of Mechanical Engineering**

Associate Professor: Glenn Vallee, Interim Chair

Professors: Linda Ellen Jones, Mohammed Khosrowjerdi

Associate Professors: Seyedmehdi Mortazavi Zanjani

Assistant Professors: Jingru Benner, Vedang Chauhan, Jamileh Shojaeiarani, Jingzhou Zhao

Assistant Professor of Practice: Charles Roche

Professors Emeriti: Robert Azar, Alan Karplus, Walter Presz, Richard Veronesi, Said Dini

College of Engineering Special Academic Opportunities

Accelerated Five-Year and Six-Year Engineering Programs (p. 25)

**Honors: A Mark of Distinction**

The Honors distinction in the College of Engineering at Western New England University gives students added depth and breadth to their engineering education by taking introductory level courses with an Honors cohort of like-minded engineering students, then selecting interdisciplinary courses or research experiences in their engineering major. This distinction on your academic record is an ideal way to show graduate schools and potential employers that you are a person who takes the extra step to learn and excel.

**Honors Program**

The College of Engineering Honors Program at Western New England University is not a major in itself, but is open to students in any engineering field. It provides academically qualified and motivated students with a challenging pace of study, opportunities for broader consideration of core course themes, and advanced work in their areas of interest, which can be done individually and/or with the cohort, and under mentorship of the faculty.

**Admission**

Entering freshmen who have met the GPA and SAT and/or ACT recommendation will automatically be invited to apply to the College of Engineering Honors Program. Students who do not meet these criteria but still strongly wish to be considered for acceptance into the Program are also encouraged to apply. Qualified students will receive an invitation from the Honors Program Coordinator requesting confirmation of interest. Students accepting this invitation will subsequently be notified of admission to the College of Engineering Honors Program and then, be registered for the first engineering Honors course during Summer Orientation and Registration Program (SOAR).

**Requirements**

Students who have been admitted to the College of Engineering Honors Program must complete a selection of HON or HONE courses to meet the 18 semester-hours minimum, plus an honors project/thesis in their senior year in order to graduate with the University Honors. All honors students will be part of the cohort

taking the following core courses:

HONE 102 First Year Engineering Seminar

HONE 105 Computer Programming for Engineers

HONE 110 Data Acquisition and Processing

HONE 202 Statics

HONE 205 Circuits I- Electrical Engineering I

Students, sophomore status and above, also have the option of taking a faculty-directed research course (HONE 240, HONE 340) and/or Independent Study Course (HON 333/HONE 333) as two of their six honors courses, in addition to the honors-by-contract courses in their engineering major. Honors-by-contract courses are arrangements between the student and the sponsoring faculty to allow the student to go above and beyond the regular topics covered in the standard course and increase their depth of knowledge in the subject area.

**Senior Honors Project/Thesis**

Each College of Engineering Honors program senior works closely with a faculty advisor to develop a final project. Students must submit an Honors project as approved and overseen by the Honors Committee in the College of Engineering.

**Grand Challenges Scholars Program**

The Grand Challenges Scholars Program (GCSP) was envisioned by the National Academy of Engineering as the foundation of a new educational paradigm that prepares engineers to be innovators for change in an increasingly globalized society. This emerging educational paradigm is expected to yield a generation of engineers whom are uniquely qualified and motivated to address the most challenging problems facing the nation and the world. It is also expected to serve as a method to pilot innovative educational approaches that will become mainstream educational programs for all engineering students at universities across the nation.

**Program Components**

The GCSP stipulates that to earn the GCS designation, a student must engage with their engineering education from multiple perspectives that guide the development of an entrepreneurial and global perspective to society’s greatest challenges. These perspectives are integrated as five components in which the candidate will immerse at differing levels of experience depending on each candidate’s history and research interests. How the candidate fulfills the specific requirements is negotiated with the Western New England University Program Director in two stages.

The first stage has the student apply as a tentative candidate to the program during their freshman year. At this time the student is offered guidance on how to integrate the GSCP requirements with

their University curricular and extracurricular activities. In the second stage, the student applies for full admittance into the program in the Fall of their junior year. This admittance is based on the portfolio of courses and activities the student has engaged in during their freshman and sophomore years, as well as maintaining a 3.3 GPA. The GCSP committee assesses the student’s portfolio for likelihood of meeting the program requirements by the end of their senior year, and at this time will offer further guidance for program completion to earn the Grand Challenges Scholar designation.

The five components are:

Hands-on Project OR Research Experience: Related to a Grand Challenge 14 Thematic Area:

- Advance Personalized Learning Economical
- Enhance Virtual Reality
- Engineer Better Medicines Informatics
- Secure Cyberspace
- Improve Urban Infrastructure
- Provide Access to Clean Water Fusion
- Prevent Nuclear Terror Carbon Sequestration Methods
- Manage the Nitrogen Cycle for Scientific Discovery
- Make Solar Energy
- Reverse-Engineer the Brain
- Advance Health
- Restore and
- Provide Energy from Fusion
- Develop
- Engineering Tools

**Interdisciplinary Curriculum:** A curriculum that complements engineering fundamentals with courses in other fields, preparing engineering candidate to work at the overlap with public policy, business, law, ethics, human behavior, risk, and the arts, as well as medicine and the sciences.

**Entrepreneurship:** Preparing students to translate invention to innovation; to develop market ventures that scale to global solutions in the public interest.

**Global Dimension:** Develops candidate’s global perspective necessary to address challenges that are inherently global as well as to lead innovation in a global economy.

**Service Learning:** Developing and deepening candidate’s social consciousness and their motivation to bring their technical expertise to bear on societal problems through mentored experiential learning with real clients

For more information, visit the National Academy of Engineering (NAE) Grand Challenge Scholars Program website.

**Pre-Engineering**

**Admission to the College of Engineering**

The admission to any undergraduate program in the College of Engineering at Western New England University is based on the undergraduate admission criteria for the College. A student may be admitted to the College of Engineering in two ways: directly into a major or as a Pre-engineering student. A student is admitted directly into a major only if all College of Engineering admission criteria are met.

**Engineering Major**

Incoming students who meet all admission criteria will be admitted into one of the following majors: Biomedical Engineering, Civil Engineering, Computer Engineering, Electrical Engineering,

Industrial Engineering, or Mechanical Engineering. A student who meets the requirements for entering into a major within the College of Engineering, but is unsure of which major to pursue, may be admitted as an undeclared (ENGR) engineering student. A common curriculum for the first two semesters is provided for all engineering majors. Since the actual time required for completion of the curriculum will depend on the individual student's ability and prior preparation, personal consultations with engineering faculty advisors permit students to participate in both the determination of their current status and the planning and scheduling of further coursework.

#### Pre-engineering Students

Students not admitted into one of the above majors may be admitted as Pre-engineering students and should take the prescribed Pre-engineering program of study specified by the College of Engineering. A student's academic performance will be monitored by their engineering faculty adviser. Students can advance into an engineering major when the admissions criteria specified by the College of Engineering are satisfied. A Pre-engineering student may not enroll in any College of Engineering courses except for ENGR 100 and ENGR 105 until they have been certified by the College of Engineering as meeting the qualifications for placement as an engineering major.

Conditions for placement into an engineering major include the following:

- A grade of "C" or higher in both Calculus I and II (MATH 133, and MATH 134)
- A grade of "C" or higher in PHYS 133 or PHYS 132
- A minimum cumulative GPA of 2.0

Since the actual time required for completion of the curriculum will depend on the individual student's ability and prior preparation, personal consultations with their engineering faculty advisor permit students to participate in both the determination of their current status and the planning and scheduling of further coursework.

## Degree Requirements

### Pre-Engineering Student First-Year Course of Study

Based upon the results of a mathematics placement exam and demonstrated proficiency in the mathematics in high school or pre-calculus in College, a pre-engineering student could qualify to be placed into MATH 133, and PHYS 133 in the Fall semester and MATH 134, PHYS 134, and ENGR 105 in the Spring semester.

#### Freshmen Year - Fall Semester

ENGL 132	English Composition I	3 cr.
ENGR 100	Engineering Seminar & College Success Skills	2 cr.
MATH 109	Precalculus Mathematics	3 cr.
PHYS 131	Elements of Mechanics I	3 cr.
ENGR 105/HONE 105	Computer Programming for Engineers	2 cr.
		<b>Subtotal: 13</b>

#### Freshmen Year - Spring Semester

ENGL 133	English Composition II	3 cr.
MATH 130	Problem Solving in Calculus	1 cr.

MATH 133	Calculus I	4 cr.
PHYS 132	Elements of Mechanics II	4 cr.

**Subtotal: 12**

Subtotal: 25

Total Credit Hours: 25

## College of Engineering Requirements

A common curriculum for the first two semesters is provided for all engineering students. Since the actual time required for completion of the curriculum will depend on the individual student's ability and prior preparation, personal consultations with engineering faculty advisors permit students to participate in both the determination of their current status and the planning and scheduling of further coursework.

Course prerequisites are used to identify the competencies required for enrollment in a course. As a result, enrollment in any course is contingent upon successful completion of all course prerequisites. A student may, however, petition the course instructor for a waiver of prerequisite(s). Applications for requesting an exception are available in the Dean's Office. The application must be completed and signed by the student, faculty instructor, chair of the department that offers the course, and the Dean of Engineering.

Engineering majors can apply no more than 25% of business coursework to their graduation requirements.

### Mathematical Analysis

MATH 133 (Calculus I) and MATH 134 (Calculus II) have been designated as the two mathematics foundation courses by the College of Engineering. A minimum grade of C is required in MATH 133 in order to be allowed to continue into MATH 134. Furthermore, a minimum grade of C is required in MATH 134 in order to proceed into the sophomore level engineering courses ME 202 and EE 205.

## Degree Requirements

### Freshman Year - Fall Semester

ENGL 132	English Composition I	3 cr.
ENGR 102/HONE 102	First Year Engineering Seminar	1 cr.
ENGR 103	Introduction to Engineering	4 cr.
MATH 133	Calculus I	4 cr.
PHYS 133	Mechanics	4 cr.
		<b>Subtotal: 16</b>

### Freshman Year - Spring Semester

ENGL 133	English Composition II	3 cr.
ENGR 105/HONE 105	Computer Programming for Engineers	2 cr.
ENGR 110/HONE 110	Data Acquisition and Processing	3 cr.
MATH 134	Calculus II	4 cr.
PHYS 134	Electricity and Magnetism	4 cr.
		<b>Subtotal: 16</b>

Subtotal: 32

Total Credit Hours: 32

Individual curricula in Biomedical Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, Industrial Engineering, and Mechanical Engineering are given in the major programs section of the Catalogue.

### Design Experience

In the freshman year, students are introduced to engineering design, entrepreneurship, and product development and innovation in the Introduction to Engineering courses. Sophomore and junior courses and laboratories provide progressively more sophisticated design experiences within the student's discipline. All programs culminate in a capstone Senior Design Project course in which students work on projects under the supervision of a faculty advisor. Topics for some projects are supplied by industry. Students who select one of these topics have the opportunity to work with the industrial sponsor in an actual engineering setting.

### Electives (Undergraduate Programs)

General Education electives supplement the engineering student's technical program. These electives must be selected in such a way that all General Education "perspectives of understanding" requirements are covered. In addition, technical, design, and general electives provide the opportunity for specialization within a chosen field. An assigned departmental faculty advisor must approve selection of electives from Engineering, Arts and Sciences, or Business.

Biomedical Engineering

## Biomedical Engineering Major

### General Information

Biomedical engineers have the unique ability to serve as a bridge between engineering and medicine. The rapid advancement of high technology into all medical specialties has increased the demand for engineers who have a depth of knowledge in both engineering and physiology. Biomedical engineers make significant contributions to society by improving patient care and ultimately improving the quality of life for others.

Western New England University provides Biomedical Engineering students with a solid engineering background and an in-depth understanding of human physiology, anatomy, and biology necessary to be a successful biomedical engineer. The curriculum is designed for maximum flexibility, allowing students to choose elective courses that are of most interest. In the junior and senior year, students choose four "sequence electives," two technical electives, as well as a series of four general education courses that fulfill the University's requirement for a perspective on ethics, history, aesthetics, cultural studies, and social and behavioral issues. Students are exposed to the major physiological systems during each of the final four semesters through laboratory work, courses, and through the capstone Senior Design Project.

The program leading to the BSE degree is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>. Accreditation affirms our quality.

### Career Opportunities

The Biomedical Engineering program at Western New England University is designed to prepare students for either immediate employment or for admission to graduate or medical school. Demand for biomedical engineers is growing as more and more technology is finding its way into all branches of medicine. Since the field of biomedical engineering is so broad, many of our graduates choose to specialize their knowledge in graduate or professional school by pursuing an MS, PhD, or MD degree. Our graduates are working in

the medical instrumentation and device industry, pharmaceutical companies, biotechnology companies, research facilities, and hospitals.

### Biomedical Engineering Faculty (p. 128)

### Mission

The mission of the Biomedical Engineering program is to provide students with a supportive environment that facilitates learning to solve engineering problems related to medicine and biology in an ethically responsible manner.

The Biomedical Engineering program is committed to excellence in student learning. Graduates of the program will be problem solvers, able to apply engineering principles to the interface between living and non-living systems. The faculty and staff of the BME program use their diverse background in teaching, research, and industry to prepare students to be successful leaders in biomedical engineering as they move into the workforce, graduate school, or professional school.

### Defining Characteristics

The Biomedical Engineering program:

- provides students opportunities to learn and apply core engineering principles to solve problems related to medicine or biology, emphasizing the need for interdisciplinary approaches;
- gives students opportunities to apply theory with practice-oriented laboratory, industrial or clinical experiences;
- produces engineers who can communicate well at all levels within an organization;
- delivers a dynamic curriculum that is continuously updated with input from practitioners and researchers in the field of biomedical engineering;
- promotes biomedical engineering as a career choice; and
- serves both the biomedical engineering community and society.

### Educational Objectives

Graduates of the Western New England University Biomedical Engineering Program will, in their professional endeavors,

- function as productive team members and leaders in a variety of environments including industrial, hospital/clinical, governmental, graduate or professional school; solving engineering problems, including those at the interface of medicine and engineering while continuing to uphold safety, sustainability and/or ethical concerns.
- be actively engaged in life-long learning such as participating or leading relevant professional societies, continuing their education, or attending relevant workshops, meetings, or seminars.

### Student Outcomes

Accordingly, the program has documented student outcomes that support the program educational objectives. Attainment of these outcomes prepares graduates to enter the professional practice of engineering.

### Student Outcomes

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

3. an ability to communicate effectively with a range of audiences

4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts

5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

See College of Engineering Requirements (p. 130) and General University Requirements (p. 33).

## Degree Requirements

### Freshman Year - Fall Semester

ENGL 132	English Composition I	3 cr.
ENGR 102/HONE 102	First Year Engineering Seminar	1 cr.
ENGR 103	Introduction to Engineering	4 cr.
MATH 133	Calculus I	4 cr.
PHYS 133	Mechanics	4 cr.
		<b>Subtotal: 16</b>

### Freshman Year - Spring Semester

ENGL 133	English Composition II	3 cr.
ENGR 110/HONE 110	Data Acquisition and Processing	3 cr.
MATH 134	Calculus II	4 cr.
ENGR 105/HONE 105	Computer Programming for Engineers	2 cr.
PHYS 134	Electricity and Magnetism	4 cr.
		<b>Subtotal: 16</b>

### Sophomore Year - Fall Semester

BME 201	Foundations of Biomedical Engineering	3 cr.
BIO 107	General Biology I	3 cr.
BIO 117	General Biology Laboratory I	1 cr.
CHEM 105	General Chemistry I	4 cr.

EE 205/HONE 205	Electrical Engineering I	4 cr.
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MATH 236	Differential Equations	3 cr.
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**Subtotal: 18**

### Sophomore Year - Spring Semester

BME 202	Biomedical Systems	3 cr.
BME 206	Biomedical Sophomore Laboratory	1 cr.
BME 240	Biomaterials	3 cr.
CHEM 106	General Chemistry II	4 cr.
IE 212	Probability and Statistics	3 cr.
MATH 235	Calculus III	3 cr.

**Subtotal: 17**

### Junior Year - Fall Semester

BME 301	Engineering Physiology I	3 cr.
BME 305	Biomedical Engineering Laboratory I	1 cr.
BME 331	Bioinstrumentation	3 cr.
MATH 350	Vector Calculus and Fourier Series	3 cr.
XXX XXX	Sequence Elective	3 cr.
SBP XXX	Social/Behavioral Perspective	3 cr.

**Subtotal: 16**

### Junior Year - Spring Semester

BME 302	Engineering Physiology II	3 cr.
BME 306	Biomedical Engineering Laboratory II	1 cr.
BME 351	Biomechanics I	3 cr.
XXX XXX	Sequence Elective	3 cr.
HIST XXX	Historical Perspective	3 cr.

**Subtotal: 13**

### Senior Year - Fall Semester

BME 405	Biomedical Engineering Senior Laboratory	1 cr.
BME 437	Senior Design Projects I	3 cr.
BME 451	Biomechanics II	3 cr.
XXX XXX	Sequence Elective	3 cr.
BME xxx	Technical Elective	3 cr.
PH XXX	Ethical Perspective	3 cr.

**Subtotal: 16**

### Senior Year - Spring Semester

BME 440	Senior Design Projects II	3 cr.
BME 450	Biotransport Processes	3 cr.
xxx	Technical Elective	3 cr.

XXX XXX	Sequence Elective	3 cr.
CUL XXX	Global Cultures Perspective	3 cr.

**Subtotal: 15**

1. General Education courses must be selected in such a way to insure that all “perspective of understanding” requirements have been satisfied.

Subtotal: 127

Total Credit Hours: 127

The 2.0 required minimum grade point average in the major is based upon all BME courses pursued as a part of the student’s degree program.

**Biomedical Engineering Technical Elective**

Any course labeled BME xxx that is not part of the required curriculum may be used to fulfill the BME technical elective.

**Technical Elective**

Any 200-level or above math or science course or any 300-level or above engineering course may be used to fulfill the technical elective.

**Biomedical Engineering Sequence Electives**

In the junior and senior years, there are a series of four “sequence elective” courses for which the students may choose one of the following sequences of courses. Additional sequences are possible but must be made in consultation with the student’s academic advisor.

**Sequence Electives**

**Bioinstrumentation Sequence**

BME 332	Biomedical Imaging	3 cr.
CPE 271	Digital System Design	4 cr.
BME 431	Advanced Bioinstrumentation	3 cr.
BME 434	Biosensors, BioMEMS, and Nanomedicine	3 cr.

**Biomaterials Sequence**

CHEM 211	Analytical Methods	3 cr.
CHEM 221	Analytical Methods Laboratory	1 cr.
CHEM 317	Physical Chemistry I	3 cr.
CHEM 327	Physical Chemistry Laboratory I	1 cr.

Plus two of the following three courses:

BME 434	Biosensors, BioMEMS, and Nanomedicine	3 cr.
BME 443	Advanced Biomedical Materials and Medical Devices	3 cr.
ME 322	Manufacturing Processes	3 cr.

**Biomedical Micro and Nanodevices Sequence**

CHEM 211	Analytical Methods	3 cr.
BIO 117	General Biology Laboratory I	1 cr.
BIO 203	Microbiology	4 cr.
BME 432	Lab on a Chip	3 cr.

BME 434	Biosensors, BioMEMS, and Nanomedicine	3 cr.
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**Business Sequence**

MAN 204/HONB 204	Management and Organizational Behavior	3 cr.
MK 200/HONB 200	Principles of Marketing	3 cr.

Plus two of the following courses:

ENTR 251	Entrepreneurship and Innovation	3 cr.
MAN 303	Interpersonal Skills for Leading	3 cr.
MAN 370	Project Management	3 cr.
BUS 423/BME 423/ME 423	Product Development and Innovation	3 cr.

**Cell and Tissue Engineering Sequence**

BME 460	Cell and Tissue Engineering	3 cr.
CHEM 209	Organic Chemistry I	3 cr.
CHEM 210	Organic Chemistry II	3 cr.
	And	
BIO 320	Principles of Biochemistry	3 cr.
	or	
CHEM 314	Biochemistry	3 cr.

**Manufacturing Sequence**

IE 326	Production Planning and Control	3 cr.
IE 312	Engineering Economic Analysis	3 cr.
ME 322	Manufacturing Processes	3 cr.
IE 315	Quality Control and Engineering Statistics	3 cr.

**Medical Imaging Sequence**

EE 314	Electromagnetic Fields and Waves	3 cr.
EE 302	Introduction to Digital Signal Processing	3 cr.
PHYS 301	Optics	3 cr.
BME 332	Biomedical Imaging	3 cr.

**Premedical Sequence**

BIO 108	General Biology II	3 cr.
BIO 118	General Biology Laboratory II	1 cr.
CHEM 209	Organic Chemistry I	3 cr.
CHEM 210	Organic Chemistry II	3 cr.
CHEM 314	Biochemistry	3 cr.

**Premedical Students**

Biomedical Engineering students intending to apply to medical school are advised to select the premedical elective sequence and seek the advice of their BME advisor and the campus premedical advisor as soon as practical.

Additional courses in Genetics, Cellular Physiology, and Human Anatomy are available through the Cooperating Colleges of Greater Springfield (CCGS).

#### Prosthetics and Orthotics Sequence

BME 425	Prosthetic and Orthotic Devices	3 cr.
Plus three of the following courses:		
PSY 201	Developmental Psychology	3 cr.
PSY 326	Abnormal Psychology	3 cr.
BME 443	Advanced Biomedical Materials and Medical Devices	3 cr.
CPE 271	Digital System Design	4 cr.
CPE 310	Microprocessors I	3 cr.
EE 302	Introduction to Digital Signal Processing	3 cr.
EE 338	Electric Drives	3 cr.
EE 422	Control Systems	3 cr.
EE 445/EE 545	Neural Networks - Deep Learning	3 cr.
ME 449	Computer-Aided Engineering	3 cr.

\*Note: Students interested in pursuing a Certification in Prosthetics and Orthotics after graduation should take both Psychology courses.

**University-Wide Requirements:** A total of four University-wide requirement courses are listed in the Biomedical Engineering curriculum. These courses will be used to satisfy the requirement that all Western New England University students attain a perspective on: Ethics, History, Aesthetics, Cultural Studies, and Social and Behavioral issues.

#### Accelerated Five-year B.S. Biomedical Engineering and M.S. Pharmaceutical Sciences

The College of Engineering and the College of Pharmacy and Health Sciences at Western New England University have collaborated to offer a program unique to western Massachusetts for those students interested in attaining a Bachelor of Science in Engineering (BSE)—Biomedical Engineering and furthering their career aspirations with a thesis-based Masters of Science in Pharmaceutical Sciences (MSPS). This is a dual degree program, where students completing the requirements for each program will receive two separate degrees, with just one additional year of study beyond the normal 4-year Bachelors program.

Students can earn both the BSE and the MSPS degree within five years of entry as an undergraduate. Students admitted by WNE Admissions as undergraduates are only admitted into the BS degree portion of the program. Transition into the MSPS program is not automatic, nor is acceptance into the MSPS program guaranteed, but requires application and acceptance into the MSPS program. The MSPS program admission requirements can be found in the “Master of Science in Pharmaceutical Sciences” program in this catalogue.

Students in good standing in the BSE program are eligible to apply for admission to the MSPS degree program during their sophomore year after December 1. Candidates must successfully submit their application materials, as well as complete an admissions interview.

Students choosing this unique curricular path will need to closely

follow a prescribed sequence of courses and should consult closely with their advisor. The first two years of study will remain the same as the BSE curriculum. Beginning in the third year, the student will take courses in both the Colleges of Engineering and Pharmacy and Health Sciences. At the end of the fourth year, the student will graduate with the BSE degree and will exclusively take MS courses starting that summer.

Students in the BSE major that either (a) do not meet the MSPS program admission requirements during their sophomore year, or (b) elect not to apply for admission to the MSPS program at that time, remain eligible to apply for admission as part of the general applicant pool following four years of University study and completion of a bachelor’s degree.

#### Degree Requirements

84 TOTAL CREDIT HOURS OVER THE THREE DUAL-DEGREE YEARS

##### 3rd Year - Fall Semester

BME 301	Engineering Physiology I	3 cr.
BME 305	Biomedical Engineering Laboratory I	1 cr.
BME 331	Bioinstrumentation	3 cr.
MATH 350	Vector Calculus and Fourier Series	3 cr.
PHAR 513	Biochemistry	3 cr.
PHAR 514	Pharmaceutics I	2 cr.
BME 342	Drug Delivery	3 cr.

**Subtotal: 18**

\* Note: BME 342 “Drug Delivery” is offered in the fall semester of odd years. Students entering the 3rd year of study on an even year should take PHAR 512 “Immunology” in its place and take BME 342 in the fall of the 4th year.

##### 3rd Year - Spring Semester

BME 302	Engineering Physiology II	3 cr.
BME 306	Biomedical Engineering Laboratory II	1 cr.
BME 351	Biomechanics I	3 cr.
HIST XXX	Historical Perspective	3 cr.
CUL XXX	Cultural/Aesthetic Perspective	3 cr.
PHAR 524	Pharmaceutics II	2 cr.
PHAR 525	Pharmaceutics II Lab	1 cr.
SBP XXX	Social/Behavioral Science Requirement	3 cr.

**Subtotal: 19**

##### 4th Year - Fall Semester

BME 405	Biomedical Engineering Senior Laboratory	1 cr.
BME 437	Senior Design Projects I	3 cr.
BME 451	Biomechanics II	3 cr.

PHAR 512	Immunology	3 cr.
PHAR 611	Principles of Pharmacology	3 cr.
PHRSC 510	Seminar & Journal Club 1	1 cr.
PHRSC 527	Data Analysis & Biostatistics	3 cr.

**Subtotal: 17**

4th Year - Spring Semester

BME 440	Senior Design Projects II	3 cr.
BME 450	Biotransport Processes	3 cr.
PHAR 522	Pathophysiology	3 cr.
PHAR 523	Genetics & Genomics	2 cr.
PH XXX	Ethical Perspective	3 cr.
PHRSC 520	Seminar & Journal Club 2	1 cr.
PHRSC 526	Analytical Techniques Lab	1 cr.

**Subtotal: 16**

4th Year - Summer

PHRSC 528	Thesis Research 1	2 cr.
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**Subtotal: 2**

5th Year - Fall Semester

PHRSC 610	Seminar & Journal Club 3	1 cr.
PHRSC 618	Thesis Research 2	2 cr.
PHAR 612	Principles of Medicinal Chemistry	3 cr.

**Subtotal: 6**

5th Year - Spring Semester

PHRSC 620	Seminar & Journal Club 4	1 cr.
PHRSC 628	Thesis Research 3	2 cr.
PHRSC-PHAR-GEN xxx	Pharmacy Science-Pharmacy-General Elective	3 cr.

**Subtotal: 6**

Subtotal: 84

Total Credit Hours: 84

### Accelerated Six-Year Engineering/Law Program

Certain Biomedical Engineering students have the opportunity to accelerate their attainment of a BSE in Biomedical Engineering and a Law degree. Entrance requirements and standards necessary to maintain a tentative acceptance to the School of Law can be found in the “Six-year Engineering/Law Program” section of this catalogue.

Students choosing this unique curricular path will need to closely follow a prescribed sequence of courses and should consult closely with their advisor. The first two years of study will remain the same as the BME curriculum. The third year will change slightly to accommodate the senior year when the student will take both

Engineering and School of Law courses. Some summer School of Law courses will be necessary after the fourth year.

### Five-Year Bachelor/MBA Program

This program allows undergraduate Biomedical Engineering majors in the College of Engineering to accelerate the completion of the Bachelor of Science in Engineering (BSE)—Biomedical Engineering and to earn a master’s degree in Business Administration (MBA) with just one additional year of study.

### Five-Year Bachelor/Master of Science in Engineering Management Program

This program allows undergraduate Biomedical Engineering majors in the College of Engineering to accelerate the completion of the Bachelor of Science in Engineering (BSE) degree in Biomedical Engineering and to earn a Master of Science (MS) degree in Engineering Management with just one additional year of study.

Civil and Environmental Engineering

### Civil Engineering Major

#### General information

Our nation’s success has been built on the foundation of our solid infrastructure. Today, thousands of public works projects in the United States are in desperate need of repair and many more new infrastructure developments are necessary to keep our country competitive in the global community. There has never been a greater need for talented civil and environmental engineers to plan, execute, and lead these important projects.

The College of Engineering’s Civil Engineering major educates students to become leaders in this important and in-demand profession. The Civil Engineering major provides students with a broad and well-integrated background in the concepts, theories, and methodologies needed to plan, design, analyze, develop, organize, and manage civil and environmental engineering projects. Students work with state-of-the-art equipment in our new concrete/structures, transportation, environmental/water resources, and soil mechanics laboratories.

The Civil Engineering major focuses on the latest advances in the design, construction, and maintenance of society’s infrastructure – roads, railroads, buildings, airports, seaports, tunnels, dams, bridges, pipelines, water treatment and supply networks, and environmental systems. Students study major areas of civil engineering: structural engineering, transportation engineering, geotechnical engineering, environmental engineering, water resources engineering, and construction engineering. Students also study alternative/renewable energy, sustainable materials, and green building laws.

Civil Engineering students select one of four concentrations starting their junior year. They can select the Civil Engineering concentration, the Environmental Engineering concentration, the Reservoir Engineering concentration, or the Railway Engineering concentration. The first two years of the curriculum are the same for all Civil Engineering students. The selection of courses for the last two years is moderately different depending on the concentration. Note that any concentration leads to a successful career in civil engineering and selection of concentration should be based on personal preference and in consultation of career goals with an academic advisor.

The Bachelor of Science in Civil Engineering program is accredited by the Engineering Accreditation Commission of ABET, [www.abet.org](http://www.abet.org)



**Career Opportunities**

The Civil Engineering concentration provides a solid foundation in major sub-disciplines of civil engineering that leads to employment in both private and public sectors of industry or military. Examples of career opportunities include city/county/state organizations, federal agencies, and small to large private engineering firms. The career outlook for civil engineers is bright as the Bureau of Labor Statistics projects an employment growth rate of 11% over the decade of 2016-2026.

The Environmental Engineering concentration provides a solid foundation in major sub-disciplines of civil engineering with an emphasis on environmental and water resources engineering. This concentration leads to employment in both private and public sectors of industry or military. Examples of career opportunities include state and federal agencies, water or wastewater treatment plants, environmental laboratories, and small to large private engineering firms. The career outlook for environmental engineers is bright as the Bureau of Labor Statistics projects an employment growth rate of 8% over the decade of 2016-2026.

The Reservoir Engineering concentration provides a solid foundation in major sub-disciplines of civil engineering with an emphasis on reservoir engineering. This concentration leads to employments in both private and public sectors of industry. Examples of career opportunities include state and federal agencies, private petroleum companies, and small to large private engineering firms. The Railway Engineering concentration provides a solid foundation in major sub-disciplines of civil engineering with an emphasis on railway engineering. This concentration leads to employment in both private and public sectors of industry. Examples of career opportunities include state and federal agencies, and small to large private engineering firms.

**Civil and Environmental Engineering Faculty (p. 128)**

**Electives**

Electives supplement the engineering student’s technical program. These electives must be selected in such a way that all General Education “perspective of understanding” requirements are covered. In addition, technical, design, and general electives provide the opportunity for specialization within a chosen field. An assigned departmental faculty advisor must approve selection of electives from engineering, mathematics, science, or business.

**Vision**

The vision of the Department of Civil and Environmental Engineering is to be regionally, nationally, and internationally recognized in providing civil engineering education, leading to well-qualified engineers who are innovative, immediate contributors to their profession and successful in advanced studies.

**Mission**

The mission of the Civil Engineering program is to provide students with a supportive environment that facilitates learning to solve problems in civil and environmental engineering. The faculty and staff of the program use their background in teaching, research, and industry to prepare students to be successful as they move into the workforce or graduate school.

**Educational Objectives**

Our graduates will:

a. Demonstrate a strong fundamental scientific and technical knowledge base and critical thinking skills.

- b. Actively engage in lifelong learning related to the civil engineering profession.
- c. Plan, design, analyze, develop, organize, and manage civil and environmental engineering projects.
- d. Demonstrate expertise in major sub-disciplines of civil engineering: structural engineering, transportation engineering, geotechnical engineering, environmental and water resources engineering.

**Student Outcomes**

Accordingly, the program has documented student outcomes that support the program educational objectives. Attainment of these outcomes prepares graduates to enter the professional practice of engineering.

**Student Outcomes**

- 1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- 2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
- 3. an ability to communicate effectively with a range of audiences
- 4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
- 5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
- 6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- 7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

**Degree Requirements**

**Freshman Year - Fall Semester**

ENGL 132	English Composition I	3 cr.
ENGR 102/HONE 102	First Year Engineering Seminar	1 cr.
ENGR 103	Introduction to Engineering	4 cr.
MATH 133	Calculus I	4 cr.
PHYS 133	Mechanics	4 cr.

**Subtotal: 16**

**Freshman Year - Spring Semester**

ENGL 133	English Composition II	3 cr.
ENGR 105/HONE 105	Computer Programming for Engineers	2 cr.

ENGR 110/HONE 110	Data Acquisition and Processing	3 cr.
MATH 134	Calculus II	4 cr.
PHYS 134	Electricity and Magnetism	4 cr.

**Subtotal: 16**

Sophomore Year - Fall Semester

CEE 251	Surveying	3 cr.
CEE 253	Surveying Laboratory	1 cr.
ME 202/HONE 202	Statics	3 cr.
CHEM 105	General Chemistry I	4 cr.
MATH 236	Differential Equations	3 cr.
SBP XXX	Social/Behavioral Sciences Perspective	3 cr.

**Subtotal: 17**

Sophomore Year - Spring Semester

CEE 240	Strength of Civil Engineering Materials	3 cr.
CEE 242	Strength of Civil Engineering Laboratory	1 cr.
ME 203	Dynamics	3 cr.
CHEM 106	General Chemistry II	4 cr.
MATH 235	Calculus III	3 cr.
HIST XXX	Historical Perspective	3 cr.

**Subtotal: 17**

Subtotal: 66

Total Credit Hours: 66

### Civil Engineering Concentration

Starting junior year, a student may choose the Civil Engineering concentration, the Environmental Engineering concentration, or the Reservoir Concentration. The Civil Engineering concentration is well suited for students planning on a career in structural engineering, transportation engineering, geotechnical engineering, or water resources engineering.

### Degree Requirements

Junior Year - Fall Semester

CEE 341	Structural Analysis	3 cr.
CEE 351	Transportation Engineering	3 cr.
CEE 353	Transportation Engineering Laboratory	1 cr.
CEE 361	Engineering Fluid Mechanics	3 cr.
xxx	Civil Engineering Science Elective	3 cr.
CUL XXX	Cultural/Aesthetic Perspective	3 cr.

**Subtotal: 16**

Junior Year - Spring Semester

CEE 330	Soil Mechanics	3 cr.
CEE 332	Soil Mechanics Laboratory	1 cr.
CEE 342	Steel & Reinforced Concrete	3 cr.
IE 212	Probability and Statistics	3 cr.
PH XXX	Ethical Perspective	3 cr.
xxx	Technical or Design or General Elective	3 cr.

**Subtotal: 16**

Senior Year - Fall Semester

CEE 400	Ethical and Professional Issues	1 cr.
CEE 430	Geotechnical Engineering	3 cr.
CEE 461	Water Resources Engineering	3 cr.
CEE 470	Construction Engineering	3 cr.
xxx	Technical or Design Elective	3 cr.
xxx	Technical or Design or General Elective	3 cr.

**Subtotal: 16**

Senior Year - Spring Semester

CEE 320	Environmental Engineering	3 cr.
CEE 322	Environmental Engineering Laboratory	1 cr.
CEE 402	Capstone Design	3 cr.
CEE 451	Construction Materials	3 cr.
xxx	Technical or Design Elective	3 cr.

**Subtotal: 13**

Subtotal: 61

Total Credit Hours: 61

1. Technical or design electives are engineering, math, science, or computer courses normally numbered 300 or above and approved by the advisor.
2. General Education courses must be selected in such a way to insure all "perspectives of understanding" (p. 34) requirements have been satisfied.
3. General elective. Selected on approval of the academic advisor.
4. A student selects one course from the list to satisfy the Civil Engineering Science elective - GEOL 101, BIO 101, METR 101.

The 2.0 required minimum grade point average in the major is based upon all major courses pursued as a part of the student's major program.

### Environmental Engineering Concentration

The Environmental Engineering concentration is well suited for students planning on a career in environmental engineering, water resources engineering, or geotechnical engineering.

### Degree Requirements

Junior Year - Fall Semester

CEE 341	Structural Analysis	3 cr.
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CEE 351	Transportation Engineering	3 cr.
CEE 353	Transportation Engineering Laboratory	1 cr.
CEE 361	Engineering Fluid Mechanics	3 cr.
xxx	Civil Engineering Science Elective	3 cr.
xxx	Environmental Elective	3 cr.

**Subtotal: 16**

## Junior Year - Spring Semester

CEE 324	Groundwater Engineering	3 cr.
CEE 330	Soil Mechanics	3 cr.
CEE 332	Soil Mechanics Laboratory	1 cr.
CEE 342	Steel & Reinforced Concrete	3 cr.
IE 212	Probability and Statistics	3 cr.
PH XXX	Ethical Perspective	3 cr.

**Subtotal: 16**

## Senior Year - Fall Semester

CEE 400	Ethical and Professional Issues	1 cr.
CEE 430	Geotechnical Engineering	3 cr.
CEE 461	Water Resources Engineering	3 cr.
CEE 470	Construction Engineering	3 cr.
xxx	Technical or Design Elective	3 cr.
xxx	Environmental Elective	3 cr.

**Subtotal: 16**

## Senior Year - Spring Semester

CEE 320	Environmental Engineering	3 cr.
CEE 322	Environmental Engineering Laboratory	1 cr.
CEE 402	Capstone Design	3 cr.
xxx	Technical or Design Elective	3 cr.
CUL XXX	Cultural/Aesthetic Perspective	3 cr.

**Subtotal: 13**

Subtotal: 61

Total Credit Hours: 61

1. Technical or design electives are engineering, math, science, or computer courses normally numbered 300 or above and approved by the advisor.

2. General Education courses must be selected in such a way to insure all "perspectives of understanding" (p. 34) requirements have been satisfied.

3. A student selects one course from the list to satisfy the Civil Engineering Science elective - GEOL 101, BIO 101, METR 101.

4. A student selects two courses from the list below to satisfy the Environmental Electives (CEE 325, CHEM 209, ME 303, BIO 153, BIO 107). Students taking CHEM 209 and/or BIO 107 will take a one credit laboratory.

The 2.0 required minimum grade point average in the major is based upon all CEE major courses pursued as a part of the student's degree major.

## Railway Engineering Concentration

The Railway Engineering concentration provides a solid foundation in major sub-disciplines of civil engineering with an emphasis on railway engineering. This concentration leads to employment in both private and public sectors of industry. Examples of career opportunities include state and federal agencies, and small to large private engineering firms.

## Degree Requirements

## Junior Year - Fall Semester

CEE 341	Structural Analysis	3 cr.
CEE 351	Transportation Engineering	3 cr.
CEE 353	Transportation Engineering Laboratory	1 cr.
CEE 361	Engineering Fluid Mechanics	3 cr.
CEE 455	Railroad Transportation Engineering	3 cr.
xxx	Civil Engineering Science Elective	3 cr.

**Subtotal: 16**

## Junior Year - Spring Semester

CEE 330	Soil Mechanics	3 cr.
CEE 332	Soil Mechanics Laboratory	1 cr.
CEE 342	Steel & Reinforced Concrete	3 cr.
CEE 456	Railroad Track Structure Engineering	3 cr.
IE 212	Probability and Statistics	3 cr.
PH XXX	Ethical Perspective	3 cr.

**Subtotal: 16**

## Senior Year - Fall Semester

CEE 400	Ethical and Professional Issues	1 cr.
CEE 430	Geotechnical Engineering	3 cr.
CEE 461	Water Resources Engineering	3 cr.
CEE 470	Construction Engineering	3 cr.
xxx	Technical or Design Elective	3 cr.
CUL XXX	Cultural/Aesthetic Perspective	3 cr.

**Subtotal: 16**

## Senior Year - Spring Semester

CEE 320	Environmental Engineering	3 cr.
CEE 322	Environmental Engineering Laboratory	1 cr.
CEE 402	Capstone Design	3 cr.
CEE 451	Construction Materials	3 cr.
xxx	Technical or Design Elective	3 cr.

Subtotal: 61 **Subtotal: 13**

Total Credit Hours: 61

1. Technical or design electives are engineering, math, science, or computer courses normally numbered 300 or above and approved by the advisor.

2. General Education courses must be selected in such a way to insure all "perspectives of understanding" (p. 34) requirements have been satisfied.

3. Student selects one course from the list to satisfy the Civil Engineering Science Elective - GEOL 101, BIO 101, METR 101.

The 2.0 required minimum grade point average in the major is based upon all CEE major courses pursued as a part of the student's degree program.

### Reservoir Engineering Concentration

The Reservoir Engineering concentration is well suited for students planning on a career in reservoir engineering or water resources engineering.

### Degree Requirements

#### Junior Year - Spring Semester

CEE 324	Groundwater Engineering	3 cr.
CEE 330	Soil Mechanics	3 cr.
CEE 332	Soil Mechanics Laboratory	1 cr.
CEE 342	Steel & Reinforced Concrete	3 cr.
IE 212	Probability and Statistics	3 cr.
PH XXX	Ethical Perspective	3 cr.

**Subtotal: 16**

#### Senior Year - Fall Semester

CEE 400	Ethical and Professional Issues	1 cr.
CEE 411	Petroleum Fluids & Reservoir Engineering	3 cr.
CEE 430	Geotechnical Engineering	3 cr.
CEE 461	Water Resources Engineering	3 cr.
CEE 470	Construction Engineering	3 cr.
xxx	Technical or Design Elective	3 cr.

**Subtotal: 16**

#### Senior Year - Spring Semester

CEE 320	Environmental Engineering	3 cr.
CEE 322	Environmental Engineering Laboratory	1 cr.
CEE 402	Capstone Design	3 cr.
CEE 412	Petrophysics and Reservoir Geomechanics	3 cr.
xxx	Technical or Design Elective	3 cr.

**Subtotal: 13**

#### Junior Year - Fall Semester

CEE 341	Structural Analysis	3 cr.
CEE 351	Transportation Engineering	3 cr.
CEE 353	Transportation Engineering Laboratory	1 cr.
CEE 361	Engineering Fluid Mechanics	3 cr.
xxx	Civil Engineering Science Elective	3 cr.
CUL XXX	Cultural/Aesthetic Perspective	3 cr.

**Subtotal: 16**

Subtotal: 61

Total Credit Hours: 61

1. Technical or design electives are engineering, math, science, or computer courses normally numbered 300 or above and approved by the advisor.

2. General Education courses must be selected in such a way to insure all "perspectives of understanding" (p. 34) requirements have been satisfied.

3. Student selects one course from the list to satisfy the Civil Engineering Science Elective - GEOL 101, BIO 101, METR 101.

The 2.0 required minimum grade point average in the major is based upon all CEE major courses pursued as a part of the student's degree program.

### Construction Management

Professor: Kenneth Lee, Chair

### Construction Management Major

#### General information

Construction Management is defined as a professional service that uses specialized project management techniques to oversee the planning, design, and construction of a project from its beginning to its end. A Construction Manager provides a project's owner with effective management of the project's schedule, cost, quality, safety, scope, and function.

The College of Engineering's Construction Management major educates students to become leaders in this essential and in-demand profession. The Construction Management major provides students with a broad and well-integrated background in the concepts, theories, and methodologies needed to plan, design, analyze, develop, organize, and manage construction projects.

#### Career Opportunities

A Construction Management degree leads to employment in both private and public sectors of industry or military. Examples of career opportunities include city/county/state organizations, federal agencies, and small to large construction firms. The career outlook for construction managers is bright as the Bureau of Labor Statistics projects an employment growth rate of 10% over the decade of 2018-2028. Furthermore, *U.S. News & World Report* ranks construction managers as #1 in Best Construction Jobs with a low unemployment rate of 1.8%.

Construction Management Faculty (p. 128)

Electives

Electives supplement the student's technical program. These electives must be selected in such a way that all General Education "perspective of understanding" requirements are covered. In addition, technical, design, and general electives provide the opportunity for specialization within a chosen field. An assignment departmental faculty advisor must approve the selection of electives from engineering, mathematics, science, or business.

#### Vision

The vision of the Department of Construction Management is to be regionally, nationally, and internationally recognized in providing construction management education, leading to well-qualified managers who are innovative, immediate contributors to their profession, and successful in advanced studies.

#### Mission

The mission of the Construction Management program is to provide students with a supportive environment that facilitates learning to solve problems in construction management. The faculty and staff of the program use their background in teaching, research, and industry to prepare students to be successful as they move into the workforce or graduate school.

#### Educational Objectives

Our graduates will:

- Demonstrate a strong fundamental scientific and technical knowledge base and critical thinking skills.
- Actively engage in lifelong learning related to the construction management profession.
- Plan, design, analyze, develop, organize, and manage construction management projects.

#### Student Outcomes

Accordingly, the program has documented student outcomes that support the program educational objectives. Attainment of these outcomes prepares graduates to enter the professional practice of construction management.

- An ability to identify, formulate, and solve broadly defined technical or scientific problems by applying knowledge of mathematics and science and/or technical topics to areas relevant to construction management.
- An ability to formulate or design a system, process, procedure, or program to meet desired needs.
- An ability to develop and conduct experiments or test hypotheses, analyze and interpret data, and use scientific judgment to draw conclusions.
- An ability to communicate effectively with a range of audiences.
- An ability to understand ethical and professional responsibilities and the impact of technical and/or scientific solutions in global, economic, environmental, and societal contexts.
- An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty.

## Degree Requirements

### Freshman Year - Fall Semester

ENGR                      First Year Engineering Seminar                      1 cr.

102/HONE 102		
ENGR 103	Introduction to Engineering	4 cr.
MATH 109	Precalculus Mathematics	3 cr.
ENGL 132	English Composition I	3 cr.
CHEM 101	Modern Chemistry I	3 cr.
		<b>Subtotal: 14</b>

### Freshman Year - Spring Semester

ENGR 105/HONE 105	Computer Programming for Engineers	2 cr.
MATH 123	Calculus I for Management, Life, and Social Sciences	3 cr.
ENGL 133	English Composition II	3 cr.
CUL XXX	Cultural/Aesthetic Perspective	3 cr.
HIST XXX	History Perspective	3 cr.
		<b>Subtotal: 14</b>

### Sophomore Year - Fall Semester

CMGT 200	Construction CAD	3 cr.
CEE 251	Surveying	3 cr.
CEE 253	Surveying Laboratory	1 cr.
AC 101/HONB 203	Financial Reporting I	3 cr.
PHYS 133	Mechanics	4 cr.
EC 111	Principles of Microeconomics	3 cr.
		<b>Subtotal: 17</b>

### Sophomore Year - Spring Semester

CMGT 201	Construction Machinery	3 cr.
CEE 240	Strength of Civil Engineering Materials	3 cr.
CEE 242	Strength of Civil Engineering Laboratory	1 cr.
PH XXX	Ethical Perspective	3 cr.
CMGT 202/ME 202/HONE 202	Fundamentals of Statics	3 cr.
AC 202	Managerial Accounting	3 cr.
		<b>Subtotal: 16</b>

### Junior Year - Fall Semester

CMGT 300	Soil Behavior and Site Development	3 cr.
CMGT 302	Passive and Active Bldg Systems	3 cr.
CMGT 304	Construction Health and Safety, Risk Management	3 cr.
CEE 400	Ethical and Professional Issues	1 cr.
COMM 100	Principles of Communication	3 cr.
		or
COMM 233	Business Writing and Communication	3 cr.

MAN 204/HONB 204	Management and Organizational Behavior	3 cr.
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**Subtotal: 16**

junior Year - Spring Semester

CMGT 301	Analysis of Concrete, Steel, & Wood Structure	3 cr.
CMGT 303	Leadership and Human Resources Skills	1 cr.
CMGT 305	Construction Project Bidding & Cost Management	3 cr.
EC 112	Principles of Macroeconomics	3 cr.
MATH 121	Introductory Probability and Statistics	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 16**

Senior Year - Fall Semester

CMGT 400	Material Quality Control	3 cr.
CMGT 402	Material Quality Control Laboratory	1 cr.
CMGT 404	Computer Applications in Construction	3 cr.
CEE 470	Construction Engineering	3 cr.
CMGT 439/IE 439	Senior Design Projects I	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 16**

Senior Year - Spring Semester

CMGT 401	Capstone Design	3 cr.
CMGT 403	Construction Law, Contract, & Regulation	3 cr.
CEE 370	Architecture Engineering	3 cr.
IE 422	Industrial Safety and Hygiene	3 cr.
GEN XXX	General Elective	3 cr.

**Subtotal: 15**

Subtotal: 124

Electrical and Computer Engineering

## Electrical and Computer Engineering Majors

### General Information

Electrical and computer engineers are at the forefront of today's technological revolution and they continue to be in demand in all types of public and private enterprises. The value added in today's products is primarily in digital and analog electronics and software. The internet has filled our lives with their influences. Electrical and computer engineering touch every aspect of today's modern world, using Artificial Intelligence (AI) to make our lives better by making homes, automobiles, phones, speakers, and miscellaneous everyday devices smarter and exploiting the Internet of Things (IoT) to make the world more connected. Our graduates are uniquely qualified to become engineers, capable of designing hardware and software.

Electrical and computer engineers work in the communications, controls, signal and image processing, biomedical, aerospace, electronics, computer hardware, optics, integrated photonics, embedded systems, materials, energy, defense, data gathering/analysis, and other diverse commercial sectors.

The Electrical and Computer Engineering programs provide the student with a thorough background in electronic/hardware and systems design. Individual students can tailor their program to his or her specific interests by selecting appropriate technical or design electives. Elective areas include electronics, digital systems, IoT, VLSI, digital signal processing (DSP), controls, robotics, image optics, integrated photonics, and embedded systems. In all of our courses, we stress the balance of theory and practice. The theory, presented in class, is coupled with extensive, practical, hands-on laboratory projects and experiments.

Our laboratories are well equipped and all facilities are available for undergraduate use. Our laboratory equipment is updated on a rotating basis, allowing for a continued renewal and state-of-the-art technology in a rapidly changing world.

Electrical and Computer Engineering Laboratories:

- Embedded Systems Laboratory
- Controls and Artificial Intelligence Laboratory
- Internet of Things (IoT) Laboratory
- Circuits Laboratory
- Electronics Laboratory
- RF/Wireless Laboratory
- LEAP@WNE Optics/Photonics Laboratory
- Computer Architecture & Security Laboratory

Access is also provided to the following laboratories in other engineering departments as needed:

- Bioinstrumentation Laboratory
- Biomedical Engineering Physiology Laboratory
- Industrial Engineering Laboratory
- Mechanical Engineering Laboratory

Additionally, a fully equipped Machine Shop is available to students as well as a Rapid Prototyping STL machine.

The programs leading to the Bachelor of Science in Engineering (BSE) in Electrical and in Computer Engineering are accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

### Design Experience

Students in the Electrical Engineering program and Computer Engineering program are introduced to engineering design in the freshman year in the Introduction to Engineering courses. Sophomore and junior courses and labs provide progressively more sophisticated design experiences within the electrical engineering program and computer engineering program respectively. Both programs

culminate in a year-long capstone Senior Design Project course in which each student works on an independent project under the supervision of a faculty advisor. Most of the projects are sponsored by industry. Students involved in these projects have the opportunity to work with the industrial sponsor in an actual engineering environment.

### **Electives**

Electives, in both programs, supplement the engineering student's technical program. These electives must be selected in such a way that all General Education "perspective of understanding" requirements are covered. In addition, technical, design, and general electives provide the opportunity for specialization within a chosen field. An assigned departmental faculty advisor must approve selection of electives from engineering, mathematics, science, or business.

### **Electrical and Computer Engineering Faculty (p. 128)**

### **Electrical and Computer Engineering Vision and Mission**

#### ***Vision***

The Electrical and Computer Engineering programs at Western New England University will become nationally and internationally recognized for graduating students who have experienced putting theory into practice and are also capable of succeeding in advanced studies.

#### ***Mission***

The mission of the Electrical Engineering and Computer Engineering programs is to provide students with a supportive environment that facilitates learning to solve problems in electrical and computer engineering.

The Electrical and Computer Engineering programs are committed to excellence in student learning. Graduates of the programs will be problem solvers, able to apply engineering principles to electrical and computer systems. The faculty and staff of the programs use their background in teaching, research, and industry to prepare students to be successful as they move into the workforce or graduate school.

### **Program Educational Objectives**

In support of the objectives of the College of Engineering, the Electrical Engineering and Computer Engineering programs will prepare our students to be proficient at putting theory into practice, capable of lifelong learning, and be aware of the social, ethical, and environmental issues associated with their professional activities.

To ensure these goals, we expect specific accomplishments of our graduates to include the ability to:

1. successfully analyze, design, or test electrical/computer systems.
2. serve as a productive member of a team.
3. assume leadership roles in their career.
4. contribute in professional and civic service.

5. pursue lifelong learning.

### **Student Outcomes**

Accordingly, the program has documented student outcomes that support the program educational objectives. Attainment of these outcomes prepares graduates to enter the professional practice of engineering.

#### **Student Outcomes**

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

### **Career Opportunities**

The application areas for electrical and computer engineering are fairly ubiquitous and our Electrical and Computer Engineering programs provide a broad based education that leads to employment in a diverse spectrum of industries in both private and public sectors, for example, aerospace, defense, telecommunications, automotive, medical electronics, multimedia and consumer electronic industries, energy, and power. In particular we offer courses in electronic communications, robotics, artificial intelligence, controls, digital signal/image processing, digital design, computer architecture, software and hardware design, embedded systems, optics, and integrated photonics.

To provide additional depth in some of these areas the department offers Program Sequence Options as listed below.

- Robotics/Mechatronics Sequence
- RF/Microwave Engineering Sequence
- Controls/Artificial Intelligence Sequence
- Optics and Integrated Photonics Sequence

These Sequence Options have been described in detail following the Electrical Engineering program and Computer Engineering program degree requirements.

### Degree Requirements

#### Freshman Year- Fall Semester

ENGL 132	English Composition I	3 cr.
ENGR 102/HONE 102	First Year Engineering Seminar	1 cr.
ENGR 103	Introduction to Engineering	4 cr.
MATH 133	Calculus I	4 cr.
PHYS 133	Mechanics	4 cr.

**Subtotal: 16**

#### Freshman Year - Spring Semester

ENGL 133	English Composition II	3 cr.
ENGR 105/HONE 105	Computer Programming for Engineers	2 cr.
ENGR 110/HONE 110	Data Acquisition and Processing	3 cr.
MATH 134	Calculus II	4 cr.
PHYS 134	Electricity and Magnetism	4 cr.

**Subtotal: 16**

#### Sophomore Year - Fall Semester

CHEM 105	General Chemistry I	4 cr.
EE 205/HONE 205	Electrical Engineering I	4 cr.
ME 202/HONE 202	Statics	3 cr.
MATH 236	Differential Equations	3 cr.
SBP XXX	Social/Behavioral Perspective	3 cr.

**Subtotal: 17**

Subtotal: 49

Total Credit Hours: 49

### Electrical Engineering Program

Graduates of the Electrical Engineering program have the ability to apply their knowledge and skills in a variety of professional electrical engineering positions dealing with research, design, manufacturing, and operation of equipment and services including power, control, communication, computer, optical and electro-optical systems, consumer electronics, household appliances, and electrical and electronic devices and materials. They can also apply for advanced graduate studies.

### Degree Requirements

#### Sophomore Year - Spring Semester

CPE 271	Digital System Design	4 cr.
EE 206	Electrical Engineering II	4 cr.

EE 212	Fundamentals of Electro-Optics	3 cr.
EE 285	Computational Techniques in C	3 cr.
MATH 235	Calculus III	3 cr.

**Subtotal: 17**

#### Junior Year - Fall Semester

IE 212	Probability and Statistics	3 cr.
EE 301	Signals and Systems	3 cr.
EE 303	Electronic Circuits	3 cr.
EE 314	Electromagnetic Fields and Waves	3 cr.
EE 319	Electrical Engineering Laboratory I	2 cr.

CUL XXX	Global Cultures Perspective	3 cr.
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**Subtotal: 17**

#### Junior Year - Spring Semester

EE 302	Introduction to Digital Signal Processing	3 cr.
xxx	Design Elective	3 cr.
EE 320	Analog Integrated Circuits	3 cr.
EE 322	Electrical Engineering Laboratory II	2 cr.

xxx	Design Elective	3 cr.
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HIST XXX	Historical Perspective	3 cr.
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**Subtotal: 17**

#### Senior Year - Fall Semester

EE 422	Control Systems	3 cr.
EE 427	Electrical Engineering Laboratory III	2 cr.
EE 436	Project Research, Innovation and Development	2 cr.
EE 439	Professional Awareness	1 cr.
xxx	Design Elective	3 cr.
xxx	Technical Elective	3 cr.

**Subtotal: 14**

#### Senior Year - Spring Semester

EE 440	Senior Design Projects	3 cr.
GEN XXX	General Elective	3 cr.
xxx	Technical Elective	3 cr.
xxx	Design Elective	3 cr.
PH XXX	Ethical Perspective	3 cr.

**Subtotal: 15**

1. Technical electives are engineering, math, science, or computer courses normally numbered 300 or above and approved by the advisor.



- General Education courses must be selected in such a way to insure that all “perspective of understanding” requirements have been satisfied.
- Design electives are EE or CPE courses numbered 300 or above and approved by the advisor.
- General elective. Selected on approval of the academic advisor.

Subtotal: 80

Total Credit Hours: 80

The 2.0 required minimum grade point average in the major is based upon all CPE and EE courses pursued as a part of the student’s degree program.

## Computer Engineering Program

Graduates of the Computer Engineering program have the ability to apply their knowledge and skills in a variety of professional engineering positions dealing with research, design, manufacturing, operation, and service of small or large computer hardware, software, and embedded systems. They can also apply for advanced graduate studies.

### Degree Requirements

#### Sophomore Year - Spring Semester

CPE 271	Digital System Design	4 cr.
EE 206	Electrical Engineering II	4 cr.
EE 285	Computational Techniques in C	3 cr.
MATH 235	Calculus III	3 cr.
PH XXX	Ethical Perspective	3 cr.

**Subtotal: 17**

#### Junior Year - Fall Semester

IE 212	Probability and Statistics	3 cr.
CPE 310	Microprocessors I	3 cr.
EE 301	Signals and Systems	3 cr.
EE 303	Electronic Circuits	3 cr.
CPE 305	Data Structures for Embedded Firmware Design	3 cr.
EE 319	Electrical Engineering Laboratory I	2 cr.

**Subtotal: 17**

#### Junior Year - Spring Semester

CPE 323	Embedded Systems Laboratory	1 cr.
CPE 355	Real Time Embedded Kernels	3 cr.
CPE 360	Microprocessors II	4 cr.
EE 302	Introduction to Digital Signal Processing	3 cr.
CPE 462/CPE 562	VHDL: Simulation and Synthesis	3 cr.
CUL XXX	Global Cultures Perspective	3 cr.

**Subtotal: 17**

#### Senior Year - Fall Semester

CPE 420/CPE 520	Computer Architecture	3 cr.
CPE 422/CPE 522	Internet of Things (IoT)	3 cr.
CPE 427	Computer Engineering Laboratory	2 cr.
CPE 436	Project Research, Innovation and Development	2 cr.
CPE 439	Professional Awareness	1 cr.
xxx	CPE Design Elective	3 cr.

**Subtotal: 14**

#### Senior Year - Spring Semester

CPE 470	Real-time Embedded Controls	3 cr.
CPE 440	Senior Design Projects	3 cr.
GEN XXX	General Elective	3 cr.
xxx	CPE Technical Elective	3 cr.
HIST XXX	History Perspective	3 cr.

**Subtotal: 15**

- General Education courses must be selected in such a way to insure that all “perspective of understanding (p. 34)” requirements have been satisfied.
- CPE Design electives are CPE courses numbered 300 or above and approved by the advisor.
- General elective. Selected on approval of the academic advisor.

Subtotal: 80

Total Credit Hours: 80

The 2.0 required minimum grade point average in the major is based upon all CPE and EE major courses pursued as a part of the student’s degree program.

### Program Sequence Options

There are several program sequence options within the Electrical Engineering and Computer Engineering programs as listed below.

- Robotics/Mechatronics Sequence
- Modern Controls/Artificial Intelligence Sequence
- RF/Microwave Engineering Sequence
- Optics and Integrated Photonics Sequence

The student can select a sequence option by appropriately tailoring their choice of electives during their junior and senior years. Each sequence option has been described below, along with a list of typical courses used to provide the required depth in the area. These lists are by no means exhaustive; the student makes his or her selection of sequence electives in consultation with their faculty advisor.

#### *Robotics/Mechatronics Sequence*

Robotics/Mechatronics represents an integrated technology approach for the design of intelligent systems and products. Intelligent systems driven primarily by human operator inputs are considered mechatronic systems; smart washing machines would be a good example. Intelligent systems driven primarily by automatic/sensor

and adaptive inputs are robotic systems; the Google Driverless car would be a good example. The Robotics/Mechatronics sequence is intended for students who want to focus in this area while working on their Bachelor of Science in Engineering (BSE) in Electrical Engineering degree. Students in the Electrical Engineering or Computer Engineering programs can elect to take this sequence by an appropriate selection of technical electives during their junior and senior years and completing their senior project in this area.

The sequence electives provide coverage of the following topics:

- embedded programming and computing
- sensors and actuators
- adaptive control and environmental interactions
- computer vision and navigation

Typical courses:

EE 302 Introduction to Digital Signal Processing

CPE 360 Microprocessors II

EE 422 Control Systems

CPE 470 Real-time Embedded Controls

CPE 462 VHDL—Simulation and Systems

### ***RF/Microwave Engineering Sequence***

RF/Microwave Engineering Sequence represents an integrated technology approach for the design of high frequency systems and products. The students in the RF/Microwave Engineering Sequence are exposed to different aspects of applied electromagnetics including antennas design, the design of high frequency passive and active circuits, the design high frequency systems, etc. This sequence is designed to meet the growing needs of companies for engineers skilled in high frequency circuit design. The RF/Microwave Engineering Sequence is intended for students who want to focus in this area while working on their BSE in Electrical Engineering degree. Students in the Electrical Engineering program can elect to take this sequence by an appropriate selection of technical electives during their junior and senior years and completing their senior project in this area.

The sequence electives provide coverage of the following topics:

- Fields and Waves
- Microwave Engineering
- RF & Microwave Wireless Systems
- RF & Microwave Active Circuit Design
- Wave Transmission and Reception
- Software Defined Radio

Typical courses:

EE 314 Fields and Waves

EE 414 Microwave Engineering

EE 416 Electromagnetic Compatibility

EE 455 RF and Microwave Wireless Systems

EE 456 RF and Microwave Active Circuit Design

EE 457 Wave Transmission and Reception

### ***Modern Controls and Artificial Intelligence Sequence***

Modern Control Theory

Utilizing state-space analysis, where the dynamics of the processes are described by first-order differential equations in matrix form, has made an enormous impact on the analysis and design of controllers for complex systems. In recent years, modern control theory has advanced rapidly and is now recognized as an indispensable and practical technique for the design and analysis of feedback control systems in diverse areas such as aeronautics, robotics, autonomous vehicles, space craft systems design, etc.

Artificial Intelligence

The field of artificial intelligence or soft-computing utilizes Neural Networks, Deep Learning, Machine Learning, and Fuzzy Logic. In recent years, there has been an explosive growth in applications of neural networks and deep learning, in part due to the advances in computational power. Neural networks, neurocomputing, or 'brain-like' computing is based on the hope that we can reproduce at least some of the flexibility and power of the human brain by artificial means. Self-driving (Autonomous) vehicles are one example of applied neural networks. Similarly, Fuzzy Logic tries to mimic the human cognitive processes. Applications of these technologies abound in many consumer products such as camcorders, air conditioners, refrigerators, automobiles etc. These technologies are applied in a variety of fields such as; signal processing, speech recognition, visual perception, control, robotics/mechatronics, and many more. Smart phones, Alexa ©, Siri ©, driverless cars, smart homes, etc. are all examples of applied artificial intelligence.

Our Controls and Artificial Intelligence sequence will give students expertise in the areas of industrial automation, robotics, mechatronics, aerospace/aeronautics control systems, and artificial intelligence.

The sequence electives provide coverage of the following topics:

- Linear Systems Theory
- Fuzzy Logic
- Neural Networks, Deep Learning/Machine Learning
- Computer Controlled Systems
- embedded programming and computing
- sensors and actuators
- adaptive control and environmental interactions
- computer vision and navigation

Typical courses:

EE422 Control Systems

EE445 Neural Networks

EE470 Computer Controlled Systems

EE435 Fuzzy Logic

EE425 Linear Systems Theory

CPE320 Microprocessors I

CPE470 Real-time Embedded Controls

CPE462 VHDL—Simulation and Systems

### ***Optics and Integrated Photonics Sequence***

The Optics and Integrated Photonics Sequence enables students to pursue educational opportunities in the emerging technology areas of

optics and integrated photonics. The students are exposed to different aspects applied optics and photonics including the design of free space optical systems, the design of integrated silicon photonics passive and active circuits, and the design of laser systems with applications in medical technology or light detection and ranging (LiDAR). Many of the courses offered in the sequence utilize the LEAP@WNE optics/photonics laboratory space, which is comprised of over \$2.5M of equipment funded by the Massachusetts Manufacturing Innovation Initiative (M2I2) that adds WNE to the established national ecosystem dedicated to global manufacturing leadership in integrated optics/photonics. The sequence is designed to meet the growing needs of companies for engineering skilled in optics/photonics design. The Optics and Integrated Photonics Sequence is intended for students who want to focus in this area while working on their BSE in Electrical Engineering degree. Students in the Electrical Engineering program can elect to take this sequence by an appropriate selection of technical electives during their junior and senior years and completing their senior project in this area.

The sequence electives provide coverage of the following topics:

- Optics
- Integrated Photonics
- Electro-Optics
- Quantum Optics
- Fields and Waves

Typical courses:

EE 212 Fundamentals of Electro-Optics  
 EE 314 Fields and Waves  
 EE 448 Silicon Photonics  
 EE 449 Optical Engineering  
 EE 457 Wave Transmission and Reception

### Five-Year Bachelor/Master of Science in Engineering in Electrical Engineering Program

This program allows undergraduate Electrical Engineering and Computer Engineering majors in the College of Engineering to accelerate the completion of the Bachelor of Science in Engineering (BSE) in Electrical Engineering and to earn the Master of Science in Engineering (MSE) in Electrical Engineering/Computer Engineering with just one additional year of study.

### Five-Year Bachelor/MBA Program

This program allows undergraduate Electrical and Computer Engineering majors in the College of Engineering to accelerate the completion of the Bachelor of Science in Engineering (BSE) in Electrical Engineering and to earn the master's degree in Business Administration (MBA) with just one additional year of study.

### Five-Year Bachelor/Master of Science in Engineering Management Program

This program allows undergraduate Electrical and Computer Engineering majors in the College of Engineering to accelerate the completion of the bachelor's degree in Engineering and to earn the Master of Science (MS) in Engineering Management with just one additional year of study.

## Industrial Engineering

### Industrial Engineering Major

#### General Information

The Industrial Engineering curriculum prepares engineers to design, improve, install, and operate integrated systems of people, materials, and equipment needed by industry, commerce, and society. Industrial engineers prevent anticipated problems as well as solve current problems by applying the principles of engineering science, operations research, computer science, work analysis, product and process design and planning, human factors, quality assurance, and management. The curriculum is designed to provide strength in mathematics, basic science, and engineering science plus a carefully coordinated set of courses that are particularly relevant to the professional industrial engineer.

While providing Industrial Engineering students with a theoretical base, the IE program also emphasizes practical application of engineering principles to real problems and products. The program provides intensive laboratory and hands-on project work sponsored by local companies each year. Students obtain significant hands-on project experience before they graduate.

The program leading to the BSE degree is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

#### Career Opportunities

Upon completion, students are prepared to pursue a wide variety of professional opportunities in industrial, commercial, and public service enterprises. The curriculum provides an excellent background for advanced study in industrial engineering, operations research, computer science, engineering management, business administration, law, and other fields.

#### Industrial Engineering Faculty (p. 128) (p. 128)

The Department of Industrial Engineering and Engineering Management's primary goal is to effectively teach industrial engineering at the undergraduate level and engineering management at the graduate level. The department is guided by our Advisory Board which consists of alumni, faculty from other Industrial Engineering programs, and working professionals from local, regional, and national companies. We are proud of our students who continue to be successful, sought-after individuals who constantly serve as ambassadors for our program. Industrial Engineering (IE) at Western New England University will be a regional and national leader in communicating engineering knowledge and innovation associated with designing, operating, and improving processes for producing and delivering products and services. Industrial Engineering will educate the utilization of resources, including people, equipment, capital, materials, information, and energy. This will be accomplished by the use of classroom and laboratory instruction supplemented by repeated exposure to actual industrial projects in "learning beyond the classroom" opportunities.

#### Program Mission

As a strategic partner in alliance with the mission of the University, we strive to educate engineers who have the ability to help their organizations make the most effective use of resources, including people, equipment, capital, materials, information, and energy. Our graduates will enable their organization to be productive, flexible, and customer oriented. They will apply engineering skills to design effective systems and to devise procedures with which to operate these systems. And, they will continuously strive to improve both

themselves through continuous education, and their organizations through avoidance and elimination of harmful or wasteful practices. Specifically, IE seeks to:

1. educate engineers who will be successful in their professional careers;
2. educate engineers who understand the metrics of an organization and what it takes to be a successful member of that organization;
3. provide selected research and services to industry and government to meet their specific needs;
4. contribute to the advancement of the IE profession through faculty leadership; and
5. enhance the overall reputation of the College of Engineering and Western New England University.

**Educational Objectives**

The Educational Objectives of the Industrial Engineering program describe the expected achievements of graduates several years after graduation. Graduates of the BSE program will achieve the following:

1. successful application of contemporary tools, knowledge, experience, and critical thinking to effectively solve engineering problems;
2. implementation of effective solutions which successfully integrate people, materials, information, equipment, capital, and energy;
3. effective collaboration and communication in individual and team settings;
4. contribute as well-informed, ethical, and dependable members of society; and
5. continually increase their knowledge and experience throughout their career.

**Student Outcomes**

Accordingly, the program has documented student outcomes that support the program educational objectives. Attainment of these outcomes prepares graduates to enter the professional practice of engineering.

Student Outcomes

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

**Degree Requirements**

Freshman Year - Fall Semester

ENGL 132	English Composition I	3 cr.
ENGR 102/HONE 102	First Year Engineering Seminar	1 cr.
ENGR 103	Introduction to Engineering	4 cr.
MATH 133	Calculus I	4 cr.
PHYS 133	Mechanics	4 cr.

**Subtotal: 16**

Freshman Year - Spring Semester

ENGL 133	English Composition II	3 cr.
ENGR 105/HONE 105	Computer Programming for Engineers	2 cr.
ENGR 110/HONE 110	Data Acquisition and Processing	3 cr.
MATH 134	Calculus II	4 cr.
PHYS 134	Electricity and Magnetism	4 cr.

**Subtotal: 16**

Sophomore Year - Fall Semester

CHEM 105	General Chemistry I	4 cr.
ME 202/HONE 202	Statics	3 cr.
EE 205/HONE 205	Electrical Engineering I	4 cr.
MATH 236	Differential Equations	3 cr.
SBP XXX	Social/Behavioral Perspective	3 cr.

**Subtotal: 17**

Sophomore Year - Spring Semester

AC 101/HONB 203	Financial Reporting I	3 cr.
IE 212	Probability and Statistics	3 cr.
MATH 235	Calculus III	3 cr.
xxx	Mathematics or Basic Science Elective	3 cr.
PH XXX	Ethical Perspective	3 cr.

**Subtotal: 15**

Junior Year - Fall Semester

IE 308	Work Analysis and Design	3 cr.
IE 312	Engineering Economic Analysis	3 cr.
IE 318	Mathematical Programming for	3 cr.

	Engineers	
IE 326	Production Planning and Control	3 cr.
IE 419	Python Programming and Machine Learning for Industrial Management	3 cr.
CUL XXX	Global Cultures Perspective	3 cr.
		<b>Subtotal: 18</b>

#### Junior Year - Spring Semester

IE 314/ME 322	Manufacturing Processes	3 cr.
IE 315	Quality Control and Engineering Statistics	3 cr.
IE 328	Lean Six-Sigma for Engineers	3 cr.
IE 334	Computer Simulation and Design	3 cr.
IE 330	Manufacturing & Production Lab	2 cr.
HIST XXX	Historical Perspective	3 cr.
		<b>Subtotal: 17</b>

#### Senior Year - Fall Semester

IE 429	Design and Analysis of Experiments	3 cr.
IE 428	Facility Design & Material Handling	2 cr.
IE 439	Senior Design Projects I	3 cr.
xxx	Technical or Design Elective	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 14</b>

#### Senior Year - Spring Semester

IE 420	Industrial Engineering Operations Research	3 cr.
IE 440	Senior Design Projects II	3 cr.
xxx	Technical Elective	3 cr.
xxx	Design Elective	3 cr.
IE 460	Supply Chain Engineering	3 cr.
		<b>Subtotal: 15</b>

1. General Education courses must be selected in such a way to insure that all "perspective of understanding (p. 34)" requirements have been satisfied.
  2. Mathematics or Basic Science Electives are biological, chemical, or physical sciences courses or mathematics course 300 level or above.
  3. Technical or design electives are engineering, math, or science courses normally numbered 300 or above or courses approved by the department chair.
  4. General Elective. Selected on approval of the academic advisor.
- Subtotal: 128

Total Credit Hours: 128

The 2.0 required minimum grade point average in the major is based upon all IE major courses pursued as a part of the student's degree program. In addition, a minimum grade of C is required in IE 440.

## Five-Year Bachelor/Master of Science in Engineering Management Program

This program allows undergraduate Industrial Engineering majors in the College of Engineering to accelerate the completion of the Bachelor of Science in Engineering (BSE) in Industrial Engineering and to earn the Master of Science (MS) in Engineering Management with just one additional year of study.

## Five-Year Bachelor/MBA Program

This program allows undergraduate Industrial Engineering majors in the College of Engineering to accelerate the completion of the Bachelor of Science in Engineering (BSE) in Industrial Engineering and to earn the master's degree in Business Administration (MBA) with just one additional year of study.

### Mechanical Engineering

## Mechanical Engineering Major

### General Information

Mechanical engineering is one of the broadest and most diverse of the engineering disciplines and affects all aspects of our lives. It involves the application of science and technology essential to industry, government, environment, and society. Mechanical engineers design, analyze, build, test, and control mechanical devices and systems. They are involved in the design and development of automobiles, airplanes, satellites, robots, power plants, machine tools, material handling systems, medical devices and instrumentation, communications equipment, semiconductor devices, heating and air-conditioning systems, consumer products, and alternative energy systems. Mechanical engineers contribute on interdisciplinary teams to work in emerging areas such as advanced manufacturing processes, mechatronics, nanotechnology and green engineering technology. Mechanical engineering is generally recognized as the engineering discipline that offers the broadest choice of technical career directions.

The Mechanical Engineering curriculum provides a thorough background in thermal and mechanical systems and mechanical design. By selecting an appropriate group of technical and design electives, a student can concentrate in either thermal and fluid science or mechanical design. Thermal and fluid science electives include courses related to energy conversion, aerodynamics, introduction to flight, and turbomachinery design. Mechanical design electives include courses in stress analysis and computer-aided design, material selection, and metrology. The coursework is coupled with extensive practical hands-on experience in modern well-equipped laboratories. The use of computers to aid in engineering analysis and design is emphasized throughout the curriculum.

Students can choose to study either the broad areas of thermal-fluid sciences or mechanical design or select Mechatronics Engineering Concentration that is a blend of mechanical and electrical engineering. A Green Engineering Sequence of elective courses is also available with courses in renewable energy, alternative energy systems, and green engineering. The program leading to the BSE degree is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

### Career Opportunities

Mechanical engineers are employed in all types of industry and government. They work in research, product development, product design, manufacturing, consulting, and sales. Our graduates are employed at Allston Power, UTC Aerospace Systems, Disney, FloDesign, Goodrich, Northrup Grumman, Pratt and Whitney, United

Technologies Research Center, General Dynamics, Boeing, Lockheed-Martin, Otis, Carrier, Hasbro-Bradley, General Motors, NASA, Electric Boat, Andersen Consulting, General Electric, Smith and Wesson, American Saw, Northeast Utilities, Rolls Royce, Areva, Gerber Scientific Research, Spalding Sports Worldwide, Sikorsky, Westinghouse, BAE systems, and many others. Mechanical Engineering graduates have also become physicians and patent attorneys. Mechanical engineers occupy executive positions in many large corporations and others have gone on to become entrepreneurs and founded their own companies.

**Design Experience**

Students are introduced to engineering design in the freshman year; sophomore, junior, and senior courses provide progressively more sophisticated design experiences within the student’s discipline. All programs are culminated by a capstone Senior Design Project course in which a student works on an independent project under the supervision of a faculty advisor. A majority of the projects involve a collaboration with an industry partner. A student who selects one of these topics has the opportunity to work with the industrial sponsor in an actual engineering experience.

**Electives**

Electives supplement the engineering student’s technical program. These electives must be selected in such a way that all General Education “perspective of understanding” requirements are covered. In addition, technical, design, and general electives provide the opportunity for specialization within a chosen field. The student’s departmental faculty advisor must approve the selection of electives from engineering, mathematics, science, or business.

**Mission**

The mission of the Department of Mechanical Engineering is to educate, prepare, inspire, and mentor students to excel as professionals and to grow throughout their careers in the art, science and responsibilities of engineering. This is accomplished by:

- Providing the facilities and environment conducive to a high quality education, well grounding the students in the fundamental principles of engineering, and preparing them for diverse careers;
- Engaging in academic and scholarly activities, which strengthen the major’s regional, national, and international reputation.

**Vision**

The vision of the Department of Mechanical Engineering is to be regionally, nationally, and internationally recognized in providing mechanical engineering education, leading to well qualified engineers who are innovative, immediate contributors to their profession, and successful in advanced studies.

**Educational Objectives**

The objectives of the Mechanical Engineering Program are to produce graduates whose careers and professional behavior several years after graduation are marked by:

- A commitment to continuing education and technical competency in solving engineering problems, consistent with the ethics of the profession, and serving the needs of local, national, and multinational communities and enterprises;

- Advancement in their professional careers, including the attainment of increased technical or managerial capabilities; and
- Continual improvement in effective technical and non-technical communication and teamwork.

**Student Outcomes**

Accordingly, the program has documented student outcomes that support the program educational objectives. Attainment of these outcomes prepares graduates to enter the professional practice of engineering.

Student Outcomes

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

**Mechanical Engineering Faculty (p. 128)**

**Degree Requirements**

Freshman Year - Fall Semester

ENGL 132	English Composition I	3 cr.
ENGR 102/HONE 102	First Year Engineering Seminar	1 cr.
ENGR 103	Introduction to Engineering	4 cr.
MATH 133	Calculus I	4 cr.
PHYS 133	Mechanics	4 cr.

**Subtotal: 16**

Freshman Year - Spring Semester

ENGL 133	English Composition II	3 cr.
ENGR 105/HONE 105	Computer Programming for Engineers	2 cr.
ENGR 110/HONE 110	Data Acquisition and Processing	3 cr.

MATH 134	Calculus II	4 cr.
PHYS 134	Electricity and Magnetism	4 cr.
		<b>Subtotal: 16</b>

## Sophomore Year - Fall Semester

CHEM 105	General Chemistry I	4 cr.
EE 205/HONE 205	Electrical Engineering I	4 cr.
MATH 236	Differential Equations	3 cr.
ME 202/HONE 202	Statics	3 cr.
SBP XXX	Social/Behavioral Perspective	3 cr.
		<b>Subtotal: 17</b>

## Sophomore Year - Spring Semester

IE 212	Probability and Statistics	3 cr.
MATH 235	Calculus III	3 cr.
ME 203	Dynamics	3 cr.
ME 205	Measurement Computing	2 cr.
ME 208	Mechanics of Materials	3 cr.
PH XXX	Ethical Perspective	3 cr.
		<b>Subtotal: 17</b>

Subtotal: 66

Total Credit Hours: 66

## Mechanical Engineering Course of Study

## Degree Requirements

## Junior Year - Fall Semester

MATH 350	Vector Calculus and Fourier Series	3 cr.
ME 303	Thermodynamics I	3 cr.
ME 309	Materials Science	3 cr.
ME 311	Mechatronics	3 cr.
ME 313	Mechanical Laboratory I	2 cr.
CUL XXX	Cultural/Aesthetic Perspective	3 cr.
		<b>Subtotal: 17</b>

## Junior Year - Spring Semester

ME 304	Thermodynamics II	3 cr.
ME 314	Mechanical Laboratory II	2 cr.
ME 316	Fluid Mechanics	3 cr.
ME 320	Mechanical Vibrations	3 cr.
xxx	Engineering/Science Elective	3 cr.
HIST XXX	Historical Perspective	3 cr.
		<b>Subtotal: 17</b>

## Senior Year - Fall Semester

ME 417	Heat Transfer	3 cr.
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ME 425	Design of Machine Elements	3 cr.
ME 423/BME 423/BUS 423	Product Development and Innovation	3 cr.
ME 439	Professional Awareness	1 cr.
ME 449	Computer-Aided Engineering	3 cr.
GEN XXX	General Elective	3 cr.
		<b>Subtotal: 16</b>

## Senior Year - Spring Semester

IE 312	Engineering Economic Analysis	3 cr.
ME 440	Senior Design Projects	3 cr.
xxx	Design Elective	3 cr.
xxx	Engineering Elective	3 cr.
		<b>Subtotal: 12</b>

Subtotal: 62

Total Credit Hours: 62

1. *General Education courses must be selected in such a way to insure that all "perspectives of understanding" requirements have been satisfied.*
2. *An engineering, math, or science course usually numbered 300 or above selected from a list published by the Mechanical Engineering Department and approved by the faculty advisor.*
3. *A design elective is selected from a list published in each semester's course schedule.*
4. *An engineering course usually numbered 300 or above and approved by the faculty advisor.*
5. *General Elective selected on approval of the academic advisor.*

The 2.0 required minimum grade point average in the major is based upon all ME major courses pursued in the student's degree program.

## Green Engineering Sequence Courses

As the growth of the world's populations and economies puts an ever increasing strain on the social and physical environment, today's engineers are faced with developing solutions that use renewable energy sources, reduce waste energy, minimize the impact on the environment, reduce poverty in the world, and provide prosperity for all.

In the junior year, a student may choose electives in the general mechanical engineering course of study, or specialize with electives in Green Engineering.

Green elective courses are designed to satisfy the need for mechanical engineers with a knowledge of (1) renewable energy sources such as wind, water, solar, and geothermal energy, (2) power generation, distribution, and management, (3) energy management, and (4) principles of green engineering.

## Green Courses

In the Junior and Senior years, there are green engineering courses that can be selected to satisfy mechanical engineering program elective requirements, as well as, a required mechanical engineering project based course in which a green engineering component can be included.

Junior Year-Senior Year

ME 318	Design of Solar Energy Systems	3 cr.
ME 415	Wind/Water Turbine Fundamentals	3 cr.
ME 423/BME 423/BUS 423	Product Development and Innovation	3 cr.
ME 440	Senior Design Projects	3 cr.
ME 445	Design of Alternative Energy Systems	3 cr.
EE 336	Electrical Energy Systems	3 cr.
EE 338	Electric Drives	3 cr.

**Mechatronics Concentration**

Mechatronics is a modern discipline that transcends the boundaries between Mechanical, Electrical, and Computer Engineering. It is defined as the science of intelligent systems in which engineers integrate mechanical, electrical, and computer engineering to design, develop, fabricate, and test smart systems that learn over time and become more intelligent. The evolution of this area is particularly a consequence of the tremendous growth in the area of Computers, intelligent sensors and Electronic controllers

Recent rapid growth of mechatronics as an area of engineering has given rise to a significant demand for mechatronics engineers. In the Department of Mechanical Engineering at Western New England, our Mechatronics Concentration is helping meet this need by producing engineering graduates who are capable, well-rounded mechatronics designers and system integrators.

In the junior year, a student may choose to remain in the general Mechanical Engineering course of study or specialize with a concentration in Mechatronics and Systems Integration. The Mechatronics Concentration is designed to satisfy the need for mechanical engineers with a thorough knowledge of (1) transducers, smart sensors, and signal conditioners, (2) Modeling, Analysis, and Control Techniques, (3) Pneumatic, Electric, hydraulic, and smart actuators incorporating integrated controls, (4) Database management using SQL language (5) Design of Human Machine Interface (HMI), (6) PLC and Embedded Controllers.

**Degree Requirements**

**Junior Year - Fall Semester**

MATH 350	Vector Calculus and Fourier Series	3 cr.
ME 303	Thermodynamics I	3 cr.
ME 309	Materials Science	3 cr.
ME 311	Mechatronics	3 cr.
ME 313	Mechanical Laboratory I	2 cr.
CUL XXX	Global Cultures Perspective	3 cr.

**Subtotal: 17**

**Junior Year - Spring Semester**

EE 336	Electrical Energy Systems	3 cr.
ME 314	Mechanical Laboratory II	2 cr.
ME 316	Fluid Mechanics	3 cr.

ME 320	Mechanical Vibrations	3 cr.
ME 324	Design of Mechatronic Systems	3 cr.
HIST XXX	Historical Perspective	3 cr.

**Subtotal: 17**

**Senior Year - Fall Semester**

ME 417	Heat Transfer	3 cr.
ME 423/BME 423/BUS 423	Product Development and Innovation	3 cr.
ME 425	Design of Machine Elements	3 cr.
ME 427	Kinematics and Control of Electro-Mechanical Systems	3 cr.
ME 439	Professional Awareness	1 cr.
ME 455/ME 656	Applications of Mechatronic Systems	3 cr.

**Subtotal: 16**

**Senior Year - Spring Semester**

IE 312	Engineering Economic Analysis	3 cr.
ME 440	Senior Design Projects	3 cr.
xxx	Engineering Design Elective	3 cr.
ME 449	Computer-Aided Engineering	3 cr.

**Subtotal: 12**

1. General Education courses must be selected in such a way to insure that all "perspectives of understanding (p. 34)" (p. 34) requirements have been satisfied.
2. An engineering design elective, usually numbered 3xx or above, selected from a list published by the Department of Mechanical Engineering and approved by the faculty advisor.
3. Select a Senior Design Project topic that contains a mechatronic related component approved by the Department of Mechanical Engineering.

Subtotal: 62

Total Credit Hours: 62

The 2.0 required minimum grade point average in the major is based on all ME and Mechatronics major courses pursued in the student's degree program.

**Five-Year Bachelor/Master of Science in Mechanical Engineering Program**

This program allows undergraduate Mechanical Engineering majors in the College of Engineering to accelerate the completion of the Bachelor of Science in Engineering (BSE) in Mechanical Engineering and to earn the Master of Science in Engineering (MSE) degree in Mechanical Engineering with just one additional year of study.

**Five-Year Bachelor/MBA Program**

This program allows undergraduate Mechanical Engineering majors in the College of Engineering to accelerate the completion of the Bachelor of Science in Engineering (BSE) in Mechanical Engineering and to earn the master's degree in Business Administration (MBA) with just one additional year of study.



### **Five-Year Bachelor/Master of Science in Engineering Management Program**

This program allows undergraduate Mechanical Engineering majors in the College of Engineering to accelerate the completion of the Bachelor of Science in Engineering (BSE) in Mechanical Engineering and to earn the Master of Science (MS) in Engineering Management with just one additional year of study.

## College of Pharmacy and Health Sciences

Dean John Pezzuto

Senior Associate Dean for Academic Affairs Beth Welch

Assistant Dean for Student Affairs Amy Burton

The Western New England University College of Pharmacy and Health Sciences will be prominently known for excellence in the preparation of professional practitioners as educators of patients and other healthcare professionals and leaders for the betterment of patient care. The College of Pharmacy and Health Sciences began the professional phase of the pharmacy program in fall 2011.

Pharmacy Studies

### Pharmacy Studies Major

#### *General Information*

The Pharmacy Studies curriculum prepares students for pharmacy-related careers and enables a strong foundation in the biomedical, pharmaceutical, administrative/social/ behavioral, and clinical sciences required in pharmacy. In addition, the curriculum prepares students for other health-related fields, as well as graduate programs in biomedical or pharmaceutical sciences.

#### *Career Opportunities*

Students who receive an undergraduate degree in Pharmacy Studies typically continue their studies at the doctoral level in Pharmacy (PharmD) or other advanced degrees in health-related professions or biomedical/pharmaceutical sciences. Graduates with this undergraduate degree may directly enter careers as pharmacy technicians or other pharmaceutical fields.

#### *Program Outcomes:*

The competent graduate can obtain, understand, analyze, evaluate, and synthesize information in order to problem-solve and make informed, rational, and responsible decisions.

The competent graduate will have an awareness and understanding of the differences present in a pluralistic society in order to work effectively and collaboratively to produce better outcomes.

The competent graduate understands their role as a member of the civic and professional community, taking steps to actively contribute and lead to produce betterments.

The competent graduate recognizes the ethical and legal dimensions of pharmacy practice and health policy and makes decisions and actions based on integrity, responsibility, compassion, empathy, and respect.

The competent graduate listens attentively and communicates clearly, utilizing situation appropriate verbal, nonverbal, and written methods, with patients, caregivers, families, and healthcare team members.

The competent graduate has a solid foundation of scientific knowledge and is able to apply basic science in the practice of pharmacy, especially with regard to safe medication usage.

The competent graduate assists in providing patient-centered care in collaboration with a pharmacist and other interprofessional healthcare providers as well as the patient and their caregivers in order to produce optimal medication therapy outcomes.

The competent graduate assists in the provision of population-based care as part of an interprofessional collaboration. The competent graduate assists in the implementation of population-specific programs and protocols.

The competent graduate uses health care resources, including dispensing systems, under the supervision of a pharmacist and in cooperation with patients, health care providers, and administrative and support personnel, with the goal of improving patient outcomes.

The healthcare resources a graduate may use include: human, physical, medical, informational, and technological resources as well as medical use systems.

The competent graduate assists in the promotion of good health and disease prevention in cooperation with patients, communities, at-risk populations, and other healthcare professionals for the public welfare.

The competent graduate has the ability to actively participate as a healthcare team member to assist in the provision of patient care and population care. The graduate demonstrates mutual respect and understanding and values the roles of the healthcare team in the provision of patient care.

#### *Program of Study*

The College of Pharmacy and Health Sciences recognizes a curriculum leading to the degree of Bachelor of Science in Pharmacy Studies.

This degree opportunity allows those who have completed their pre-professional coursework at Western New England University to earn an undergraduate degree after 4 years of study.

#### *Minors*

The course work for a degree may include one or more of the minors offered by the University. A minor may not be completed in the same discipline as the major. Descriptions of the requirements for the minors (p. 156) are listed. Students wishing to take a minor must complete a form in the Office of the Dean, College of Arts and Sciences, no later than the beginning of the final semester.

### **General University and College Requirements**

See General University Requirements (p. 33)

### **College of Pharmacy and Health Sciences Degree Requirements**

Undergraduate students in the College of Pharmacy and Health Sciences are required to satisfy the General University Requirements (p. 33). All students within the College of Pharmacy and Health Sciences applying for the Bachelor of Science in Pharmacy Studies must also fulfill the following requirements:

1. Completion of 125 credit hours, with 82 of the required

credit hours completed at Western New England University.

2. Completion of 50 credit hours, earning final course grades of “C” or “P” or higher in all required courses in the first and second professional year of the Doctor of Pharmacy program at Western New England College of Pharmacy and Health Sciences.

3. Completion of an additional 8 credit hours of elective coursework earning final course grades of “C-” or “P” or higher in the first and second professional year of the Doctor of Pharmacy program at Western New England College of Pharmacy and Health Sciences.

#### Required Pre-Professional and Suggested Sequence of Courses (67 credit hours)

##### Freshman Year - Fall Semester

PSY 101	Introduction to Psychology	3 cr.
CHEM 105	General Chemistry I	4 cr.
BIO 107	General Biology I	3 cr.
BIO 117	General Biology Laboratory I	1 cr.
MATH 123	Calculus I for Management, Life, and Social Sciences	3 cr.
ENGL 132	English Composition I	3 cr.

**Subtotal: 17**

##### Freshman Year - Spring Semester

COMM 102	Introduction to Public Speaking	3 cr.
CHEM 106	General Chemistry II	4 cr.
BIO 108	General Biology II	3 cr.
BIO 118	General Biology Laboratory II	1 cr.
MATH 120	Intro Statistics for the Arts & Sciences	3 cr.
	or	
MATH 121	Introductory Probability and Statistics	3 cr.
ENGL 133	English Composition II	3 cr.

**Subtotal: 17**

##### Sophomore Year - Fall Semester

PHYS 123	Physics of the Life Sciences I	4 cr.
PH 208	Ethics	3 cr.
CHEM 209	Organic Chemistry I	3 cr.
CHEM 219	Organic Chemistry Laboratory I	1 cr.
BIO 215	Anatomy and Physiology I	4 cr.

**Subtotal: 15**

##### Sophomore Year - Spring Semester

EC 111	Principles of Microeconomics	3 cr.
BIO 203	Microbiology	4 cr.
CHEM 210	Organic Chemistry II	3 cr.
CHEM 220	Organic Chemistry Laboratory II	1 cr.
BIO 216	Anatomy and Physiology II	4 cr.

HIST xxx	History Elective	3 cr.
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**Subtotal: 18**

Subtotal: 67

## Degree Requirements

### Required Coursework

Offered within the first and second professional years of the Doctor of Pharmacy program and suggested sequence (50 credit hours)

#### First Professional Year—Fall Semester

PHAR 510	Intro to Pharmacy	1 cr
PHAR 511	Drug Information & Informatics	2 cr
PHAR 512	Immunology	3 cr
PHAR 513	Biochemistry	3 cr
PHAR 514	Pharmaceutics I	2 cr
PHAR 516	Pharmacy Ethics	3 cr.
PHAR 518	Pharmaceutical Calculations	2 cr

**Subtotal: 16**

#### First Professional Year—Spring Semester

PHAR 522	Pathophysiology	3 cr
PHAR 523	Genetics & Genomics	2 cr
PHAR 524	Pharmaceutics II	2 cr
PHAR 525	Pharmaceutics II Lab	1 cr
PHAR 526	Pharmacy Outcomes	2 cr.
PHAR 527	Self Care Therapeutics	3 cr
PHAR 528	Intro to Pharmacy & Health Prof II	1 cr
PHAR 540	IPPE Health Services	2 cr
	or	
PHAR 541	IPPE Community	2 cr

**Subtotal: 16**

#### Second Professional Year—Fall Semester

PHAR 610	Principles of Pharmacokinetics	4 cr
PHAR 611	Principles of Pharmacology	3 cr
PHAR 612	Principles of Medicinal Chemistry	3 cr
PHAR 614	Patient Assessment Skills Lab	1 cr
PHAR 615	Professional Pharmacy Practice Lab	1 cr
PHAR 642	IPPE Community	2 cr
	or	
PHAR 643	IPPE Health System	2 cr

**Subtotal: 14**

#### Second Professional Year—Spring Semester

PHAR 627	Sterile Products Lab	1 cr
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PHAR 628	Drug Lit Eval & Evidence-Based Practice	3 cr
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**Subtotal: 4**

Elective Coursework during the First and/or Second Professional Year (8 credits)

CUL XXX	Cultural/Aesthetic Perspective	3 cr.
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PHAREL xxx	Pharmacy Electives	5 cr.
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**Subtotal: 8**

Subtotal: 58

Total Credit Hours: 125

## DESCRIPTIONS OF MINOR PROGRAMS

### Minors

In addition to the academic major, which all students must take, students have the option of electing a minor.

To elect a minor or to obtain further information, students should consult the office of the dean of the College of Business for the following minors:

Accounting  
 Business  
 Enterprise Resource Planning with SAP  
 Entrepreneurship  
 Finance  
 Human Resource Management  
 Integrated Marketing Communications  
 International Business  
 Marketing  
 Management

— Students may contact the office of the dean of the College of Arts and Sciences for all other minors

### Requirements

A student must successfully complete all courses specified for the minor and attain a minimum cumulative GPA of 2.00 in the minor.

Additionally, a minimum of two courses, with a minimum of six credits, of the minor must be completed at WNE.

### Accounting Minor

#### Degree Requirements

The minor requirement is 18 credit hours, as follows:

AC 101/HONB 203	Financial Reporting I	3 cr.
AC 202	Managerial Accounting	3 cr.
AC 2XX-4XX	Elective	3 cr.
AC 3XX-4XX	Elective	3 cr.

**Subtotal: 12**

Plus two of the following electives:

AC 3XX-4XX	Elective	3 cr.
AC 3XX-4XX	Elective	3 cr.
FIN 3XX-4XX	Elective	3 cr.
BL 640	Business Law	3 cr.

**Subtotal: 6**

The Accounting Minor is not available to Accounting majors.

Students make take a limited number of graduate courses toward undergraduate minor, in accordance with current policy.

Subtotal: 18

Total Credit Hours: 18

### African American Studies Minor

#### Degree Requirements

The minor requirement is 18 credit hours. Three courses from following are required:

ENGL 223	African American Literature I	3 cr.
ENGL 224	African American Literature II	3 cr.
CUL 255	African American and Caribbean Cultures	3 cr.

**Subtotal: 9**

(Other electives at the discretion of the director)

And three courses from the following:

ENGL 336	Ethnic American Literature	3 cr.
ENGL 341	Caribbean Writers	3 cr.
ENGL 343	Literature of Africa and the African Diaspora	3 cr.
ENGL 345	Major African American Writers	3 cr.
COMM 326	Race, Gender, and Ethnicity in the Media	3 cr.
SO 211	Race and Ethnicity	3 cr.

**Subtotal: 9**

Subtotal: 18

Total Credit Hours: 18

### Art Minor

The minor requirement is 18 credit hours in Art. At least nine credit hours in studio art and six credit hours in Art History/Appreciation.

### Athletic Coaching Minor

#### Degree Requirements

The minor requirement is 18 credit hours, as follows:

The athletic coaching minor is offered through the School of Arts and Sciences and is directly administered through the Physical Education program. The minor is interdisciplinary in nature and draws from courses in physical education, psychology, and sport management. The minor provides a cohesive and meaningful academic program for students wishing to pursue the formal study of athletic coaching.

PEHR 201	Principles and Practices of Successful Coaching	3 cr.
PEHR 202	Care and Prevention of Athletic Injury/Sport First Aid	3 cr.
PSY 201	Developmental Psychology	3 cr.
PSY 321	Sports Psychology	3 cr.
PSY 313	Learning	3 cr.

or

SPMN 450	Managing Collegiate/Scholastic Athletic Programs	3 cr.
PEHR 480	Internship in Athletic Coaching	3 cr.
	or	
PEHR 481	Internship in Athletic Coaching	3 cr.

**Subtotal: 18**

Subtotal: 18

Total Credit Hours: 18

### Biology Minor

#### Degree Requirements

The minor requirement is 18 credit hours, as follows:

BIO 107	General Biology I	3 cr.
BIO 117	General Biology Laboratory I	1 cr.
BIO 108	General Biology II	3 cr.
BIO 118	General Biology Laboratory II	1 cr.
BIO 201	Plant Biology	4 cr.
BIO 213	Ecology	3 cr.
BIO 15X	Natural Science Perspective in Biology	3 crs.

**Subtotal: 18**

Note: the BIO 15X requirement can be fulfilled with any BIO 15X or higher level BIO course.

BIO 213 has CHEM 105 as a pre-/co-requisite.

Subtotal: 18

Total Credit Hours: 18

### Bio-Medical Physics Minor

The requirements for a minor in Bio-Medical Physics are 20 credit hours as follows:

#### Degree Requirements

Required PHYS courses 11 credits

PHYS 123	Physics of the Life Sciences I	4 cr.
PHYS 124	Physics of the Life Sciences II	4 cr.
	or	
PHYS 133	Mechanics	4 cr.
PHYS 134	Electricity and Magnetism	4 cr.
	And	
PHYS 320	Modern Physics	3cr.

**Subtotal: 11**

Additional courses 9 credit hours from following

PHYS 301	Optics	3cr.
PHYS 3XX	PHYS 3xx Elective	3 cr.
PHYS 3XX	PHYS 3xx Elective	3 cr.
	or	

PHYS 390	Special Topics	1-3 cr.
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**Subtotal: 9**

6 credit hours of the Additional courses 9 credit hours can be substituted from following

BME 332	Biomedical Imaging	3 cr.
	or	
BME 450	Biotransport Processes	3 cr.
	or	
BME 451	Biomechanics II	3 cr.

Subtotal: 20

Total Credit Hours: 20

### Business Minor

#### Degree Requirements

The minor requirement is 18 credit hours, as follows:

AC 101/HONB 203	Financial Reporting I	3 cr.
AC 202	Managerial Accounting	3 cr.
BIS 202	Introduction to Business Information Systems	3 cr.
FIN 214	Introduction to Finance	3 cr.
MAN 204/HONB 204	Management and Organizational Behavior	3 cr.
MK 200/HONB 200	Principles of Marketing	3 cr.

**Subtotal: 18**

The business minor is not available to students whose major is within the College of Business.

Subtotal: 18

Total Credit Hours: 18

### Chemistry Minor

#### Degree Requirements

The minor requirement is 20 credit hours, as follows:

CHEM 105	General Chemistry I	4 cr.
CHEM 106	General Chemistry II	4 cr.

**Subtotal: 8**

Plus any one of the following lecture and lab combinations:

CHEM 211	Analytical Methods	3 cr.
CHEM 221	Analytical Methods Laboratory	1 cr.
	or	
CHEM 314	Biochemistry	3 cr.
CHEM 324	Biochemistry Laboratory	1 cr.

**Subtotal: 4**

Plus either set of the two lectures - two laboratory course sequences listed below:

CHEM 209	Organic Chemistry I	3 cr.
CHEM 219	Organic Chemistry Laboratory I	1 cr.
CHEM 210	Organic Chemistry II	3 cr.
CHEM 220	Organic Chemistry Laboratory II	1 cr.
	or	
CHEM 317	Physical Chemistry I	3 cr.
CHEM 327	Physical Chemistry Laboratory I	1 cr.
CHEM 318	Physical Chemistry II	3 cr.
CHEM 328	Physical Chemistry Laboratory II	1 cr.
		<b>Subtotal: 8</b>

Subtotal: 20

Total Credit Hours: 20

This minor is not open to Forensic Chemistry majors.

The chemistry minor is open only to students who have completed one semester of college-level physics (PHYS 101 or PHYS 103 or PHYS 123 or PHYS 132 or PHYS 133) and one of the following mathematics courses: MATH 109, MATH 123, or MATH 133.

Note: CHEM 314/CHEM 324 requires the organic chemistry sequence as prerequisites. The physical chemistry two lecture - two laboratory course sequence requires CHEM 211/CHEM 221 as a prerequisite.

Note: The number of available seats in upper-level chemistry courses is very limited, and we recommend advanced planning and advising.

## Communication Minor

### Degree Requirements

The minor requirement is 18 credit hours, as follows:

COMM 100	Principles of Communication	3 cr.
	or	
COMM 233	Business Writing and Communication	3 cr.
COMM 102	Introduction to Public Speaking	3 cr.
COMM 320	Small Group Communication	3 cr.
COMM 340	Business Communication	3 cr.
		<b>Subtotal: 12</b>

Plus any two of the following courses:

JRNL 100	Journalism: Practices and Principles	3 cr.
COMM 205	Mass Communication	3 cr.
COMM 245	Video Editing and Production	4 cr.
COMM 283	Health Communication	3 cr.
COMM 285	Introduction to Public Relations	3 cr.
COMM 315	Rhetoric of Social Justice Movements	3 cr.

COMM 321	Interpersonal Communication	3 cr.
COMM 324	Media Industries, Government, and Society	3 cr.
COMM 326	Race, Gender, and Ethnicity in the Media	3 cr.
COMM 348	Intercultural Communication	3 cr.
COMM 356	Global Communication	3 cr.

**Subtotal: 6**

Subtotal: 18

Total Credit Hours: 18

## Computer Forensics Minor

### General Information

The rate of computer crime is increasing at a phenomenal rate and is receiving heightened attention by businesses and the media. There is a corresponding need for computing professionals who are also trained in the field of criminal justice.

This minor provides students with a combination of criminal justice and computing skills to enable them to investigate computer crimes. The requirements for a minor in Computer Forensics are 19 credit hours as follows:

### Degree Requirements

Required CS/IT courses (9-10 credit hours)

CS 101/IT 101	Introduction to Computing	4 cr.
	or	
CS 132	Principles of Computing	3 cr.
	And	
CS 300	Digital Forensics I	3 cr.
CS 310	Digital Forensics II	3 cr.
		<b>Subtotal: 9-10</b>

Required CJ courses (9 credit hours)

CJ 101	Introduction to Criminal Justice	3 cr.
CJ 311	Criminal Investigation	3 cr.
CJ 348	Introduction to Cyber Crimes	3 cr.
		<b>Subtotal: 9</b>

Total Credit Hours: 18-19

## Computer Science Minor

### Degree Requirements

The minor requirement is 22 credit hours, as follows:

CS 101/IT 101	Introduction to Computing	4 cr.
CS 102/IT 102	Introduction to Programming	4 cr.
	or	
CS 171	Programming for Mathematics	4 cr.
CS 200/IT 200	Data Structures	4 cr.
CS 210	Software Design	4 cr.

MATH 251	Advanced Discrete Mathematics	3 cr.
	or	
MATH 281	Foundations of Mathematics I	3 cr.
CS 32x-4xx	Computer Science Elective	3 cr.
	or	
MATH 363	Theory of Computation	3 cr.
		<b>Subtotal: 22</b>

Subtotal: 22

Total Credit Hours: 22

### Creative Writing Minor

#### Degree Requirements

The minor requirement is 18 credit hours, as follows:

ENGL 237	Creative Writing	3 cr.
ENGL 351	Fiction Workshop	3 cr.
ENGL 352	Poetry Workshop	3 cr.
ENGL 354	Creative Non-Fiction Workshop	3 cr.
ENGL 3xx	Creative Writing Electives (Variable-Topics)	3 cr.
ENGL 3XX/4XX	Creative Writing/English Elective	3 cr.
		<b>Subtotal: 18</b>

Please note:

With the exception of ENGL 237, the Creative Writing workshops may be taken more than once for credit toward the minor.

Creative Writing electives : ENGL 270, ENGL 290-ENGL 299, ENGL 351, ENGL 352, ENGL 354, ENGL 370 and ENGL 390-ENGL 399.

Subtotal: 18

Total Credit Hours: 18

### Criminal Justice Minor

#### Degree Requirements

The minor requirement is 18 credit hours, as follows:

A student must take CJ 101 prior to taking the remaining courses:

CJ 101	Introduction to Criminal Justice	3 cr.
CJ 211	Corrections	3 cr.
	or	
CJ 218	Police and Society	3 cr.
	or	
CJ 234	The Judicial Process	3 cr.
CJ XXX	Criminal Justice Elective	3 cr.
CJ XXX	Criminal Justice Elective	3 cr.

CJ XXX	Criminal Justice Elective	3 cr.
CJ XXX	Criminal Justice Elective	3 cr.
		<b>Subtotal: 18</b>

Subtotal: 18

Total Credit Hours: 18

### Cybersecurity Minor

#### Degree Requirements

The minor requirement is 23 credit hours, as follows:

IT 101/CS 101	Introduction to Computing	4 cr.
IT 102/CS 102	Introduction to Programming	4 cr.
IT 230	Introduction to Operating Systems and Script Development	3 cr.
IT 250/BIS 413	Data Communications and Networks	3 cr.
IT 330	Fundamentals of Cybersecurity	3 cr.
IT 430	Ethical Hacking	3 cr.
IT 435	Cybersecurity Operations	3 cr.
		<b>Subtotal: 23</b>

Subtotal: 23

Total Credit Hours: 23

### Digital Publishing Minor

The Digital Publishing minor is intended to provide students with an interdisciplinary understanding of contemporary practices of publishing in an online world. The minor is designed so that students have a foundation in aesthetics of layout and design, writing, and programming, and understand the changing dynamics of the digital publishing industry. In the course of their studies, students will build a portfolio of professional work, learn about online publishing platforms that can spotlight their talents, and work toward creating an online student-run publishing hub.

#### Degree Requirements

The minor requirement is 18 credit hours, as follows:

ENGL 270	Writing for the Web	3 cr.
IT 240	Foundations of Web Systems	3 cr.
JRNL 100	Journalism: Practices and Principles	3 cr.
		<b>Subtotal: 9</b>

Plus any two of the following (6 cr);

COMM 324	Media Industries, Government, and Society	3 cr.
COMM 352	Multimedia Communication	3 cr.
COMM 360/JRNL 360	Sportswriting	3 cr.
COMM 371/JRNL 370	Advanced Radio Reporting	3 cr.
ENGL 370	Writing about TV and Film	3 cr.



ENGL 371	Narrative and Digital Media	3 cr.
IT 350	Web Systems Development	3 cr.
IT 450	Advanced Topics in Web Design and Development	3 cr.
JRNL 303	Contemporary Journalism	3 cr.

**Subtotal: 6**

Plus any one of the following (3 cr)

ART 130	Color in Art & Design	3 cr.
COMM 260	Communication Web Design	3 cr.
COMM 285	Introduction to Public Relations	3 cr.
ENGL 240	Editing	3 cr.

**Subtotal: 3**

Subtotal: 18

Total Credit Hours: 18

**Economics Minor****Degree Requirements**

The minor requirement is 18 credit hours, as follows:

EC 111	Principles of Microeconomics	3 cr.
EC 112	Principles of Macroeconomics	3 cr.
EC 215	Intermediate Macroeconomics	3 cr.
	or	
EC 311	Money and Banking	3 cr.
EC 216	Intermediate Microeconomics	3 cr.
	or	

**Subtotal: 12**

Plus six additional credits at 200 level or higher - three credits of which could be:

Subtotal: 18

Total Credit Hours: 18

**Education Minor****Degree Requirements**

The minor requirement is 18 credit hours, as follows.

PSY 101	Introduction to Psychology	3 cr.
ED 201	Principles and Problems of Education	3 cr.
ED 365	Special Education: Principles & Practices	3 cr.

**Subtotal: 9**

Plus any three of the following education or psychology courses:

ED 333	Independent Study in Education	1-3 cr.
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ED 350	Reading and Language Arts: Theory and Methods	3 cr.
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ED 275	Teaching English Language Learners	3 cr.
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ED 375	Humanities, Science and Mathematics Methods	3 cr.
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PSY 201	Developmental Psychology	3 cr.
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PSY 304	Educational Psychology	3 cr.
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PSY 307	Psychological Assessment	3 cr.
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PSY 313	Learning	3 cr.
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PSY 317	Psychology of the Exceptional Person	3 cr.
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PSY 322	School Psychology	3 cr.
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**Subtotal: 9**

Subtotal: 18

Total Credit Hours: 18

**English Minor****Degree Requirements**

The minor requirement is 18 credit hours, as follows:

ENGL 231	British Literature I	3 cr.
	or	

ENGL 232	British Literature II	3 cr.
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ENGL 251	American Literature I	3 cr.
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ENGL 314	Shakespeare: Plays and Poems	3 cr.
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	or	
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ENGL 315	Shakespeare: The Tragedies	3 cr.
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	or	
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ENGL 316	Shakespeare: The Comedies and Histories	3 cr.
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	or	
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ENGL 338/411	Major Authors	3 cr.
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	or	
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ENGL 345	Major African American Writers	3 cr.
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ENGL 3XX/4XX	English Elective	3 cr.
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ENGL 3XX/4XX	English Elective	3 cr.
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ENGL 3XX/4XX	English Elective	3 cr.
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**Subtotal: 18**

Subtotal: 18

Total Credit Hours: 18

### Enterprise Resource Planning with SAP Minor

#### Degree Requirements

The minor requirement is 21 credit hours as follows:

BIS 202	Introduction to Business Information Systems	3 cr.
BIS 221	Statistics for Business Analytics	3 cr.
BIS 312	Quality and Operations Management with SAP	3 cr.
BUS 312/HONB 312	Business Processes and Enterprise Resource Planning with SAP	3 cr.
BIS 412	Business Analytics with SAP	3 cr.
MAN 370	Project Management	3 cr.
BIS 340	Enterprise Resource Planning Systems	3 cr.

**Subtotal: 21**

Subtotal: 21

Total Credit Hours: 21

### Entertainment Management Minor

#### Degree Requirements

The minor requirement is 18 credit hours, as follows:

AEM 250	Introduction to Arts & Entertainment Organizations	3 cr.
BL 308	Labor Management Relations	3 cr.
	or	
BL 388	Labor Management Relations in Sport	3 cr.
AEM 355	Arts and Entertainment Venue Operations	3 cr.
	or	
SPMN 355	Sport Facility Planning and Management	3 cr.
EC 350	Economics of Arts and Entertainment	3 cr.
	or	
BL 403	Business Law for Entrepreneurs	3 cr.
COMM 344	Event Planning	3 cr.
MK 372	Digital Media Marketing Strategies	3 cr.

**Subtotal: 18**

Subtotal: 18

Total Credit Hours: 18

### Entrepreneurship Minor

#### Degree Requirements

The minor requirement is 15 credits hours, as follows:

Required Courses (9 credits):

ENTR 251	Entrepreneurship and Innovation	3 cr.
BUS 423/BME 423/ME 423	Product Development and Innovation	3 cr.
ENTR 480	Internship in Entrepreneurship	3 cr.

**Subtotal: 9**

Choose two of the following Elective Courses (6 credits):

FIN 330	Financing Entrepreneurial Ventures	3 cr.
MK 302	Market Analysis	3 cr.
MK 372	Digital Media Marketing Strategies	3 cr.

**Subtotal: 6**

Subtotal: 15

Total Credit Hours: 15

Not available to students majoring in Entrepreneurship.

### Film Studies Minor

#### Degree Requirements

The minor requirement is 18 credit hours as follows:

The following two courses are required:

FILM 102	The History of Film	3 cr.
FILM 103	The Art of Film	3 cr.

**Subtotal: 6**

To fulfill the minor, students must take four courses from the following:

FILM 201	Studies in Mainstream Film Genres	3 cr.
FILM 202	The Haunted Screen	3 cr.
FILM 210	Mass Media in Film	3 cr.
FILM 290	Special Topics in Film	1-3 cr.
FILM 304	Science Fiction Film	3 cr.
FILM 312	International Cinema	3 cr.
FILM 320	Introduction to Cinema Production	3 cr.
FILM 340	Director's Signature	3 cr.
FILM 370	Women and Film	3 cr.
FILM 390 - 393	Special Topics in Film	1-3 cr.

**Subtotal: 12**

Subtotal: 18

Total Credit Hours: 18

**Finance Minor****Degree Requirements**

The minor requirement is 18 credit hours, as follows:

FIN 214	Introduction to Finance	3 cr.
FIN 317	Investments	3 cr.
FIN 320	Intermediate Corporate Finance	3 cr.

**Subtotal: 9**

Plus 9 credits of FIN course electives:

FIN 3XX-4XX	FIN Electives	9 cr.
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**Subtotal: 9**

The Finance minor is not available to Finance majors.

Subtotal: 18

Total Credit Hours: 18

**Forensic Science Minor****Degree Requirements**

The minor requirement is 30 credit hours as follows:

BIO 107	General Biology I	3 cr.
BIO 117	General Biology Laboratory I	1 cr.
CHEM 105	General Chemistry I	4 cr.
CHEM 106	General Chemistry II	4 cr.
CHEM 209	Organic Chemistry I	3 cr.
CHEM 210	Organic Chemistry II	3 cr.
CHEM 219	Organic Chemistry Laboratory I	1 cr.
CHEM 220	Organic Chemistry Laboratory II	1 cr.
CJ 101	Introduction to Criminal Justice	3 cr.
FS 240	Scientific Evidence	3 cr.
FS 201	Introduction to Forensics	4 cr.

**Subtotal: 30**

Note: This minor is not open to Forensic Chemistry or Forensic Biology majors.

Subtotal: 30

Total Credit Hours: 30

**Health Sciences Minor****Degree Requirements**

The minor requirement is 22 credit hours, as follows:

BIO 107	General Biology I	3 cr.
BIO 117	General Biology Laboratory I	1 cr.
BIO 108	General Biology II	3 cr.
BIO 118	General Biology Laboratory II	1 cr.
BIO 215	Anatomy and Physiology I	4 cr.
BIO 216	Anatomy and Physiology II	4 cr.
HS 2XX	HS Elective	3 cr.

HS 2XX	HS Elective	3 cr.
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**Subtotal: 22**

Additional courses that fulfill the HS elective requirements: BIO 203, BIO 310, BIO 312, BIO 320, NSCI 248, NSCI 348

Note: This minor is not open to Health Sciences and Health Studies majors.

BIO 215 has CHEM 106 as a prerequisite.

Subtotal: 22

Total Credit Hours: 22

**History Minor****Degree Requirements**

History Minor requirements:

Six HIST courses (18 credits)

At least two HIST courses (6 credits) at 300-level or above

No more than two HIST courses (6 credits) at the 100-level

Total Credit Hours: 18

**Human Resource Management Minor****Degree Requirements**

The minor requirement is 18 credit hours - as follows:

HRM 323	Human Resource Management	3 cr.
BL 308	Labor Management Relations	3 cr.
	or	
BL 388	Labor Management Relations in Sport	3 cr.
BL 424	Business Law for Human Resource Management	3 cr.

**Subtotal: 9**

Plus nine credits of HRM 3xx/4xx courses

HRM 3XX/4XX	Human Resource Management Elective	3 cr.
HRM 3XX/4XX	Human Resource Management Elective	3 cr.
HRM 3XX/4XX	Human Resource Management Elective	3 cr.

**Subtotal: 9**

The Human Resource Management minor is not available to Management & Leadership majors, Sport Management majors, or Human Resource majors.

Subtotal: 18

Total Credit Hours: 18

**Information Technology Minor - Suspended 2022-2023**

**Subtotal: 16**

**Degree Requirements**

The minor requirement is 19 credit hours, as follows:

Required IT courses (13 credit hours)

IT 102/CS 102	Introduction to Programming	4 cr.
IT 230	Introduction to Operating Systems and Script Development	3 cr.
IT 250/BIS 413	Data Communications and Networks	3 cr.
	And	
IT 300/BIS 321	Database Management Systems	3 cr.
	or	
CS 364	Design of Database Management Systems	3 cr.

**Subtotal: 13**

In addition to the required above four courses, students must complete two courses from the following courses.

IT 310	System Operation and Administration	3 cr.
IT 330	Fundamentals of Cybersecurity	3 cr.
IT 350	Web Systems Development	3 cr.
IT 360	Network Management and Operations	3 cr.
IT 410	Advanced Topics in System Administration	3 cr.
IT 430	Ethical Hacking	3 cr.
IT 450	Advanced Topics in Web Design and Development	3 cr.
IT 460	Advanced Topics in Network Administration	3 cr.

**Subtotal: 6**

IT 350 and IT 450: These two courses have additional prerequisites of CS 102/IT 102 and IT 240.

Subtotal: 19

Total Credit Hours: 19

**Integrated Marketing Communication (IMC) Minor**

**Degree Requirements**

The minor requirement is 16 credit hours as follows:

COMM 245	Video Editing and Production	4 cr.
MK 200/HONB 200	Principles of Marketing	3 cr.
MK 302	Market Analysis	3 cr.
MK 303	Customer Solutions	3 cr.
MK 372	Digital Media Marketing Strategies	3 cr.

Subtotal: 16

Total Credit Hours: 16

The IMC minor is not available to students majoring in Marketing or Marketing Communication/Advertising.

**International Business Minor**

**Degree Requirements**

The minor requirement is 18 credit hours - as follows:

INTB 251	Introduction to International Business	3 cr.
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**Subtotal: 3**

Plus two of the following

FIN 322	International Finance	3 cr.
MAN 311	International Management	3 cr.
MK 311	Multinational Marketing	3 cr.

**Subtotal: 6**

Plus nine credits of the following:

Plus nine credits focused on Culture, Communication, Economics, Foreign Language, International Studies Political Science, or other.

Past examples include

CUL 315/BUS 315, International Practicum;  
 COMM 348, Intercultural Communication;  
 EC 371, International Monetary Economics;  
 EC 372, International Trade;  
 POSC 203, International Relations;  
 and  
 POSC 340/LSOC 340, International Governance and Law.

CUL 315/BUS 315	International Practicum	3 cr.
COMM 348	Intercultural Communication	3 cr.
EC 371	International Monetary Economics	3 cr.
EC 372	International Trade	3 cr.
POSC 203	International Relations	3 cr.
POSC 340/LSOC 340	International Governance and Law	3 cr.

**Subtotal: 9**

Subtotal: 15

Total Credit Hours: 18

**International Studies Minor**

**Degree Requirements**

The minor requirement consists of seven courses (21 credit hours), as follows:

GEOG 102	World Regional Geography I: Highly Developed Countries	3 cr.
	or	
GEOG 103	World Regional Geography II: Less Developed Countries	3 cr.
	And	
HIST 206	World History, 1500CE-Present	3 cr.
	or	
INST 101/POSC 101	Introduction to Contemporary Global Issues	3 cr.
	And	
POSC 203	International Relations	3 cr.
		<b>Subtotal: 9</b>

Plus any one course from the International Studies  
Curriculum list Group B or foreign language

**Subtotal: 3**

Plus any three courses from the International Studies  
Curriculum list Group C or foreign language

**Subtotal: 9**

Subtotal: 21

Total Credit Hours: 21

### Journalism Minor

#### Degree Requirements

The minor requirement is 19 credit hours as follows:

JRNL 100	Journalism: Practices and Principles	3 cr.
JRNL 303	Contemporary Journalism	3 cr.
COMM 205	Mass Communication	3 cr.
COMM 245	Video Editing and Production	4 cr.
		<b>Subtotal: 13</b>

Plus any two 300-level or higher JRNL courses

JRNL 360/COMM 360	Sportswriting	3 cr.
JRNL 362	Entertainment Journalism	3 cr.
JRNL 370/COMM 371	Advanced Radio Reporting	3 cr.
		<b>Subtotal: 6</b>

Subtotal: 19

Total Credit Hours: 19

### Latin American Studies Minor

#### Degree Requirements

The minor requirement is 18 credit hours, as follows:

SPAN 101	Elementary Spanish I	3 cr.
	And	
SPAN 102	Elementary Spanish II	3 cr.

	or	
SPAN 203	Intermediate Spanish I	3 cr.
	And	
SPAN 204	Intermediate Spanish II	3 cr.
CUL 250	Latin American Civilization	3 cr.
HIST 170	Colonial Latin American History	3 cr.
	or	
HIST 171	Modern Latin American History	3 cr.
SO 211	Race and Ethnicity	3 cr.
	or	
SO 326	Sociology of Culture	3 cr.

**Subtotal: 18**

Subtotal: 18

Total Credit Hours: 18

A demonstrated proficiency in Spanish or Portuguese may allow one to waive certain language requirements and to add courses in Latin American government or history. These would require the approval of the dean.

### Management Minor

#### Degree Requirements

The minor requirement is 18 credit hours as follows:

Required courses (nine credit hours):

MAN 204/HONB 204	Management and Organizational Behavior	3 cr.
MAN 303	Interpersonal Skills for Leading	3 cr.
HRM 323	Human Resource Management	3 cr.
		<b>Subtotal: 9</b>

Plus nine credit hours of MAN 3xx/4xx courses

MAN 3XX/4XX	Management Courses	9 cr.
		<b>Subtotal: 9</b>

Total Credit Hours: 18

The Management minor is not available to students who are majoring in Management and Leadership, Sport Management, or Human Resource Management.

### Marketing Minor

#### Degree Requirements

The minor requirement is 18 credit hours as follows:

MK 200/HONB 200	Principles of Marketing	3 cr.
MK 302	Market Analysis	3 cr.
MK 303	Customer Solutions	3 cr.
MK 3XX/4XX	Marketing Elective	3 cr.
MK 3XX/4XX	Marketing Elective	3 cr.
	And	

BUS 423/BME 423/ME 423	Product Development and Innovation	3 cr.
	or	
MK 3XX/4XX	Marketing Elective	3 cr.
		<b>Subtotal: 18</b>

Subtotal: 18

Total Credit Hours: 18

The minor is not available to students majoring in Marketing or Marketing Communication/Advertising.

### Mathematical Sciences Minor

#### Degree Requirements

The minor requirement is 18 or 20 credit hours, as follows:

MATH 123	Calculus I for Management, Life, and Social Sciences	3 cr.
	or	
MATH 127	Calculus I with Pre-Calculus Review	5 cr.
	or	
MATH 133	Calculus I	4 cr.
MATH 124	Calculus II For Management, Life, and Social Sciences	3 cr.
	or	
MATH 134	Calculus II	4 cr.
MATH 251	Advanced Discrete Mathematics	3 cr.
	or	
MATH 281	Foundations of Mathematics I	3 cr.
		<b>Subtotal: 9-11</b>

Three additional Math courses numbered 290 or above

(excluding MATH 302, MATH 331, MATH 380, MATH 384, and MATH 441), and at least 3 credits of which must be:

MATH 418	Introduction to Modern Algebra	3 cr.
	or	
MATH 421	Real Analysis	3 cr.
		<b>Subtotal: 9</b>

Subtotal: 18-20

Total Credit Hours: 18-20

### Media Minor

#### Degree Requirements

The minor requirement is 19 credit hours, as follows:

COMM 100	Principles of Communication	3 cr.
	or	
COMM 233	Business Writing and	3 cr.

	Communication	
COMM 205	Mass Communication	3 cr.
COMM 245	Video Editing and Production	4 cr.
COMM 251	Video Communication	3 cr.
		<b>Subtotal: 13</b>

Plus any two of the following courses:

JRNL 100	Journalism: Practices and Principles	3 cr.
COMM 285	Introduction to Public Relations	3 cr.
COMM 324	Media Industries, Government, and Society	3 cr.
COMM 326	Race, Gender, and Ethnicity in the Media	3 cr.
COMM 352	Multimedia Communication	3 cr.
COMM 356	Global Communication	3 cr.
		<b>Subtotal: 6</b>

Subtotal: 19

Total Credit Hours: 19

### Music Minor

#### Degree Requirements

Two required 3-credit MUS courses (6 credits)

MUS 101	Introduction to Music	3 cr.
MUS 201	Basic Music Theory and Composition	3 cr.
		<b>Subtotal: 6</b>

Four credits in MUS performance selected from:

MUS 141-148	University Singers	1 cr.
MUS 151-158	Campus Chorus	1 cr.
MUS 161-168	Pep Band	1 cr.
MUS 181-188	Concert Band	1 cr.
		<b>Subtotal: 4</b>

Eight additional credits in MUS performance selected from:

MUS 110	Beginning Guitar	3 cr.
MUS 141-148	University Singers	1 cr.
MUS 151-158	Campus Chorus	1 cr.
MUS 161-168	Pep Band	1 cr.
MUS 181-188	Concert Band	1 cr.
MUS 210	Intermediate Guitar	3 cr.
MUS 290	Special Topics in Music	1-3 cr.
		<b>Subtotal: 8</b>

Subtotal: 18

Total Credit Hours: 18

## Neuroscience Minor

This minor's requirement is NSCI 212 plus 15 additional credit hours in neuroscience.

### Degree Requirements

3 credits NSCI 212

NSCI 212	Introduction to Behavioral Neuroscience	3 cr.
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**Subtotal: 3**

Plus 15 additional credit hours in neuroscience (NSCI)

**Subtotal: 15**

Subtotal: 18

Total Credit Hours: 18

## Philosophy Minor

The minor requirement is 18 credit hours consisting of any six philosophy courses.

### Degree Requirements

Any 2 courses in Metaphysics and Epistemology from the following (six credit hours):

PH 103	Introduction to Philosophy	3 cr.
PH 316	Philosophy and Climate Change	3 cr.
PH 341	Modern and Contemporary Philosophy	3 cr.

**Subtotal: 6**

Any 2 courses in Value Theory and Ethics

from the following (six credit hours):

PH 208	Ethics	3 cr.
PH 210	Ethics for Social Workers	3 cr.
PH 211	Business Ethics	3 cr.
PH 225	Ethics of Digital Technologies	3 cr.
PH 231	Biomedical Ethics	3 cr.
PH 241	Environmental Ethics	3 cr.
PH 245	War, Terrorism and Torture	3 cr.
POSC 207/LSOC 207/PH 207	Introduction to Political Theory	3 cr.
LSOC 330	Contemporary Political Theory	3 cr.

**Subtotal: 6**

Any 2 courses in Non-Western Philosophy

from the following (six credit hours):

PH 204	Symbolic Logic	3 cr.
PH 214	World Ethics	3 cr.
PH 304/REL 304	Philosophy of Religion and	3 cr.

## Spirituality

**Subtotal: 6**

Subtotal: 18

Total Credit Hours: 18

## Political Science Minor

### Degree Requirements

The minor requirement is 18 credit hours as follows:

POSC 102	American National Government	3 cr.
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**Subtotal: 3**

Plus 15 credit hours of 200, 300, or 400 level political science courses (POSC).

**Subtotal: 15**

Subtotal: 18

Total Credit Hours: 18

Within these course requirements, a student must take at least three credit hours in American politics, international relations, comparative government, and political thought.

## Psychology Minor

The minor requirement is PSY 101 plus 15 additional credit hours in psychology.

### Degree Requirements

Plus 15 credits in psychology courses

**Subtotal: 15**

Requirements List - PSY 101

PSY 101	Introduction to Psychology	3 cr.
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**Subtotal: 3**

Subtotal: 18

Total Credit Hours: 18

Note: internships, independent study, and undergraduate research may not be used to fulfill these requirements.

## Public Administration Minor

### Degree Requirements

The minor requirement is 18 credit hours selected from the courses listed below:

Required courses (six credit hours):

POSC 102	American National Government	3 cr.
POSC 205	Public Administration	3 cr.

**Subtotal: 6**

Plus any four of the following (twelve credit hours):

POSC 210	State and Local Politics	3 cr.
POSC 212	Political Analysis	3 cr.
POSC 218	Public Policy in America	3 cr.
POSC 322	The U.S. Presidency	3 cr.
POSC 325/LSOC 325	Constitutional Law	3 cr.

POSC 340/LSOC 340	International Governance and Law	3 cr.
POSC 342	Environmental Politics	3 cr.
EC 351	Economics and Government	3 cr.
EC 355	Public Finance	3 cr.
SO 305	The Sociology of Urban Life	3 cr.

**Subtotal: 12**

Subtotal: 18

Total Credit Hours: 18

### Public Relations Minor

#### Degree Requirements

The minor requirement is 18 credit hours, as follows:

COMM 100	Principles of Communication	3 cr.
	or	
COMM 233	Business Writing and Communication	3 cr.
COMM 285	Introduction to Public Relations	3 cr.
COMM 328	Health Communication Campaigns	3 cr.
JRNL 100	Journalism: Practices and Principles	3 cr.

**Subtotal: 12**

Plus any two of the following courses:

COMM 245	Video Editing and Production	4 cr.
COMM 280	Organizational Communication	3 cr.
COMM 320	Small Group Communication	3 cr.
COMM 340	Business Communication	3 cr.
COMM 344	Event Planning	3 cr.
COMM 348	Intercultural Communication	3 cr.
COMM 356	Global Communication	3 cr.

**Subtotal: 6**

Subtotal: 18

Total Credit Hours: 18

### Quantitative Economics Minor

#### Degree Requirements

The minor requirement is 18 credit hours as follows:

MATH 133	Calculus I	4 cr.
	or	
MATH 123	Calculus I for Management, Life, and Social Sciences	3 cr.
EC 117	Principles of Quantitative Economics	3 cr.
EC 215	Intermediate Macroeconomics	3 cr.
EC 216	Intermediate Microeconomics	3 cr.

EC 490	Seminar: Issues in Contemporary Economics	3 cr.
EC 2XX/3XX	Economics Elective	3 cr.

**Subtotal: 18-19**

Subtotal: 18-19

Total Credit Hours: 18-19

### Social Justice Minor

#### Degree Requirements

The minor requirement is 18 hours, as follows:

Required courses

SW 100	Introduction to Social Work	3 cr.
SW 303	Generalist Social Work Practice III	3 cr.
SW 313	Social Welfare and Social Policy	3 cr.

**Subtotal: 9**

Plus three of the following courses:

EC 106	The Economics of Poverty and Discrimination	3 cr.
POSC 101/INST 101	Introduction to Contemporary Global Issues	3 cr.
SW 320	Dynamics of Oppression and Empowerment	3 cr.
SO 410	Social Change	3 cr.
PSY 327	Multicultural Psychology	3 cr.
COMM 348	Intercultural Communication	3 cr.
BL 424	Business Law for Human Resource Management	3 cr.
ENGL XXX	English Elective	3 cr.
MAN 305	Managing for Sustainability	3 cr.
POSC 218	Public Policy in America	3 cr.
POSC 326	Civil Liberties	3 cr.
PSY 315	Cultural Psychology	3 cr.
SO 201	Social Problems	3 cr.
SO 413	Social Inequality	3 cr.
PSY 317	Psychology of the Exceptional Person	3 cr.
SW 314	Practicum in Social Justice and Macro-level Change	3 cr.

**Subtotal: 9**

Subtotal: 18

Total Credit Hours: 18

### Social Work Minor

#### Degree Requirements

The minor requires the following courses:



SW 100	Introduction to Social Work	3 cr.
SW XXX	Social Work Elective	3 cr.
SW XXX	Social Work Elective	3 cr.
SW XXX	Social Work Elective	3 cr.
SW XXX	Social Work Elective	3 cr.
SW XXX	Social Work Elective	3 cr.

**Subtotal: 18**

Subtotal: 18

Total Credit Hours: 18

**Sociology Minor****Degree Requirements**

The minor requirement is 18 credit hours, as follows:

SO 101	Introduction to Sociology	3 cr.
SO XXX	Sociology Elective	3 cr.
SO XXX	Sociology Elective	3 cr.
SO XXX	Sociology Elective	3 cr.
SO XXX	Sociology Elective	3 cr.
SO XXX	Sociology Elective	3 cr.

**Subtotal: 18**

Subtotal: 18

Total Credit Hours: 18

**Spanish Minor****Degree Requirements**

The minor requirement is 18 credit hours selected from the courses below:

Required five courses (15 hours):

SPAN 203	Intermediate Spanish I	3 cr.
SPAN 204	Intermediate Spanish II	3 cr.
SPAN 305	Advanced Conversational Spanish I	3 cr.
SPAN 306	Advanced Conversational Spanish II	3 cr.
SPAN 325	Goya to Almodovar: Hispanic Culture	3 cr.

**Subtotal: 15**

Choose any one from the following:

CUL 250	Latin American Civilization	3 cr.
SPAN 290	Special Topics in Spanish	1-3 cr.
SPAN 140	Spanish for Social Services	3 cr.
SPAN 130	Spanish for Criminal Justice	3 cr.
SPAN 102	Elementary Spanish II	3 cr.

**Subtotal: 3**

Subtotal: 18

Total Credit Hours: 18

**Statistics Minor****Degree Requirements**

The minor requirement is 20-22 credit hours, as follows:

One of the following introductory statistics courses, with MATH 121 recommended.

BIS 221	Statistics for Business Analytics	3 cr.
IE 212	Probability and Statistics	3 cr.
MATH 120	Intro Statistics for the Arts & Sciences	3 cr.
MATH 121	Introductory Probability and Statistics	3 cr.
PSY 207	Statistics for the Behavioral Sciences	3 cr.

**Subtotal: 3**

The following four courses:

MATH 221	Introductory Probability & Statistics II	3 cr.
MATH 306	Linear Algebra	3 cr.
MATH 331	Computation in Statistics	3 cr.
MATH 441	Data Visualization & Data Techniques	3 cr.

**Subtotal: 12**

MATH 306 has a prerequisite of either MATH 124 or MATH 134 or MATH 251.

One of the following courses

BIS 450	Multivariate & Big Data Analysis	3 cr.
EC 386	Econometrics	3 cr.
IE 429	Design and Analysis of Experiments	3 cr.
MATH 372	Probability	3 cr.
MATH 384	Applied Regression & Time Series	3 cr.

**Subtotal: 3**

One of the following computer programming courses:

CS 102/IT 102	Introduction to Programming	4 cr.
CS 171	Programming for Mathematics	4 cr.
BIS 315	Data Science with Python	3 cr.
ENGR 105/HONE 105	Computer Programming for Engineers	2 cr.

**Subtotal: 2-4**

Subtotal: 20-22

Total Credit Hours: 20-22

## Theatre Minor

### Degree Requirements

#### Requirements List

The minor requirement is 18 credit hours in THTR, with no more than 6 credits in THTR 151 - THTR 159 and THTR 160 (p. 318) - THTR 169.

One from ENGL 310, ENGL 314, ENGL 315, ENGL 316 may be substituted for a 3 credit THTR course.

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**Subtotal: 18**

Subtotal: 18

Total Credit Hours: 18

## Women's and Gender Studies Minor

The Women's and Gender Studies (WGST) minor involves 18 credit hours of coursework. Each student must take courses from a minimum of three different disciplines (Social Work, Sociology, and at least one other).

### Degree Requirements

There are three required courses:

SW 100	Introduction to Social Work	3 cr.
SO 208	Gender	3 cr.
CJ/SO/SW 33X	Independent Study (internship in Senior year)	3 cr

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**Subtotal: 9**

Plus any three additional courses from the following list:

CJ 302	Women and the Criminal Justice System	3 cr.
COMM 326	Race, Gender, and Ethnicity in the Media	3 cr.
ENGL 358	Women in Literature	3 cr.
FILM 370	Women and Film	3 cr.
HIST 251	Early American Women's History to 1865	3 cr.
HIST 373	Women In Latin America	3 cr.
PSY 305	Psychology of Women	3 cr.
SW 320	Dynamics of Oppression and Empowerment	3 cr.

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**Subtotal: 9**

Subtotal: 18

Total Credit Hours: 18

Or any other course with a primary focus on women or gender, dependent upon the approval of the director of the WGST minor program.

\*Although Independent Study in Social Work is the default option, internship experiences housed in other departments can be used subject to the prior approval of the director of the WGST minor.

## DESCRIPTION OF UNDERGRADUATE CERTIFICATE PROGRAMS

### Certificate Program in Chemistry

Recognizing the need for qualified workers trained in chemistry to fill positions in the chemical industry, and in other areas such as hospital and environmental laboratories highly dependent upon chemical technology, the University offers a Certificate in Chemistry. The certificate requires the completion of 20 credit hours in chemistry courses and, in addition, the prerequisites to these courses.

#### Degree Requirements

Certificate requirements are as follows:

CHEM 209	Organic Chemistry I	3 cr.
CHEM 210	Organic Chemistry II	3 cr.
CHEM 219	Organic Chemistry Laboratory I	1 cr.
CHEM 220	Organic Chemistry Laboratory II	1 cr.
CHEM 211	Analytical Methods	3 cr.
CHEM 221	Analytical Methods Laboratory	1 cr.
CHEM 312	Instrumental Analysis	3 cr.
CHEM 322	Instrumental Analysis Laboratory	1 cr.
CHEM 314	Biochemistry	3 cr.
CHEM 324	Biochemistry Laboratory	1 cr.
		<b>Subtotal: 20</b>

Subtotal: 20

Total Credit Hours: 20

### Certificate Program in Communication

Recognizing that communication is a skill much needed today, the University offers a program that strengthens understanding, writing, and speaking.

#### Degree Requirements

Completion of the program requires 18 credit hours (plus any prerequisites).

COMM 100	Principles of Communication	3 cr.
or		
COMM 233	Business Writing and Communication	3 cr.
COMM 102	Introduction to Public Speaking	3 cr.
COMM 320	Small Group Communication	3 cr.
COMM 340	Business Communication	3 cr.
COMM 3XX	COMM Elective	3 cr.
COMM 3XX	COMM Elective	3 cr.
		<b>Subtotal: 18</b>

Subtotal: 18

Total Credit Hours: 18

### Diversity Management Certificate

Entry Requirement

Degree seeking students can earn a Leadership certificate by completing three courses with a grade of "C" or higher. These three courses may also meet College of Business elective or major requirement.

This certificate is not available to non-degree seeking students.

This certificate is issued at graduation.

#### Degree Requirements

Required three courses:

MAN 322	Managing a Diverse Workforce	3 cr.
MAN 331	A Humanistic Approach to Leadership and Management	3 cr.
MAN 341	Leadership and Change	3 cr.
		<b>Subtotal: 9</b>

Subtotal: 9

Total Credit Hours: 9

### Enterprise Resource Planning (ERP) Certificate with SAP (SAP Certificate)

Degree seeking students can earn SAP certificate by completing three COB courses, with a grade of "C" or higher, which include substantial hands-on component working with SAP software for business process design and implementation. These three courses could also meet College of Business Core courses requirement.

Students must take BUS 312 or HONB 312 to complete the SAP certificate requirement. The certificate is issued at graduation and is sanctioned by the SAP University Alliance.

SAP is not available to non-degree seeking students.

#### Degree Requirements

Select any three courses from:

BIS 202	Introduction to Business Information Systems	3 cr.
BUS 312/HONB 312	Business Processes and Enterprise Resource Planning with SAP	3 cr.
BIS 312	Quality and Operations Management with SAP	3 cr.
or		
BIS 412	Business Analytics with SAP	3 cr.
		<b>Subtotal: 9</b>

Subtotal: 9

Total Credit Hours: 9

### Human Resource Management Fundamental Certificate

#### Entry Requirement

Degree seeking students can earn a Leadership certificate by completing three courses with a grade of "C" or higher. These three courses may also meet College of Business elective or major requirement.

This certificate is not available to non-degree seeking students.

This certificate is issued at graduation.

#### Degree Requirements

Required three courses:

HRM 323	Human Resource Management	3 cr.
HRM 324	Performance Management	3 cr.
HRM 436	Compensation and Benefits	3 cr.

**Subtotal: 9**

Subtotal: 9

Total Credit Hours: 9

### Innovation and Entrepreneurship Certificate

Degree seeking students can earn an Innovation and Entrepreneurship certificate by completing ENTR 251, ENTR 480 or, and BUS 423/BME 423/ME 423 and one of the following ENTR 430, MK 302, MK 372, or FIN 330 with a grade of "C" or higher

#### Degree Requirements

Two required courses:

ENTR 251	Entrepreneurship and Innovation	3 cr.
BUS 423/BME 423/ME 423	Product Development and Innovation	3 cr.

**Subtotal: 6**

Plus one of the following courses

ENTR 480	Internship in Entrepreneurship	3 cr.
	or	
MK 302	Market Analysis	3 cr.
	or	
MK 372	Digital Media Marketing Strategies	3 cr.
	or	
FIN 330	Financing Entrepreneurial Ventures	3 cr.

**Subtotal: 3**

Subtotal: 9

Total Credit Hours: 9

This certificate is not available to ENTR major or minor candidates.

This certificate is not available to non-degree seeking students.

The certificate is issued at graduation.

### Leadership Certificate

#### Entry Requirement

Degree seeking students can earn a Leadership certificate by completing three courses with a grade of "C" or higher. These three courses may also meet College of Business elective or major requirement.

This certificate is not available to non-degree seeking students.

This certificate is issued at graduation.

#### Degree Requirements

Required three courses:

MAN 303	Interpersonal Skills for Leading	3 cr.
MAN 341	Leadership and Change	3 cr.
MAN 353	Leadership and Team Skills	3 cr.

**Subtotal: 9**

Subtotal: 9

Total Credit Hours: 9

### Project Management Certificate

#### Entry Requirement

Degree seeking students can earn a Project Management certificate by completing three courses with a grade of "C" or higher. These three courses may also meet College of Business elective or major requirement.

This certificate is not available to non-degree seeking students.

This certificate is issued at graduation.

#### Degree Requirements

Required three courses:

MAN 353	Leadership and Team Skills	3 cr.
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MAN 370	Project Management	3 cr.
MAN 422	Conflict Resolution	3 cr.

**Subtotal: 9**

Subtotal: 9

Total Credit Hours: 9

### Remote Work Skills Certificate

Degree seeking students can earn a Remote Work Skill certificate by completing three courses with a grade of "C" or higher. These three courses may also meet College of Business electives or major requirements.

This certificate is issued at graduation.

This certificate is not available to non-degree seeking students.

### Degree Requirements

Select three courses from:

BUS 350	Business Etiquette and Professionalism	3 cr.
MAN 353	Leadership and Team Skills	3 cr.
MAN 370	Project Management	3 cr.

**Subtotal: 9**

Subtotal: 9

Total Credit Hours: 9

### SAS Certificate

Degree seeking students can earn SAS certificate by completing as few as four College of Business courses, with a grade of "C" or higher, which include substantial hands-on component working with SAS Enterprise Miner software for Business Analytics, Business Intelligence, and Data Management.

The certificate is issued at graduation and is sanctioned by the SAS Institute Academic Programs.

SAS certificate is not available to non-degree seeking students.

### Degree Requirements

Required four courses:

BIS 230	Business Analytics Theory & Practice	3 cr.
BIS 330	Applied Data Mining	3 cr.
BIS 445	Business Analytics Project	3 cr.
BIS 450	Multivariate & Big Data Analysis	3 cr.

**Subtotal: 12**

Subtotal: 12

Total Credit Hours: 12

### Socially Conscious Management Certificate

Entry Requirement

Degree seeking students can earn a Leadership certificate by completing three courses with a grade of "C" or higher. These three courses may also meet College of Business elective or major requirement.

This certificate is not available to non-degree seeking students.

This certificate is issued at graduation.

### Degree Requirements

Required three courses:

MAN 240/HONB 240	Business and Society	3 cr.
MAN 305	Managing for Sustainability	3 cr.
MAN 315/SO 315	Organizational Theory	3 cr.

**Subtotal: 9**

Subtotal: 9

Total Credit Hours: 9

## UNDERGRADUATE COURSES

In general, the number of each course is related to the level of the course. The 100 series indicates introductory courses and the higher numbers indicate courses of a more advanced nature. Courses in the 500- and 600-level series are restricted to graduate students. For further information about an academic area, consult the Dean of the college listed in parentheses.

### Notes

See Legend for Notes in Sequence of Courses (p. 37)

## AC - ACCOUNTING

### AC 101 - Financial Reporting I (3 cr.)

Cross-Listed as: AC 201/HONB 203

This course provides an introduction to the basic concepts and framework of financial accounting with an emphasis placed on the interpretation and use of the information contained in the primary financial statements. Key outcomes include an understanding of underlying accounting concepts and principles, the accounting information process, and the elements of the balance sheet, income statement, and the statement of cash flows.

Distribution: BUSR/MR

Offered: fall and spring semesters.

This course is a prerequisite.

Formerly "Financial Reporting"

Formerly AC 201 "Introduction to Accounting I". Equivalent to AC 201/HONB 203

### AC 190 - 191 - Special Topics in Accounting (1 - 3 cr.)

This is a study of advanced topics in accounting of special interest to accounting majors, but not carried in the catalog on a regular basis. The course may be repeated for credit if the topic varies.

### AC 202 - Managerial Accounting (3 cr.)

Prerequisite: AC 101/HONB 203/AC 201, and MATH 111 or MATH 123 or MATH 133

This course provides an introduction to managerial accounting, with an emphasis on the planning, control, and decision-making functions of management. Key outcomes include an understanding of cost behavior, product costing, cost-volume-profit analysis, budgeting, and identification of relevant costs for decision-making purposes.

Distribution: BUSR/MR

Offered: fall and spring semesters

This course is a prerequisite.

Formerly "Introduction to Accounting II"

### AC 204 - Tools and Concepts in Accounting (3 cr.)

Prerequisite: AC 101/HONB 203/AC 201

The primary objective of this course is to provide a foundational understanding of accounting concepts and tools. This course takes students from double-entry accounting through an elementary understanding of how to construct financial statements. Key outcomes include an ability to apply the conceptual framework to journalizing transactions, adjusting and closing entries, the

accounting information process (cycles), and creating the balance sheet, income statement, and the statement of cash flows.

Offered: summer only.

### AC 291 - Special Topics in Accounting (1 - 3 cr.)

This is a study of advanced topics in accounting of special interest to accounting majors, but not carried in the catalog on a regular basis. The course may be repeated for credit if the topic varies.

### AC 305 - Financial Reporting II (3 cr.)

Prerequisite: Grade of "C" or better in AC 204

This second course in financial reporting is the first of a three-course sequence that offers an in-depth examination of the financial reporting process. Emphasis is placed on the application of theory to the preparation and use of financial accounting information. Key outcomes include an understanding of the flow of information through the accounting cycle and the measurement and reporting requirements for cash, receivables, inventories, plant and equipment, intangible assets and investments and stockholders' equity.

Distribution: MR

Offered: fall and spring semester

This course is a prerequisite.

### AC 306 - Financial Reporting III (3 cr.)

Prerequisite: Grade of "C" or better in AC 305.

This is the second in a three-course sequence offering an in-depth examination of the financial reporting process. Similar to AC 305, emphasis is placed on the application of theory to the preparation and use of financial accounting information. Key outcomes include an understanding of the measurement and reporting requirements for current liabilities, long-term liabilities, bonds, pensions, leases, current and deferred income taxes, changes in accounting methods and error corrections, and earnings per share.

Distribution: MR

Offered: fall and spring semester.

This course is a prerequisite.

### AC 311 - Municipal & Fund Accounting (3 cr.)

Prerequisite: AC 101/HONB 203/AC 201

This course examines accounting concepts for nonprofit organizations. Key outcomes include an understanding of generally accepted accounting principles as they apply to governmental and municipal organizations, educational institutions, hospitals, and social organizations. Resource budgets will also be examined.

Distribution: MR

Offered: fall and spring semester.

### AC 313 - Taxation of Individuals (3 cr.)

Prerequisite: AC 202

This course provides an introduction to the federal tax system, with an emphasis on the federal income taxation of individuals and unincorporated businesses. Key outcomes include an understanding of the fundamental concepts of income, deductions, and the determination of tax liability.

Distribution: MR

Offered: fall and spring semesters

Formerly "Fundamental Concepts of Taxation"  
Formerly AC 313 "Concepts of Tax Structure"

Formerly AC 413 Fundamentals of Individual Tax

### **AC 330 - Accounting Information Systems (3 cr.)**

Prerequisite: AC 305

This course is designed to examine the relationship between a company's information system technology and its accounting information system (AIS). Key outcomes include an understanding of database management systems, the objectives and procedures of internal controls, typical business documents and reports processes and measures, proper system documentation, the general ledger and business report, and systems development. Describe an entity's IT environment and its impact on the financial reporting.

Distribution: MR

Offered: fall and spring semesters.

### **AC 333 - Independent Study in Accounting (1-3 cr.)**

See "Independent Study".

### **AC 334 - Independent Study in Accounting (1-3 cr.)**

See "Independent Study".

### **AC 390 - Special Topics in Accounting (3 cr.)**

This is a study of advanced topics in accounting of special interest to accounting majors, but not carried in the catalog on a regular basis. The course may be repeated for credit if the topic varies.

### **AC 414 - Taxation of Entities (3 cr.)**

Prerequisite: AC 313

Corequisite: AC 313

This course provides an introduction to the federal taxation of business entities. Key outcomes include an understanding of the fundamental concepts of the federal income taxation of corporate formations, earnings, and distributions, as well as the federal taxation of partnerships, S corporations, and other pass-through entities.

Distribution: MR

Offered: fall and spring semesters

Formerly Adv Topics in Taxation

### **AC 419 - Auditing and Assurance Services (3 cr.)**

Prerequisite: AC 305

This course introduces students to the role of financial statement audits and other assurance services in enhancing the relevance and reliability of information. Key outcomes include basic knowledge of risk analysis, internal controls, information technology, sampling, legal liability, and professional conduct.

Distribution: MR

Offered: fall semester

### **AC 440 - Accounting Analytics (3 cr.)**

Prerequisite: AC 306

This course explores how financial statement data and non-financial metrics can be linked to financial performance through data analytics. Topics include analytic techniques for decision-making and the examination of "big data" involving accounting information. Hands-on experiences will develop skills with select software tools used in data analytics for accounting professionals. While many accounting and financial organizations deliver data, accounting analytics deploys that data to deliver insight, and this course will explore the many areas in which accounting data provides insight into other business areas. This course will help students make better business decisions through the use of financial data and accounting analytics.

Distribution: MR

Offered: fall and spring semesters.

formerly AC 340

### **AC 480 - Internship in Accounting (3 cr.)**

See "Internships".

### **AC 481 - Internship in Accounting (3 cr.)**

See "Internships".

### **AC 491 - Special Topics in Accounting (3 cr.)**

This is a study of advanced topics in accounting of special interest to accounting majors, but not carried in the catalog on a regular basis. The course may be repeated for credit if the topic varies.

## **AEM - ARTS AND ENTERTAINMENT MANAGEMENT**

### **AEM 250 - Introduction to Arts & Entertainment Organizations (3 cr.)**

Prerequisite: MAN 204/HONB 204; PSY 101 or SO 101

This course introduces the field of arts and entertainment management with a focus on the essential nature of creative organizations and projects, including those that are nonprofit. Key learning outcomes focus on an understanding and recognition of the history and evolution of the arts and entertainment industry; the internal culture and structure of creative organizations; external influences on the arts and entertainment industry; vocabulary and themes unique to arts and entertainment concerns; research skills including data collection and analysis; and arts and entertainment career exploration and investigation.

Distribution: MR

Formerly "Managing Arts & Entertainment Organizations"

### **AEM 333 - Independent Study in Arts and Entertainment Management (1-3 cr.)**

See "Independent Study"

### **AEM 334 - Independent Study in Arts and Entertainment Management (1-3 cr.)**

See "Independent Study"

### **AEM 350 - Arts and Entertainment Practicum (3 cr.)**

Prerequisite: AEM 250 and Arts & Entertainment Management major.

This course focuses on the management process involved in producing events within the arts and entertainment domain. During the course, students will produce an arts and entertainment event on campus or in the local community. Key learning outcomes focus on the role that managers fulfill in the project management process including establishing project feasibility, planning, organizing, and leading artists and other technical personnel, scheduling, budgeting and post-event assessment, and the use of technology to support event management processes.

Distribution: MR

Offered: in fall and spring.

Open to Arts and Entertainment Management students only.

### **AEM 355 - Arts and Entertainment Venue Operations (3 cr.)**

Prerequisite: AEM 250.

The course provides an overview of arts and entertainment venue operations. Key learning outcomes focus on understanding managerial issues related to various arts/entertainment facilities including museums and performance venues, venue finance, project feasibility, economic impact of venues and events, outsourcing of operational services, application of management principles including budgeting, promotion, public relations, security and risk management, event planning, and operations.

Distribution: MR

Offered: in fall, even years

### **AEM 390 - Special Topics in Arts and Entertainment Management (3 cr.)**

This is a study of advanced topics in arts and entertainment management of special interest to majors, but not carried in the catalog on a regular basis. The course may be repeated for credit if the topic varies.

### **AEM 465 - Seminar in Arts and Entertainment Management (3 cr.)**

Prerequisite: Arts and Entertainment Management Major and senior standing.

This capstone course examines contemporary issues and challenges for managers in the arts and entertainment industry. Key learning outcomes focus on understanding environmental forces shaping current practices in arts and entertainment organizations, maximization of arts and entertainment organization revenue streams including fundraising, grant writing, and membership development, and the nature and purpose of boards of directors. Strategies for arts and entertainment industry career determination and implementation are emphasized.

Distribution: MR

Offered: in spring.

### **AEM 480 - Internship in Arts and Entertainment Management (3 cr.)**

See "Internships."

### **AEM 481 - Internship in Arts and Entertainment Management (3 cr.)**

See "Internships."

### **ART - ART**

All ART courses satisfy Aesthetic Perspective requirement.

### **ART 101 - Introduction to Art (3 cr.)**

An introduction to the "Art" of appreciating art, this course is designed to help students feel more confident viewing and discussing the visual arts. In addition to traditional learning tools, students will be challenged by hands-on creative projects, two museum visits, DVD viewings, oral presentations, Western New England University art gallery visits, and ongoing online discussion questions. Exploring the various ways art has been created from pre-history up to the present will assist students in engaging their minds and imaginations to better understand the multiplicity of art movements that comprise the history of Western visual arts.

Offered: every semester.

Formerly "Art Appreciation"

### **ART 105 - Drawing I (3 cr.)**

This course is an introduction to drawing using a variety of mediums that could include pencil, charcoal, conte crayon, ink, and oil pastel. Since drawing entails direct communication from the eye to the hand, students work mainly from life, such as nature, the model and/or still life, as well as possible assignments using the imagination. The primary focus will be on building drawing skills with an emphasis on composition, so that volume, proportion, placement, value, and developing a strong inner color sense will be realized. Keeping a sketchbook during the semester and a museum visit may be offered in some courses.

Offered: every semester.

Art supply fees \$50.

### **ART 116 - Painting I (3 cr.)**

This studio art course introduces the basic elements of painting using acrylic colors. Students learn how to manipulate paint, mix pigments, and explore the many ways paint can be handled. Instruction is given on preparation and effective use of materials. Inspired by both still life and landscape, specific lessons encourage exploration of color, light, texture, transparency, impasto, and composition.

Offered: every year.

Formerly "Life Painting with Volumes of Color"

Art supply fees \$50.

### **ART 117 - Painting II (3 cr.)**

Prerequisite: ART 116

This studio art course continues to develop the skills introduced in ART 116.

Students further explore elements of painting through increasingly complex exercises translating concepts into visual images. Abstraction is introduced and explored.



Offered: every year.

Formerly "Painting with Volumes of Color II"

Art supply fees \$50.

### **ART 118 - Introduction to Jewelry Making (3 cr.)**

This course will provide students with the fundamental knowledge of jewelry-making through multiple hands-on projects. This course will provide the skills of basic beading techniques with various materials into wearable pieces of art: necklaces, earrings, and bracelets.

Art supply fees \$50.

### **ART 120 - Art of Hand Papermaking I (3 cr.)**

Students learn about preparation of the pulp; dip, pour, and paint methods of sheet formation; and pressing and drying of formed sheets. Students will explore decorative sheet formation techniques such as laminating, embedding, and surface embellishment. Finally, students will learn ways to use this paper as a medium for constructing works in paper, such as collage assemblage, casting, weaving, or 2- and 3-D cards.

Art supply fees \$50.

### **ART 130 - Color in Art & Design (3 cr.)**

This course explores the topic of color with approaches based on both theory and experience, while also introducing fundamentals of water-based paint and digital media. Classroom lectures will introduce painting materials and methods as well as the scientific, historical and contemporary context of color. Much of the class will be dedicated to experimentation with materials, in-class studio time, group collaboration, and critique.

Art supply fees \$50.

### **ART 140 - Design Principles Through Photography (3 cr.)**

Using basic photography (no special camera/equipment required), this introductory art course introduces the concepts of two-dimensional art and design: visual elements, formal principles of design, and the creative process. Students will strengthen creativity, problem-solving skills and communication through creative exercises, visual analysis, and discussion. As an introductory course, all levels of experience are welcome.

\$50

### **ART 190-193 - Special Topics in Art (1-3 cr.)**

Topics in art that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **ART 201 - Survey of Western Art I (3 cr.)**

A historical survey of Western art and architecture from ancient times to the beginning of the Renaissance.

Offered: every other year.

### **ART 202 - Survey of Western Art II (3 cr.)**

A historical survey of Western art and architecture from the middle of the Renaissance to the twentieth century.

Offered: every other year.

### **ART 205 - American Art (3 cr.)**

American art both reflects and influences the culture in which it is created. This course will analyze the evolution of major American artists, art movements, styles, and artistic elements from the 18th century to the present and their connections to the cultural ideas of the time. Iconic works of American painting, sculpture, photography and architecture will be visually "read," analyzed, and discussed. In addition to contextual analysis, this class will include formal visual analysis techniques to look at and discuss a work of art using standard art methods of analysis and art terminology. Selected readings, and required museum visit and WNE art gallery talk will supplement the visual analysis to highlight the connection between the art and the cultural context of the period. Upon completion of the course, students will be able to identify key art genres, movements, and artists in American culture, discern the stylistic characteristics of various periods, and explain the cultural context for a variety of iconic images that continue to shape our world today.

Offered: every other year.

This course aligns with the Aesthetic Perspective of the General University Requirements. Successful completion of this course will fulfill the Aesthetic Perspective.

### **ART 212 - London through the Ages (3 cr.)**

Cross-Listed as: HIST 212

This three-week summer course taught in London in conjunction with CUL 270 covers the history and culture of the city from the Roman period to the present day, and features extensive exploration of the city and its historic sites.

Satisfies the aesthetic perspective or historical perspective requirements.

### **ART 215 - Drawing II (3 cr.)**

Prerequisite: ART 105.

This is a rigorous course that enables students to develop their personal vision further, and to explore the medium of drawing more deeply, based on the foundation acquired in ART 105. Emphasis is on expanding the drawing skills through confrontation with the formal visual problems, using imagination, new ideas, new materials, and new techniques. One goal is to bring out the expressive qualities in each student.

Offered: every spring.

Formerly "Intermediate Drawing"

Art supply fees \$50.

### **ART 218 - Paper as Fiber Art (3 cr.)**

This course focuses on the exploration of paper as a creative medium in the world of fiber art. The history of paper as fiber art is covered. The versatility and potential of paper as art is demonstrated through the use of paper and paper pulp. Techniques such as alteration and collage design, texturizing paper, surface decoration of paper, book binding, and dipped sculpture will be covered so students can then use these techniques to design other works: Sculpture, altered art, collage, illumination, and book art, for example. Fiber art is presented to and explored by students as a major and exciting movement in

contemporary art. This course will satisfy the aesthetic perspectives requirement of the GUR.

Art supply fees \$50.

### **ART 225 - Impressionism (3 cr.)**

This course focuses on the development of Impressionism in art, a departure from realism. Representative figures, French, American, and British, will be studied, such as Monet and Renoir. Some attention will be paid both to the technique and philosophy of Impressionism, as well as to its cultural background.

Offered: in alternate years.

### **ART 240 - 2-D Art (3 cr.)**

This is a foundation level studio art course that explores different methods of solving two-dimensional visual problems based on the elements and principles of design. Hands-on projects involving a variety of mediums and materials encourage students to creatively strengthen their problem-solving skills while building communication skills through written and group critiques as well as a paper based on a museum visit.

This course will satisfy the aesthetics perspectives requirement of the GUR.

Art supply fees \$50.

### **ART 250 - 3-D Art (3 cr.)**

This is a foundation level studio art course that explores the manipulation of various 2-D and 3-D materials to create 3-D artworks through use of the Elements and Principles of Design. There may also be a museum visit, as well as visits to the Western New England University Art Gallery to view original 3-D artwork in a public, professional setting. Students will test and strengthen their problem-solving and communication skills through a series of hands on projects involving wire, plaster casting, found objects, and multiple recyclables, as well as written and group critiques.

Art supply fees \$50.

### **ART 290-295 - Special Topics in Art (1-3 cr.)**

Prerequisite: Sophomore standing.

Topics in art that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **ART 310 - Medieval Architecture and Society (3 cr.)**

Prerequisite: Junior standing.

Cross-Listed as: HIST 310

This course examines the monuments of medieval architecture in their historical context. We will study knightly castles and peasant cottages as well as the great Romanesque and Gothic abbeys and cathedrals, with the ultimate goal of learning not only about the buildings themselves but the society that created them.

Satisfies both the aesthetic perspective and historical perspective requirements.

### **ART 333 - Independent Study in Art (1-3 cr.)**

See "Independent Study".

### **ART 334 - Independent Study in Art (1-3 cr.)**

See "Independent Study".

### **ART 390-392 - Special Topics in Art (1-3 cr.)**

Prerequisite: Junior standing.

Topics in art that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

## **AS - AEROSPACE STUDIES**

### **AS 111 - Air Force Today Heritage and Values I (1 cr.)**

Provides an introduction to the Air Force, hopefully encouraging students to pursue an AF career or at least seek additional information to be better informed about the role of the USAF. The course allows students to examine general aspects of the Department of the Air Force, Air Force Leadership, Air Force benefits, and opportunities for Air Force officers. The course also lays the foundation for becoming an Airman by outlining our heritage and values. All textbooks and special reference materials are supplied by the department.

Formerly "Air Force Today I"

### **AS 112 - Air Force Today Heritage and Values II (1 cr.)**

Continuation of AS 111. Builds on the heritage and values that are the foundation of the Air Force while preparing students for more in-depth studies the following year. All textbooks and special reference materials are supplied by the department.

Formerly "Air Force Today II"

### **AS 191 - Advanced Physical Conditioning (1 cr.)**

AFROTC Cadets will take the Air Force Physical Fitness Assessment in accordance with Air Force Instruction 36-2905. Physical Fitness Gear (clothing) will be worn in accordance with Air Force Instruction 36-2903.

Student must have a sports physical on file to participate in this class. Visit UMass Dickinson Hall, Room 207 for additional information or call (413) 545-2437.

Formerly "Advanced Physical Fitness"

### **AS 223 - Team & Leadership Fundamentals (1 cr.)**

Provides the foundation for both leadership and team building. Sample topics include listening, followership, and problem solving efficiently. All of these concepts will be applied in team building activities. Though the theme of this course is "Team and Leadership Fundamentals," you are also expected to demonstrate basic verbal and written communication skills at the end of this course. All textbooks and special reference materials are supplied by the department.

Formerly "Air Force Way"

### **AS 224 - Team & Leadership Fundamentals II (1 cr.)**

Continuation of AS 223 to provide a solid foundation of leadership and team building competencies. All textbooks and special reference materials are supplied by the department.

Formerly "Air Force Way II"

### **AS 335 - Leading People and Effective Communication I (3 cr.)**

The goal is for cadets to have a more in-depth understanding of how to effectively lead people, and provide them with the tools to use throughout their detachment leadership roles. Secondly, cadets will hone their writing and briefing skills. All textbooks and special reference materials are supplied by the department.

Formerly "Air Force: Leadership and Management I"

### **AS 336 - Leading People and Effective Communication II (3 cr.)**

Build on the lessons learned in AS 335 with a focus on leadership and ethics. All textbooks and special reference materials are supplied by the department.

Formerly "Air Force: Leadership and Management II"

### **AS 441 - National Security Leadership Responsibilities and Commissioning Preparation I (3 cr.)**

Comprehend the basic elements of national security policy and processes. The student should know basic Air Force domain operations as well as understand selected roles of the military in society and current domestic and international issues affecting the military profession. Cadets should understand the responsibility, authority, and functions of an Air Force commander and selected provisions of the military justice system. This course will further develop the ability to communicate both written and orally. All textbooks and special reference materials are supplied by the department.

Formerly "National Security Policy I"

### **AS 442 - National Security, Leadership Responsibilities and Commissioning Preparation II (3 cr.)**

Continuation of AS 441 and focused on preparing students to transition to commissioned officers in the United States Air Force. All textbooks and special reference materials are supplied by the department.

Formerly "Preparation for Active Duty"

## **BIO - BIOLOGY**

### **BIO 101 - Basic Biology: Organisms (3 cr.)**

This is an introduction to the biology of organisms and their component parts. Intended primarily for nonmajors, the emphasis is on the structure and function of human cells and organs.

Distribution: GUR/MR

Offered: fall and spring semesters

Two class hours, three-hour lab.

Laboratory fees \$100.

### **BIO 107 - General Biology I (3 cr.)**

Prerequisite: One unit of secondary school chemistry, or complete CHEM 101 or CHEM 103 or CHEM 105 (or concurrently); and BIO 117 or concurrently.

Intended for science majors, this course focuses on introductory cellular and molecular biology. Concepts around which the course is built include cellular biochemistry, metabolism, and genetics. Students should be comfortable with those principles of general chemistry that are needed to develop an understanding of these concepts.

Distribution: GUR/MR

Offered: fall semester

This course is a prerequisite.

### **BIO 108 - General Biology II (3 cr.)**

Prerequisite: BIO 107 and BIO 117;

Corequisite: BIO 118 or concurrently.

This is the second semester of the two-semester sequence of Introductory General Biology intended for biology and other science majors. The focus in this course is on the phylogenetic relationships as well as the structural and functional characteristics of the three life domains: the Archaea, the Bacteria, and the Eukarya.

Distribution: GUR/MR

Offered: spring semester

### **BIO 117 - General Biology Laboratory I (1 cr.)**

Prerequisite: BIO 107 or concurrently.

Students apply scientific thinking and basic technical skills to the study of cells. Methods practiced include microscopy, spectroscopy, and chromatography as well as the collection, graphing, and interpretation of data.

Distribution: GUR/MR

Offered: fall semester

This course is a prerequisite.

Three-hour lab.

Laboratory fees \$100.

### **BIO 118 - General Biology Laboratory II (1 cr.)**

Prerequisite: BIO 108 or concurrently.

Students examine the difference between various types of organisms and conduct inquiry-based experiments using an organismal model system. Students also learn and use applicable terminology related to organismal biology.

Distribution: MR

Offered: spring semester

Three-hour lab.

Laboratory fees \$100.

### **BIO 152 - Human Heredity (3 cr.)**

Prerequisite: BIO 101 or BIO 103 or BIO 107/BIO 117

This course introduces the student to an overview of hereditary issues in humans. Topics include inheritance patterns, DNA profiling uses in forensics, gene therapy, recombinant DNA technologies, and pedigree analysis.

BIO 101 or BIO 103 or BIO 107/BIO 117, followed by this course, would meet the General University Requirements for the Natural Science Perspective (NSP).

This is a one semester course without a lab.

Credit for both this course and BIO 306 is not permissible.

### **BIO 153 - Principles of Environmental Science (3 cr.)**

Prerequisite: BIO 101 or BIO 103 or BIO 107/BIO 117 or CHEM 101 or CHEM 105 or GEOL 101.

Finding effective solutions to most environmental problems requires an understanding of sound science and engineering, good public policy, an appreciation of political and economic reality, and an ethical sense of the relationship between humans and the natural world. The interrelationships among these principles provide the unifying theme for this course, which will be covered in five parts.

Distribution: GUR/MR

BIO 101 or BIO 103 or BIO 107/BIO 117 or CHEM 101 or CHEM 105 or GEOL 101, followed by this course, would meet the General University Requirements for the Natural Science Perspective (NSP).

This is a one semester course without a lab.

### **BIO 156 - Biological Evolution (3 cr.)**

Prerequisite: BIO 101 or BIO 103 or BIO 107/BIO 117 or GEOL 101

An introduction to the historical development of the theory of evolution, the evidence for and mechanisms of evolution, and the major events in the history of life on Earth with emphasis on humans.

BIO 101 or BIO 103 or BIO 107/BIO 117 or GEOL 101, followed by this course, would meet the General University Requirements for the Natural Science Perspective (NSP).

This is a one semester course without a lab.

### **BIO 157 - Human Disease and Drug Therapy (3 cr.)**

Prerequisite: BIO 101 or BIO 103 or BIO 107/BIO 117

This course covers basic concepts of the molecular basis of disease and drug therapy using a systemic approach. A spectrum of human diseases and the specific mechanisms of action and physiological effects of various classes of drugs used to treat these diseases will be studied. Students will integrate concepts from cell biology, physiology, and biochemistry to understand different human diseases and their treatment by drugs.

BIO 101 or BIO 103 or BIO 107/BIO 117 followed by this course, would fulfill the GUR requirement for the Natural Science Perspective (NSP).

This is a one semester course without a lab.

### **BIO 158 - Microbes and Society (3 cr.)**

Prerequisite: BIO 101 or BIO 103 or BIO 107/BIO 117

Intended for non-majors, this course covers some of the basic concepts of microbiology with an emphasis on the role microbiology plays in today's society. Recognition of different classes of microbes, understanding the places in day-to-day existence where microbes exist, and understanding how microbes have had a significant impact

in history are emphasized. Microbes in industry, the environment, the human microbiome, and current, real-world applications of genetic engineering and biotechnology will be discussed. Classes will consist of lecture, group work and activities, and student presentations. An oral presentation and a written paper on a topic of interest are required.

BIO 101 or BIO 103 or BIO 107/BIO 117 followed by this course, would fulfill the GUR requirement for the Natural Science Perspective (NSP).

This is a one semester course without a lab.

### **BIO 190-191 - Special Topics in Biology (1-3 cr.)**

Topics in biology that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **BIO 201 - Plant Biology (4 cr.)**

Prerequisite: BIO 107, BIO 117, and at least sophomore standing.

Students examine various kinds of plants as well as their structure, internal workings, ecological relationships, and evolution. They learn basic concepts and write about them using the appropriate terminology. Data collecting, analysis, and interpretation are also practiced.

Distribution: MR

Offered: spring semester

Three class hours, three-hour lab.

Formerly BIO 301.

Laboratory fees \$100.

### **BIO 203 - Microbiology (4 cr.)**

Prerequisite: BIO 107, BIO 117, and CHEM 106.

This is an introduction to bacteria and viruses, and the techniques for working with bacteria and viruses, including their isolation, identification, and enumeration.

Distribution: MR

Offered: spring semester

Three class hours, three hour lab.

This course is a prerequisite.

Formerly BIO 303 and BIO 313.

Laboratory fees \$100.

### **BIO 211 - Animal Behavior (3 cr.)**

Prerequisite: BIO 108 and CHEM 106

This course will introduce students to the field of animal behavior. We will examine basic principles derived from evolution, ecology, ethology and development and use these principles to explain how and why animals behave as they do in particular situations. We will focus on many important biological activities such as foraging, communication, migration, predator-prey interactions, mating, and parental care. The central unifying theory for ethology is the same as that for biology itself, namely evolutionary theory. In this class we will use evolutionary theory and what is known of evolutionary history as a context for all of our treatments of animal behavior.

Offered: fall semester

**BIO 213 - Ecology (3 cr.)**

Prerequisite: BIO 107, BIO 117, and at least sophomore standing; CHEM 105 or concurrently.

This is a study of the interaction of plants and animals and their relationship to the physical environment. Such topics as population dynamics, food chains, energy flow, and adaptations are included.

Distribution: MR

Offered: fall semester

Three class hours.

3 to 4 crs Fall'11. back to 3 crs Fall'14.

**BIO 215 - Anatomy and Physiology I (4 cr.)**

Prerequisite: BIO 108/BIO 118 and CHEM 106.

This course offers a comprehensive study of human anatomy and physiology at the cell, tissue, and organ system levels of organization. Topics include anatomical terminology, the basic chemistry of life, structure and function of human cells and tissues, and the anatomy and physiology of integumentary, skeletal, muscular, nervous, and endocrine systems.

Distribution: MR

Offered: fall semester

Three class hours, three-hour lab.

This course is a prerequisite.

Laboratory fee \$100.

**BIO 216 - Anatomy and Physiology II (4 cr.)**

Prerequisite: BIO 215.

A continuation of BIO 215, this course includes a study of the structure and function of the cardiovascular, immune, digestive, respiratory, urinary, and reproductive systems.

Distribution: MR

Offered: spring semester

Three class hours, three-hour lab.

This course is a prerequisite.

Laboratory fee \$100.

**BIO 240 - Research Projects in Biology (1-3 cr.)**

Prerequisite: CHEM 106, BIO 108/BIO 118, sophomore standing, a minimum GPA of 3.30 in the BIO major, and permission of the instructor.

These courses provide students with an opportunity to explore, in the laboratory, topics that go beyond what is normally covered in their coursework as well as help develop good laboratory and research skills.

**BIO 241 - Research Projects in Biology (1-3 cr.)**

Prerequisite: CHEM 106, BIO 108/BIO 118, sophomore standing, a minimum GPA of 3.30 in the BIO major, and permission of the instructor.

These courses provide students with an opportunity to explore, in the laboratory, topics that go beyond what is normally covered in their

coursework as well as help develop good laboratory and research skills.

**BIO 290 - Special Topics in Biology (1-3 cr.)**

Prerequisite: Sophomore standing.

Topics in biology that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies

Distribution: MR

**BIO 306 - Genetics (4 cr.)**

Prerequisite: BIO 107, BIO 117 and CHEM 210.

A study of classical organismal heredity and its molecular basis. Topics will include Mendelian principles, gene structure and function, and changes in genetic material.

Distribution: MR

Offered: fall semester

Three class hours, three-hour lab.

Laboratory fees \$100.

**BIO 310 - Cell Biology (4 cr.)**

Prerequisite: BIO 107, BIO 117 and CHEM 210, Senior standing or permission by Chair.

Students examine cellular structure and function including the molecular organization of the various cell organelles. They learn basic concepts and write about them using the appropriate terminology. An oral presentation is also required of every student. Data collecting, analysis, and interpretation are practiced in the laboratory.

Distribution: MR

Offered: in the spring semester.

Three class hours, three-hour lab.

Laboratory fees \$100.

**BIO 312 - Developmental Biology (4 cr.)**

Prerequisite: BIO 108; CHEM 106 and junior standing.

Students examine the embryonic development of animals and its genetic control. They learn basic concepts and write about them using the appropriate terminology. Students practice the manipulation of sea urchin, salamander, and chicken embryos in the laboratory.

Offered: occasionally

Three class hours, three-hour lab.

Laboratory fees \$100.

**BIO 320 - Principles of Biochemistry (3 cr.)**

Prerequisite: BIO 107; CHEM 210

This lecture-based course is an examination of the chemistry of biological systems with emphasis on human biochemistry. Topics include the biosynthesis; metabolism; and function of proteins, nucleic acids, carbohydrates, and lipids.

Offered: spring semester

**BIO 333 - Independent Study in Biology (1-3 cr.)**

See "Independent Study".

Laboratory fees may be required.

### **BIO 334 - Independent Study in Biology (1-3 cr.)**

See "Independent Study".

Laboratory fees may be required.

### **BIO 340 - Research Projects in Biology (1-3 cr.)**

Prerequisite: CHEM 210/CHEM 220, BIO 201, BIO 213, junior standing, a minimum GPA of 3.30, in the BIO major and permission of the instructor.

Research Project courses provide students with an opportunity to explore, in the laboratory, topics that go beyond what is normally covered in their coursework as well as help develop good laboratory and research skills. May be a continuation of BIO 240-BIO 241.

### **BIO 341 - Research Projects in Biology (1-3 cr.)**

Prerequisite: CHEM 210/CHEM 220, BIO 201, BIO 213, junior standing, a minimum GPA of 3.30, in the BIO major and permission of the instructor.

Research Project courses provide students with an opportunity to explore, in the laboratory, topics that go beyond what is normally covered in their coursework as well as help develop good laboratory and research skills. May be a continuation of BIO 240-BIO 241.

### **BIO 390-391 - Special Topics in Biology (1-3 cr.)**

Members of the biology faculty offer selected topics in their areas of specialty. These courses are not offered on a regular basis and may be repeated for credit if the topic differs.

Laboratory fees may be required.

### **BIO 401 - Molecular Biology (4 cr.)**

Prerequisite: BIO 306 or concurrently.

This course introduces the techniques and tools of isolating DNA, use of recombinant DNA techniques to move genes, to recognize genes, to understand the sequencing of DNA, and the use of bioinformatics to compare genetic sequences.

Distribution: MR

Offered: fall semester

Three lecture hours and three-hour lab.

From 3 crs to 4 crs Fall'17.

Formerly Recombinant DNA/Fingerprinting

Laboratory fee \$100.

### **BIO 440 - Undergraduate Research (1-3 cr.)**

Prerequisite: Senior standing.

See "Undergraduate Research".

Laboratory fees may be required.

### **BIO 441 - Undergraduate Research (1-3 cr.)**

Prerequisite: BIO 440 and Senior standing.

See "Undergraduate Research".

Laboratory fees may be required.

### **BIO 455 - Evolution (3 cr.)**

Prerequisite: BIO 306 and senior standing.

This is a study of organic evolution and its theoretical basis. This course develops three major themes: the history of evolutionary thought, the mechanisms of evolution, and highlights in the history of life.

Offered: spring semester

### **BIO 470 - Seminar in Biology (1 cr.)**

Prerequisite: BIO 306, or instructor permission.

This seminar is intended as a capstone experience for biology majors. Students will read, discuss, and present articles from the primary literature related to a particular theme in biology.

### **BIO 480 - Internship in Biology (3 cr.)**

See "Internships".

### **BIO 481 - Internship in Biology (3 cr.)**

See "Internships".

### **BIO 490 - Special Topics in Biology (1-3 cr.)**

Members of the biology faculty offer selected topics in their areas of specialty. These courses are not offered on a regular basis and may be repeated for credit if the topic differs.

Laboratory fees may be required.

## **BIS - BUSINESS INFORMATION SYSTEMS**

### **BIS 102 - Problem Solving with Business Tools (3 cr.)**

This is a hands-on course on business problem solving. The tools used are a spreadsheet and a database software. The objective of the first part of the course is to practice creating spreadsheet models. Applications are designed using built-in functions with special emphasis on financial functions. Charting concepts are introduced as presentation tools. Other skills include: working with Pivot tables, goal-seeking and what-if modeling. The second part of the course is an introduction to DBMS with emphasis on using and developing database applications for a business context. Topics include: Table design, Query design, Reports and Forms design. This course also includes the basics of Business Analytics.

Distribution: BUSR

This course is a prerequisite.

### **BIS 202 - Introduction to Business Information Systems (3 cr.)**

Prerequisite: BIS 102 or CS 131 and minimum of sophomore standing.

This course is an introduction to Information Systems as a discipline including a survey and overview of the role and functions of IS in a business organization, IS job functions and career paths, and the nature and vocabulary of major information technologies. The course explores the role of IS in advancing the digital economy and as a competitive tool for business. The course includes hands-on work with SAP software to show the relationships between the different business functions. Hands-on work includes: navigation with SAP

GUI, executing transactions, using Master Data (MD), and organizational elements.

Distribution: BUSR

This course is a prerequisite.

This course satisfies the SAP Certificate requirement.

Laboratory fee \$100.

### **BIS 221 - Statistics for Business Analytics (3 cr.)**

Prerequisite: BIS 102 and QR 112 or MATH 120

This course will focus on the business analytics process. Topics will include problem definition, data preparation and statistical analysis. The course builds on descriptive statistics and probability topics taught in the QR 112. Students will learn how to design and conduct a statistical study, how to analyze collected data, as well as how to interpret and communicate the outcomes. Specific statistical methods taught include: estimation of population parameters, hypothesis testing for single and multiple parameters, regression analysis, decision analysis, and forecasting methods. A spreadsheet program and a professional statistical package are utilized.

Distribution: BUSR

This course is a prerequisite.

Formerly "Statistics for Business Analytics", and "Statistics for Business Analysis"

### **BIS 230 - Business Analytics Theory & Practice (3 cr.)**

Prerequisite: BIS 221

This course will make a theoretical and practical introduction to decision theory, decision support systems, and business intelligence by exploring a wide range of business analytics tools and processes used to manage structured and unstructured data, make fact based decision, and solve complex business problems.

Distribution: MR

Offered: Fall only

This course is a prerequisite.

### **BIS 310 - Quality and Operations Management (3 cr.)**

Prerequisite: MAN 101/HONB 101 or MAN 204/HONB 204; MK 200/HONB 200; AC 202; BIS 202; BIS 221; FIN 214

This is the second quantitative methods course. Topics covered include: supply chain management, benchmarking, forecasting methods, inventory management, MRP, SPC, design of experiments, project management, Six Sigma methodology and linear programming. These topics are covered from the perspective of quality management and process improvement.

Distribution: BUSR

This course is a prerequisite.

Cannot take both BIS 310 and BIS 312 for credit.

### **BIS 312 - Quality and Operations Management with SAP (3 cr.)**

Prerequisite: MAN 101/HONB 101 or MAN 204/HONB 204; MK 200/HONB 200; AC 202; BIS 202; BIS 220/BIS 221

This is the second quantitative methods course. Topics covered include: supply chain management, benchmarking, forecasting methods, inventory management, MRP, SPC, project management, six sigma methodology and linear programming. This course includes introductory hands-on implementation of supply chain and project management in SAP. These topics are covered from the perspective of qualitative management and process improvement.

Distribution: BUSR

This course is a prerequisite.

This course satisfies the SAP certificate requirement.

Cannot take both BIS 310 and BIS 312 for credit.

### **BIS 315 - Data Science with Python (3 cr.)**

Prerequisite: BIS 221 or equivalent

This course starts with learning fundamentals of programming in Python. Students learn how to develop data processing applications, using standard data and control structures, input/output procedures, as well as built and user-defined functions. Next, the students learn how to solve business analytics problems with open-source Python packages. Learning cases are selected from Statistics and Management Science, including Big Data scenarios. They incorporate techniques applied to data visualization, inferences about statistical measures, predictive analytics, machine learning and optimization. The students develop projects in team settings.

Distribution: BUSR

Formerly "Data Science with Python and R"

### **BIS 321 - Database Management Systems (3 cr.)**

Prerequisite: BIS 202 and BIS 221 or IT 102 or CS 102.

Cross-Listed as: IT 300

Organizations increasingly rely on computerized database management as databases are an essential component of major information systems. This course provides students with an introduction to the analysis, design and implementation of relational databases. Students are introduced to the fundamental concepts and principles of database management, and gain practical experience by designing and deploying a database using a major DBMS.

Distribution: MR

Offered: Fall only

This course is a prerequisite.

### **BIS 325 - Data Analysis with R (3 cr.)**

Prerequisite: BIS 321 or equivalent

This course starts with an introduction to language R. Students learn basic data and object types, programming statements and control structures, as well as the use of R libraries. Next, the students learn how to apply exploratory data analysis tools, using frequency and contingency tables, charts, summary measures, and dealing with data quality assurance. Finally, the students delve into the real power of R. They develop applications, using hypothesis testing, and model based methods—both analytic and simulation driven. The students will work in teams on data analysis projects, one of which will deal with Big Data, utilizing R and an SQL database system.

Distribution: MR

**BIS 330 - Applied Data Mining (3 cr.)**

Prerequisite: BIS 230

This course introduces students to the various tools, methods and processes used to analyze data and summarize it into useful information. Students will be able to extract raw data, analyze large data sets to discover existing or previously unknown behavior patterns and trends, and finally transform it into a useful format for managerial decisions.

Distribution: MR

Offered: Spring only

This course is a prerequisite.

**BIS 333 - Independent Study in Business Analytics and Information Management (1-3 cr.)**

See "Independent Study".

Laboratory fees may be required.

**BIS 334 - Independent Study in Business Analytics and Information Management (1-3 cr.)**

See "Independent Study".

Laboratory fees may be required.

**BIS 336 - Supply Chain Management Systems (3 cr.)**

Prerequisite: MK 200/HONB 200, BIS 202, BIS 221

This is a study of physical distribution functions and their relationships within an organization. Case studies and readings are utilized to study elements of distribution other than transportation: inventory control, warehousing and distribution centers, customer service, materials handling, industrial packaging, and international distribution. A quantitative analysis approach is emphasized.

Formerly "Logistics/Physical Distribution"

**BIS 340 - Enterprise Resource Planning Systems (3 cr.)**

Prerequisite: BIS 202

This course explores the interaction between operational processes and information systems in the context of Enterprise Resource Systems such as SAP. The course provides a system selection-to-implementation view of ERP systems. Upon completion of this course, students will have a deeper understanding of the evolution of ERP systems, software design, software selection and implementation issues.

**BIS 350 - Information Security (3 cr.)**

Prerequisite: BIS 321.

This course provides an overview of the concepts, principles and practice for information security as well as the threats to the security of information systems. Topics include encryption and decryption, public key infrastructure, digital signature, authentication, access control, network security, e-commerce security.

**BIS 390-391 - Special Topics in Business Information Systems (3 cr.)**

Prerequisite: Junior in BIS or permission of the instructor.

Topics offered depend upon student interests as well as particular interests of instructors. This course is offered as often as faculty time

and student interest permit and may be repeated for credit if the topic differs.

Laboratory fees may be required.

**BIS 412 - Business Analytics with SAP (3 cr.)**

Prerequisite: BIS 202

This course introduces the language of Business Analytics (BA) and Business Information Warehousing. Students gain hands-on experience working with BW in SAP. Students create a Data Warehousing solution using major building blocks of SAP BW. Students execute a complete ETL cycle. Queries are designed in Eclipse/BW Modelling Tools which are used for analysis and reporting. Several stand-alone SAP tools, such as SAP Business Objects Analysis for MS Excel, Crystal reports, SAP Dashboard Designer and SAP Lumira, and SAP Predictive Analytics are introduced for reporting, visual analytics and predictive analytics.

Distribution: MR

Offered: Fall and Spring

This course satisfies the SAP certificate requirement.

Formerly "Business Intelligence with SAP"

**BIS 413 - Data Communications and Networks (3 cr.)**

Prerequisite: IT 102 or CS 102 or BIS 202

Cross-Listed as: IT 250

This course provides an overview of the concepts and principles of telecommunications systems and networks, blending technical with managerial topics. It also provides coverage of major operating systems including Microsoft Windows, Linux. Students will examine network architectures, data communications software and hardware, as well as the array of facilities and resources available on the Internet. Students will complete a series of hands-on network projects, and will analyze network design cases throughout the semester. Students may sit for network certification following completion of the course.

Distribution: MR

**BIS 417 - Systems Analysis and Design (3 cr.)**

Prerequisite: BIS 202

Corequisite: BIS 321

This is an introduction to the systems development life cycle with emphasis on the analysis and design phases. Structured methodologies utilizing CASE tools, as well as prototyping techniques, are covered. A substantial analysis and design project is required.

Distribution: MR

**BIS 445 - Business Analytics Project (3 cr.)**

Prerequisite: BIS 230 and BIS 330

This course provides students with an integrated environment for predictive and descriptive modeling, experimental design, data mining, forecasting, optimization, and text analytics. Students are provided with a range of techniques and processes for the collection, classification, analysis and interpretation of data to reveal anomalies, behavior patterns and trends, new insights, and key variables and relationships.

Distribution: MR

Offered: Fall only



This course is a prerequisite.

### **BIS 450 - Multivariate & Big Data Analysis (3 cr.)**

Prerequisite: BIS 230

This course introduces students to a set of techniques, tools, and models designed to analyze data sets with more than one variable. Student will be able to analyze both categorical and quantitative data sets with multiple factors to predict outcomes based on prior information.

Some multivariate analyses methods employed in this course include Analysis of Covariance (ANCOVA), Multivariate Analysis of Variance (MANOVA); Discriminant Function Analysis (DFA), Multiple Regression (MR), Principal Components/Factor Analysis (PCA/FA), and Reliability and internal consistency Analysis.

Distribution: MR

Offered: Spring only

This course is a prerequisite.

### **BIS 480 - Internship in Business Information Systems (3 cr.)**

See "Internships".

Distribution: MR

### **BIS 481 - Internship in Business Information Systems (3 cr.)**

See "Internships".

Distribution: MR

### **BIS 490 - Special Topics in Business Information Systems (3 cr.)**

Prerequisite: Senior standing in BIS or permission of the instructor.

Topics offered depend upon student interests as well as particular interests of instructors. This course is offered as often as faculty time and student interest permit and may be repeated for credit if the topic differs.

Laboratory fees may be required.

## **BL - BUSINESS LAW**

### **BL 201 - Introduction to Business Law (3 cr.)**

Cross-Listed as: HONB 201

The goal of this course is to identify and distinguish the different aspects of the State and Federal Court System, as well as alternative dispute resolution options; identify legal issues and apply legal principles related to the following areas of law: torts, negligence, defamation, and contracts. Key learning outcomes for these areas of law include students' ability to communicate the positions of the parties to a legal conflict; differentiate between the boundaries of law, ethics and sound business decision-making; and apply legal analysis in planning and decision-making to avoid legal conflicts in business decisions.

Distribution: BUSR

### **BL 308 - Labor Management Relations (3 cr.)**

Prerequisite: Junior Standing.

The course explores the elements associated with the formalized relationship between labor and management with particular emphasis on the collective bargaining framework. Key learning outcomes focus on the understanding, recognition, and application of concepts associated with workplace factors that lead to union organizing; the elements of the organizing process; identification of unfair labor practices; the collective bargaining process, strike mechanisms, and mediation; the arbitration process; and the role of third parties in the labor-management relationship.

Distribution: MR

Cannot take both BL 308 and BL 388 for credit.

### **BL 309 - Business Law Simulation (1 cr.)**

Prerequisite: BL 201/HONB 201

This is a simulation focusing on the legal process and use of alternative dispute resolution (adr). Key learning outcomes include students' ability to apply and use methods of alternative dispute resolution in resolving legal conflicts. This is an experiential course that requires active student participation in role plays and other high involvement roles.

### **BL 350 - Business Law for Arts and Entertainment (3 cr.)**

Prerequisite: AEM 250.

The goal of this course is to identify and distinguish the different aspects of the State and Federal Court System, identify legal issues, and apply legal principles related to torts, and contracts. Specific attention will be given to arts and entertainment law topics such as intellectual property, copyright, First Amendment, representing talent, provenance and authentication. Key learning outcomes for these areas of law include students' ability to apply and use the skills necessary to communicate the positions of the parties to a legal conflict, explain the differentiation between the boundaries of law and ethics in sound business decision making, and apply legal analysis in planning and decision making to avoid legal conflicts in business decisions.

Distribution: BUSR

Cannot take both BL 201/HONB 201 and BL 350 for credit.

### **BL 360 - Business Law for Sport Management (3 cr.)**

Prerequisite: SPMN 250

Open to Sport Management students only. The goal of this course is to identify and distinguish the different aspects of the State and Federal Court System, identify legal issues, and apply legal principles related to torts, and contracts. Specific attention is given to legal issues related to the following areas of sport law: negligence law, anti-trust, defamation, disabilities, trademark, Title IX. Key learning outcomes for these areas of law include students' ability to apply and use the skills necessary to communicate the positions of the parties to a legal conflict, explain the differentiation between the boundaries of law and ethics in sound business decision-making, and apply legal analysis in planning and decision-making to avoid legal conflicts in business decisions.

Distribution: MR

Cannot take BL 201/HONB 201 and BL 360 for credit.

### **BL 388 - Labor Management Relations in Sport (3 cr.)**

Prerequisite: BL 360

Students will acquire an understanding of the various phases of the labor-management relationship generally and in the sports industry. Specifically, this understanding will be achieved through an understanding of historical developments leading to the development of labor-management generally and labor-management relations in sports. In addition, the labor relations process will be studied including the union organizing process, the collective bargaining process, and the administration and interpretation of collective bargaining agreements.

Cannot take both BL 308 and BL 388 for credit.

### **BL 390 - Special Topics in Business Law (3 cr.)**

Prerequisite: Junior in BL or permission of the instructor.

Topics offered depend upon student interests as well as particular interests of instructors. This course is offered as often as faculty time and student interest permit and may be repeated for credit if the topic differs.

### **BL 403 - Business Law for Entrepreneurs (3 cr.)**

Prerequisite: BL 201/HONB 201 and ENTR 251.

This course is designed to give students a familiarity of the various forms of organization and the rights and responsibilities of the officers, employees, and shareholders; taxation of the various organizational forms; patent and other forms of intellectual property issues; contract law particularly as it applies to licensing, leases, employees, and insurance; and ways to mitigate the various forms of risk.

Distribution: MR

### **BL 424 - Business Law for Human Resource Management (3 cr.)**

Prerequisite: BL 201/HONB 201 or BL 360, MAN 323.

The goal of this course is to identify legal issues related to the following areas of human resource law: negligent hiring, employment at-will, race discrimination, sex discrimination (including sexual harassment), and disabilities discrimination. Key learning outcomes for these areas of law include students' ability to apply and use skills necessary to communicate the positions of the parties to a legal conflict, explain the boundaries between law and ethics in sound business decision-making, and apply legal analysis in planning and decision-making to avoid legal conflicts in business decisions.

Distribution: MR

## **BME - BIOMEDICAL ENGINEERING**

### **BME 201 - Foundations of Biomedical Engineering (3 cr.)**

Corequisite: or Prerequisite: ENGR 103, PHYS 134, and CHEM 105.

This sophomore level course introduces the students to fundamental concepts in the field of biomedical engineering including engineering calculations and an in-depth study on conservation principles, in particular, conservation of mass, energy, and charge. The course introduces students to the concept of mathematical modeling of biological and physiological systems.

Distribution: MR

### **BME 202 - Biomedical Systems (3 cr.)**

Prerequisite: BME 201, EE 205/HONE 205, MATH 236

This sophomore level course introduces the students to concepts in systems theory as it relates to biomedical systems. Topics covered include time domain, Laplace domain, and Fourier domain analysis of systems, including impulse response, step response and system stability. Relevant physiological systems will be introduced and serve as a primer for deeper study of physiological systems in the junior year. The course will rely heavily on computer simulation.

Distribution: MR

### **BME 206 - Biomedical Sophomore Laboratory (1 cr.)**

Corequisite: BME 202 and BME 240

This laboratory course will allow students to apply the concepts learned in courses to the real world. Experiments include reaction time, mechanical testing of materials, and 1st and 2nd order mechanical and electrical systems.

Distribution: MR

### **BME 210 - Introduction to Biomedical Engineering Research (1-3 cr.)**

Prerequisite: ENGR 103 or

Corequisite: ENGR 103.

This course allows first- and second-year biomedical engineering students to perform research with a biomedical engineering faculty member. Students are expected to work three hours per week for each credit hour attempted. Students will present a formal report on their research project at the end of the semester. Note: A maximum of 6 credit hours of research may be applied to complete BME degree requirements

### **BME 240 - Biomaterials (3 cr.)**

Prerequisite: CHEM 105, BME 201 and PHYS 134.

Corequisite: BME 206

This is an introduction to the fundamental concepts of materials science with applications in biomedical engineering. Students analyze physical properties of biomaterials, understand the interaction of the biomaterial with the human body, examine material specifications and fabrication methods, and compare and contrast various materials for an application.

Distribution: MR

Formerly BME 340

### **BME 290-292 - Special Topics in Bioengineering (3 cr.)**

This is a study of an advanced topic in bioengineering of special interest to engineering majors, but not offered on a regular basis.

### **BME 301 - Engineering Physiology I (3 cr.)**

Prerequisite: MATH 350 or concurrently.

Corequisite: BME 305.

This course combines the study of physiology, anatomy, and engineering. Students gain an in-depth understanding of specified physiological systems and additionally study appropriate engineering models and concepts associated with the various systems. The systems covered include introduction to cell physiology, skeletal and smooth muscle, blood, circulatory system, and immunology.

Distribution: MR

### **BME 302 - Engineering Physiology II (3 cr.)**

Prerequisite: BME 202, BME 301 and BME 305.

Corequisite: Corequisite BME 306.

This is the second of a two-part course that combines the study of physiology, anatomy, and engineering. Students gain an in-depth understanding of specified physiological systems and additionally study appropriate engineering models and concepts associated with the various systems. The topics covered include neurophysiology, cardiovascular physiology, respiratory system, renal system, and gastrointestinal system.

Distribution: MR

### **BME 305 - Biomedical Engineering Laboratory I (1 cr.)**

Prerequisite: IE 212 or

Corequisite: BME 331; IE 212

This laboratory will allow the student to apply the concepts learned in the classroom to the real world. Experiments and exercises will be relevant to and augment the topics covered in the classroom. Topics include data acquisition, amplifiers and filters, electromyography (EMG), electrocardiography (ECG), thermodilution, and ultrasound.

Distribution: MR

### **BME 306 - Biomedical Engineering Laboratory II (1 cr.)**

Corequisite: BME 302 and BME 351

This laboratory will allow the student to apply the concepts learned in the classroom to the real world. Experiments and exercises will be relevant to and augment the topics covered in the classroom. Topics include viscometry, hemorheology, enzyme immunosorbent assay (EIA), mechanical testing of materials, biomechanics, ethics, humans as research subjects, animals as research subjects, and contemporary research in biomedical engineering.

Distribution: MR

### **BME 331 - Bioinstrumentation (3 cr.)**

Prerequisite: BME 202, EE 205/HONE 205

Corequisite: BME 305

This course introduces students to the principles and techniques of acquiring data from the human body. Topics include measurement terminology, conversion of analog and digital signals, transduction, sensors, and medical imaging. Students will learn how to measure a wide variety of physiologically relevant phenomena including: temperature, pressure, flow, bioelectric signals, and concentration of biochemical analytes. The design features of instrumentation related to making measurements from physiological systems are explored. Students design, build and validate biomedical amplifier circuits, specify off-the-shelf equipment, and study the latest advances in medical instrumentation.

Distribution: MR

### **BME 332 - Biomedical Imaging (3 cr.)**

Prerequisite: BME 202

Corequisite: or BME 202 concurrently, or permission of the instructor.

This course is a study of the underlying principles associated with medical imaging systems. Several medical imaging modalities will be

studied including: x-ray, computed tomography, ultrasound, magnetic resonance imaging, and nuclear imaging. Topics will focus on clinical applications of the technology.

### **BME 335 - Medical Image Processing (3 cr.)**

Prerequisite: ENGR 105/HONE 105, EE 205/HONE 205, and at least junior standing

This course introduces students to the fundamental processes and algorithms implemented as standard image processing techniques. The image analysis performed in the course will utilize only digital images and primarily grayscale images. The focus of the course is on medical image processing applications. Topics covered include spatial resolution and spatial frequency, image histograms, spatial filtering and image segmentation.

### **BME 342 - Drug Delivery (3 cr.)**

Prerequisite: BME 240

This course will introduce students to the concept of drug delivery systems that provide pharmaceutical agents at target tissues, the mechanism of pharmacokinetic regulation, the basics, technology, and applications of drug delivery systems. The emphasis is on understanding the principles of pharmacokinetics and drug delivery systems to improve clinical efficacy as well as to reduce side effects and on realizing the importance of the field, drug delivery. The course will be taught through traditional didactic lectures (60%), laboratory modules, article discussions and class presentations.

Distribution: MR

### **BME 351 - Biomechanics I (3 cr.)**

Prerequisite: MATH 134 and PHYS 133

Corequisite: BME 306

This course will introduce biomedical engineering students to statics and strength of materials related to the human body. Topics include musculoskeletal anatomy, force and moment vectors, statics of various joints, stress and strain, tension, compression, torsion, bending, combined loading, and material properties of biological tissues such as bone, tendons, ligaments, and articular cartilage.

Distribution: MR

Formerly BME 251

### **BME 380 - Biomedical Engineering Practicum (3 cr.)**

Prerequisite: Junior standing and permission of instructor.

Projects in which engineering analysis and design are applied to practical engineering problems in the rehabilitation, instrumentation, biological, or medical fields. A written plan at the time of registration and a final oral and written report are required.

### **BME 390 - Special Topics in Bioengineering (3 cr.)**

This is a study of an advanced topic in bioengineering of special interest to engineering majors, but not offered on a regular basis.

### **BME 405 - Biomedical Engineering Senior Laboratory (1 cr.)**

Corequisite: BME 451

This senior level course is designed to foster independent thinking in the laboratory. Students will conduct experiments on living systems.

Students will also develop fundamental skills in designing experiments.

Distribution: MR

### **BME 410 - Biomedical Engineering Research (1-3 cr.)**

Prerequisite: Junior or Senior Standing

This course allows third- and fourth-year biomedical engineering students to perform research with a biomedical engineering faculty member. Students are expected to work three hours per week for each credit hour attempted. Students will present a formal report on their research project at the end of the semester. Note: A maximum of 6 credit hours of research may be applied to complete BME degree requirements

### **BME 423 - Product Development and Innovation (3 cr.)**

Prerequisite: Junior standing in engineering.

Cross-Listed as: BME 471, BUS 423 and ME 423

This course will cover new product innovation from both an entrepreneurship and intrapreneurship perspective. Students will learn about generating and identifying business opportunities, assessing concept ideas from technical, market, and financial perspectives; designing and developing new products; testing prototypes from technical and market perspectives; and developing a marketing plan including launch, monitoring, and measurement provisions. Interdisciplinary teams of business and engineering students will apply these principles to develop product concepts, prototype products, final designs, and marketing plans for a new consumer or business product. The final designs and plans will be presented to an expert panel of business executives, investors, and faculty.

Formerly BME 471.

Cannot receive credit for taking BME 471, BUS 423 and ME 423.

### **BME 425 - Prosthetic and Orthotic Devices (3 cr.)**

Prerequisite: BME 301 or BIO 215

Corequisite: BME 301 or BIO 215

This course will apply concepts in physiology, anatomy and biomechanics to the understanding of prosthetic and orthotic devices. The students will be introduced to the components of normal and pathological gait mechanical loading through assistive devices and understand unique challenges in dealing with patient care. The normal mechanics of gait are the basis for the biomechanical assessment of the foot and ankle and patient management for orthotic and prosthetic prescription and device training. Students will learn career requirements for practicing as a CPO in the field and will be exposed to body-powered devices as well as the biofeedback devices prescribed for patients with lower- and upper-limb deficiencies.

### **BME 431 - Advanced Bioinstrumentation (3 cr.)**

Prerequisite: BME 331 and BME 302 or

Corequisite: BME 302

This course is a study of practical aspects of designing instrumentation for biomedical applications. The course will include topics such as semiconductor devices and applications, nonideal amplifiers and filters, noise in electrical circuits, data acquisition

principles, and regulatory requirements. Students will learn to design and validate subsystems, focusing on critical performance parameters and the limitations of the devices for practical use.

### **BME 432 - Lab on a Chip (3 cr.)**

Prerequisite: CHEM 105 and EE 205/HONE 205, or permission of the instructor.

This course studies the design, development, and application of Lab on a Chip systems in the biomedical and life sciences. Topics include fundamentals of miniaturization, microfluidics, sensors, fabrication, packaging, and system integration. Students will review current applications of miniaturized chemical/biological analysis systems and will investigate case studies through the preparation of a term paper and oral presentation. Students will also design a basic microfluidic system that will be implemented in a hands-on laboratory project.

### **BME 434 - Biosensors, BioMEMS, and Nanomedicine (3 cr.)**

Prerequisite: CHEM 105 and EE 205/HONE 205, or permission of the instructor.

This course studies the development and application of micro and nanotechnologies in medicine. Topics include biosensors, transduction mechanisms, and fundamentals of bio-microelectromechanical systems (BioMEMS). Recent progress in nano-scale sensors and systems will also be explored, including nanoparticle-based systems for targeted therapy, drug-delivery, and nanobiosensors.

### **BME 437 - Senior Design Projects I (3 cr.)**

Prerequisite: Senior standing.

Working under the supervision of the biomedical engineering faculty, students select a capstone design project, thoroughly research solutions, and undergo formal design reviews. Students will learn and apply fundamental project management techniques to their projects. They are encouraged to work on clinically or industry relevant projects. The students will undergo formal design reviews with faculty, clinical, or industrial sponsors, and other students. Students are assessed with progress reports, design reviews, and the creation of a design history file. The project will be continued in BME 440 in the subsequent semester.

Distribution: MR

### **BME 440 - Senior Design Projects II (3 cr.)**

Prerequisite: BME 437.

Working under the supervision of biomedical engineering faculty and project advisors, students complete the work on a capstone project that was proposed in BME 437. Students organize formal design reviews with faculty, other students, and industrial sponsors. Students are assessed with weekly progress reports, design reviews, a final written report, and an oral defense of the project. Additionally, students will prepare and submit a technical paper for external dissemination of their project results to a regional biomedical engineering conference.

Distribution: MR

Credits changed from 4 crs to 3 crs as of Fall'19.

### **BME 443 - Advanced Biomedical Materials and Medical Devices (3 cr.)**

Prerequisite: BME 240/BME 340 or ME 309.

This course is designed to explore the field of biomaterials and medical devices. The basic science of metals, ceramics, polymers and biological materials used in medical and dental applications will be presented. Major concepts will focus on structure-property relationships and the physical and mechanical properties of these important classes of materials. Other topics will include modes of materials degradation and failure, including metallic corrosion, wear and fretting, and polymer degradation. Issues related to the biocompatibility of materials and the performance of medical devices will be presented. An emphasis is placed on surface and interfacial properties of biomaterials and the biological response of the human body to the presence of artificial materials. Examples of specific implants and medical devices will be presented and studied both through lecture materials and group projects.

### **BME 450 - Biotransport Processes (3 cr.)**

Prerequisite: CHEM 106, MATH 236, and BME 301.

Cellular transport and electrical properties from a combined biological, physical, and engineering point of view. Matter transport across cellular membranes involving diffusion, osmosis, coupled solute and solvent transport, carrier-mediated transport, and ion transport. Homeostatic mechanisms involved in maintaining cellular solute concentrations, volume, and potential. Electrically inexcitable and excitable cells, lumped parameter and distributed-parameter cell models, linear electric properties of cells, and voltage gated ion channels.

Distribution: MR

Formerly BME 350 Biomedical Thermal Systems

### **BME 451 - Biomechanics II (3 cr.)**

Corequisite: BME 405

This course will introduce biomedical engineering students to the dynamics of the human body. Topics include musculoskeletal dynamics, kinematics and kinetics of rigid bodies, and anthropometry.

Distribution: MR

### **BME 460 - Cell and Tissue Engineering (3 cr.)**

Corequisite: BME 302 and BME 306, or permission of the instructor.

This course will cover principles behind the rapidly advancing field of cell and tissue engineering. Topics include the culture of mammalian cells, the role of mechanical forces in cellular processes, and biomaterial-cell interactions. Example of the development of tissue-engineered devices for the replacement of blood vessels and heart valves, liver, kidney, and bone and cartilage will be studied.

### **BME 480 - Internship in Biomedical Engineering (3 cr.)**

See "Internships".

### **BME 490-493 - Special Topics in Biomedical Engineering (3 cr.)**

This is a study of an advanced topic in bioengineering of special interest to engineering majors, but not offered on a regular basis.

## **BUS - BUSINESS**

### **BUS 110 - Introduction to Business Seminar (3 cr.)**

This is a course designed specifically for students new to the study of business in a university setting. Students will have the opportunity to develop their business vocabulary and advance critical and analytical thinking skills for addressing business issues. Students will be introduced to concepts associated with the core business functions of marketing, management, finance, accounting, human resources, and information systems. A component of the course focuses on personal and professional development through the acquisition of skills in time management, oral presentations, working in teams, information literacy and career choice. There is a high level of interaction with faculty and peers both inside and outside the classroom.

Distribution: BUSR/GUR

Formerly BUS 101 "First Year Business Seminar"

### **BUS 190-191 - Special Topics in Business (3 cr.)**

This is a study of topics in business that are not offered on a regular basis.

### **BUS 210 - Living and Learning Abroad (1 cr.)**

This course focuses on intercultural concepts and skills necessary for students to maximize study abroad experience. Readings, online class discussions, and course activities take place prior to or concurrent with the semester abroad. Topics include: country shock and culture shock, values and culture, educational culture, stereotypes and generalizations, intercultural communication, global and self-awareness, empathy, perspective shifting, and re-entry.

### **BUS 211 - Developing Intercultural Competence (2 cr.)**

Prerequisite: BUS 210

This course builds upon work undertaken in BUS 210 and during the study abroad experience by continuing to focus on strategies for developing intercultural competence. Readings, activities and discussions emphasize the concept of culture and the nature of intercultural competence, the relevance of intercultural competence to contemporary business, and the design of an individual intercultural competence development plan.

Lab Fee \$20

### **BUS 290-294 - Special Topics in Business (3 cr.)**

This is a study of topics in business that are not offered on a regular basis.

### **BUS 312 - Business Processes and Enterprise Resource Planning with SAP (3 cr.)**

Prerequisite: AC 202, BIS 202, BIS 221, BL 201/HONB 201/BL 350/BL360, FIN 214, MAN 204/HONB 204; MK 200/HONB 200

Cross-Listed as: HONB 312

This course provides the intermediate integrative framework between BUS 101 and BUS 450. It does so by using SAP ERP application

software. Each student establishes a virtual business by configuring SAP to create the needed organizational elements and the Master Data. Students execute transactions for the procurement and sales cycles. Through these business process implementations students learn integration of core business functions at the operations level. Students are taught business process design concepts and vocabulary which can be implemented in any ERP system.

This course satisfies the SAP Certificate requirement.

Offered: in fall and spring.

### **BUS 315 - International Practicum (3 cr.)**

Prerequisite: Sophomore standing and consent of instructor.

Cross-Listed as: CUL 315

International Practicum involves pre-travel and/or post-travel study and travel of 10-14 days duration during school breaks that are chaperoned and supervised by a business faculty member. These trips take students outside the geographic borders of the U.S. and provide learning experiences beyond the classroom environment. Programs and activities enhance the ability of students to comprehend, analyze, and grasp different cultural aspects that impact successful management of organizations in the global work environment. The major goal of the International Practicum is to allow undergraduate students opportunities to enhance their understanding of cross-cultural differences and the globalization of the work environment.

The course may be repeated for credit if the location/topic varies.

### **BUS 326 - Business Planning for New Ventures (3 cr.)**

Prerequisite: AC 202, BIS 202, BIS 221, BL 201/BL 360/BL 350/HONB 201, FIN 214, or MAN 204/HONB 204, & MK 200/HONB 200.

The course provides an intermediate integrative framework in the business curriculum for continued development of analytical and decision-making skills in the business environment. Focused on the development of a new business venture or a new product in an established firm, the course integrates core concepts from each functional area covered in introductory coursework as a means of understanding the dynamic interplay between functional areas. Students will develop a full business plan as an element of course pedagogy. Established learning outcomes include: understanding the principal elements of a business plan, describing the process of business plan development, recognizing the impact of a proposed product or venture on functional areas of a firm.

Offered: in fall and spring.

### **BUS 333-334 - Independent Study in Business (1-3 cr.)**

See "Independent Study".

Laboratory fees may be required.

### **BUS 350 - Business Etiquette and Professionalism (3 cr.)**

Prerequisite: Junior Standing.

This course is designed to introduce students to elements of culture and behavior in a professional atmosphere that contribute to personal and professional success. Students will examine a variety of professional customs including communication norms, behavioral expectations, and professional appearance. In addition, students will

be introduced to different norms for these areas in international settings.

Offered: in spring, odd years.

This course satisfies the Remote Work Certificate requirement.

\$25 Lab Fee.

### **BUS 361 - Industry Studies: Resort, Gaming, Hospitality (3 cr.)**

Prerequisite: MAN 101/HONB 101 or MAN 204/HONB 204; MK 200/HONB 200, BL 201/HONB 201, or BL 360, BL 350 and Junior Standing.

This course is focused on the management of resort, gaming, and hospitality operations. This course will introduce students to the tourism industry as they explore the history as well as the current business considerations for the resort, gaming, and hospitality enterprise. Students will learn to apply business and management skills and tools based on regulations, financial requirements, human resource needs, marketing and sales strategies, accounting, and security technological innovations.

### **BUS 364 - Industry Studies: Golf (3 cr.)**

Prerequisite: Junior standing or permission of instructor.

This course is designed to introduce students to the business of the golf industry. Students will explore all aspects of golf operations including management of tournaments, golf manager-professional services, golf shop services, food and beverage, recreation facilities, club amenities, and the golf course/grounds itself. Students will examine golf industry specific business applications including marketing and sales strategies, revenue development, customer service, and the various owner/management work settings in golf. Current and future issues in golf management including environmental impact and sustainability, economic challenges, and technological applications will be explored. Students will also learn about employment requirements and career opportunities in the golf industry.

### **BUS 375 - Non Profit Board Field Experience (1 cr.)**

Prerequisite: Permission of instructor and junior standing in College of Business

This is the first semester of a two semester course sequence. Students must successfully complete BUS 375/BUS 376 in order to earn credit towards graduation. The goal of this two semester course is to provide students with the opportunity to gain exposure to the type of decisions made by nonprofit boards of directors. This involves membership on a board of directors as well as hands-on experience as a member of a subcommittee of the board. During the first semester students will attend board meetings and become oriented to the organization.

### **BUS 376 - Non Profit Board Field Experience (2 cr.)**

Prerequisite: BUS 375. Permission of instructor and junior standing in College of Business

This is the second semester of a two semester course sequence. Students must successfully complete BUS 375/BUS 376 in order to earn credit towards graduation. The goal of this two semester course is to provide students with the opportunity to gain exposure to the type of decisions made by nonprofit boards of directors. This involves membership on a board of directors as well as hands-on experience as a member of a subcommittee of the board. During the

second semester students become involved with a member of the board in a project area.

### **BUS 390-394 - Special Topics in Business (1-3 cr.)**

This is a study of advanced topics in business of special interest to business majors, but not offered on a regular basis.

Distribution: MR

### **BUS 411 - Global Scholars Capstone (2 cr.)**

Prerequisite: Approval of Global Scholars Coordinator.

Global Scholars Capstone Seminar in the senior year includes a Global Scholars presentation to members of the College of Business Advisory Board. This requirement may be aligned with Honors Program and/or major program requirements.

Change from 1 cr. to 2 cr. effective Fall'17 semester.

### **BUS 420 - Business Research (3 cr.)**

Prerequisite: Junior or Senior standing, and approval of instructor.

This course allows third- and fourth-year College of Business students to perform research with a College of Business faculty member. A limited number of qualified undergraduate students (restricted to one student per department per year) may undertake supervised research if they show both interest in and aptitude for independent and creative work. Applications may be made for research in any of the disciplines in which faculty are willing to involve students. When such research is conducted, students must submit written reports for approval by faculty of the department in which the work was conducted. Depending on circumstances, students might be permitted to co-present their research with their faculty supervisor at an appropriate regional academic conference. The supervising faculty member and the department chair must approve grades for such work. Applications to enroll in the undergraduate research course must be made in writing prior to registration. Applications must have the signatures of the student, faculty supervisor, department chair, and dean.

### **BUS 423 - Product Development and Innovation (3 cr.)**

Prerequisite: BUS 312/HONB 312 or BUS 326, and BIS 310 or BIS 312

Cross-Listed as: BME 423/BME 471 and ME 423

This course will cover new product innovation from both an entrepreneurship and intrapreneurship perspective. The course will have three components: a theoretical, a practical or clinical, and an application. The theoretical will consist of generating and identifying business opportunities; assessing concept ideas from technical, market, and financial perspectives; designing and developing new products; testing prototypes from technical and market perspectives; and developing a marketing plan including launch, monitoring, and measurement provisions. The practical or clinical component will consist of business-engineering student teams identifying consumer or business new product ideas of their own, from a faculty-generated list, or from local corporations. Selection of ideas is on the basis of the importance of the need, the novelty, the challenge, and commercialization potential. Teams will develop marketing plan to market their new product designs. The application component will involve presenting the final designs and plans to an expert panel of business executives, investors, and faculty.

Offered: in fall.

Cannot receive credit for taking BME 423/BME 471 and ME 423.

### **BUS 450 - Business Strategy (3 cr.)**

Prerequisite: BUS 312/HONB 312 or BUS 326, and BIS 310 or BIS 312.

Cross-Listed as: HONB 450

The course provides the framework for an overall integration of business perspectives in the development of an organization's strategies. Key learning outcomes include identification of the key elements of the strategic management process, explaining operational and strategic-level decisions, explaining environmental opportunities and threats, explaining a firm's strategic performance through financial statements, making decisions about a firm's chosen strategies, and the application of strategic management theories.

Distribution: BUSR

Offered: in fall and spring.

Cannot be taken concurrently with BUS 312 /HONB 312 or BUS 326

### **BUS 465 - Senior Seminar in General Business (3 cr.)**

Prerequisite: Senior General Business Majors Only

The course provides students with an enhanced understanding of current perspectives in business. The course includes opportunities to apply business knowledge to current business problems and opportunities.

Offered: in spring.

Formerly General Business Capstone

### **BUS 480 - Internship in Business (3 cr.)**

Prerequisite: Must have completed at least 57 credit hours (Junior standing) and have a minimum GPA of 2.5 overall and in the major, except where an internship is required in the major, or obtain special permission of their dean to undertake an internship.

See "Internships".

### **BUS 481 - Internship in Business (1-3 cr.)**

Prerequisite: Must have completed at least 57 credit hours (Junior standing) and have a minimum GPA of 2.5 overall and in the major, except where an internship is required in the major, or obtain special permission of their dean to undertake an internship.

See "Internships".

### **BUS 490-492 - Special Topics in Business (1-3 cr.)**

This is a study of advanced topics in business of special interest to business majors, but not offered on a regular basis.

Distribution: MR

## **CEE - Civil and Environmental Engineering**

### **CEE 240 - Strength of Civil Engineering Materials (3 cr.)**

Prerequisite: or Co-Req: ME 202/HONE 202

This course is designed to provide students with a fundamental understanding of civil engineering materials and their strengths. In the first half of this course, students will learn material properties of metals and alloys, cements, ceramics, concrete, glass, steel, mineral

aggregates, lumber and timber, plastics, and composites. Students will also learn corrosion and material selection process. The second half of this course will focus on stress and strain, bending and torsion of beams, principal and combined stresses, axial and lateral loads, elasticity, and energy principles. Students should concurrently take the laboratory component of this course.

Distribution: MR

### **CEE 242 - Strength of Civil Engineering Laboratory (1 cr.)**

Corequisite: CEE 240

This is the laboratory course accompanying CEE 240. This course will allow students to apply theories and concepts learned in the classroom to hands-on laboratory testing and analysis of civil engineering materials.

Distribution: MR

### **CEE 251 - Surveying (3 cr.)**

Prerequisite: Complete MATH 134 with a minimum grade of "C", and Sophomore, Junior or Senior Standing.

This course is designed to provide students with a fundamental understanding of land surveying. Topics covered in this course include measurement of distances, angles, directions, elevations, and areas. Students will also learn computer aided design (CAD), global positioning system (GPS), and graphical information systems (GIS). Students should concurrently take the laboratory component of this course.

Distribution: MR

### **CEE 253 - Surveying Laboratory (1 cr.)**

Corequisite: CEE 251

This is the laboratory course accompanying CEE 251.

This course will allow students to apply theories and concepts learned in the classroom to hands-on field training using professional surveying equipment.

Distribution: MR

### **CEE 310 - Civil Engineering Research (1-3 cr.)**

Prerequisite: Junior or Senior CEE major

See "Undergraduate Research" in catalogue

Distribution: MR

### **CEE 320 - Environmental Engineering (3 cr.)**

Prerequisite: CEE 361 or ME 316

This course is designed to provide students with a fundamental understanding of environmental engineering. Topics covered in this course include water quality, water and wastewater treatment, solid and hazardous waste management, environmental law and regulations, air pollution, and remediation. A team design project is required. Students should concurrently take the laboratory component of this course.

Distribution: MR

### **CEE 322 - Environmental Engineering Laboratory (1 cr.)**

Corequisite: CEE 320

This is the laboratory course accompanying CEE 320. This course will allow students to apply theories and concepts learned in the classroom to hands-on laboratory training of water and wastewater analysis. This laboratory course also includes hands-on laboratory demonstrations of fundamental concepts in engineering fluid mechanics.

Distribution: MR

### **CEE 324 - Groundwater Engineering (3 cr.)**

Prerequisite: CEE 361 or ME 316

This course is designed to provide students with a fundamental understanding of groundwater engineering. Topics covered in this course include the hydrologic cycle, hydrogeology, unsaturated and saturated flow, confined and unconfined aquifers, well hydraulics, contamination, remediation, solute transport, mathematical modeling, and aquatic chemistry.

Distribution: MR

Offered: every other year

### **CEE 330 - Soil Mechanics (3 cr.)**

Prerequisite: CEE 361 or ME 316 concurrently

The course is designed to provide students with a fundamental understanding of soil behavior. Topics covered in this course include mechanics of soils, composition and classification, compaction and consolidation, shear strength, bearing capacity, stress and strain tensors, seepage, slope stability, retaining walls, and soil testing methods. Students should concurrently take the laboratory component of this course.

Distribution: MR

### **CEE 332 - Soil Mechanics Laboratory (1 cr.)**

Corequisite: CEE 330

This is the laboratory course accompanying CEE 330. This course will allow students to apply theories and concepts learned in the classroom to hands-on laboratory demonstration of soil behavior and training of various soil testing methods.

Distribution: MR

### **CEE 341 - Structural Analysis (3 cr.)**

Prerequisite: CEE 240

This course is designed to provide students with a fundamental understanding of structural analysis with a focus on beams, trusses, and frames. Students will learn to analyze statically indeterminate structures, shear and moment diagrams, influence line diagrams, and vibrations. Student will also learn basic structural analysis using computer software. A team design project is required.

Distribution: MR

### **CEE 342 - Steel & Reinforced Concrete (3 cr.)**

Prerequisite: CEE 341

This course is designed to provide students with a fundamental knowledge of steel design. Topics covered in this course include the design process for beams, columns, frames, trusses, connections, and other structures using the Load and Resistance Factor Design (LRFD)



method.

A team design project is required.

Distribution: MR

Formerly Steel Design.

Formerly Steel & Reinforced Concrete Design.

### **CEE 351 - Transportation Engineering (3 cr.)**

Prerequisite: ME 203

This course is designed to provide students with a fundamental knowledge of steel design. Topics covered in this course include the design process for beams, columns, frames, trusses, connections, and other structures using the Load and Resistance Factor Design (LRFD) method.

A team design project is required.

Distribution: MR

### **CEE 353 - Transportation Engineering Laboratory (1 cr.)**

Corequisite: CEE 351

This is the laboratory course accompanying CEE 351. This course will allow students to apply theories and concepts learned in the classroom to hands-on computer programming, simulations, and analysis of transportation topics.

Distribution: MR

### **CEE 361 - Engineering Fluid Mechanics (3 cr.)**

Prerequisite: MATH 235 or MATH 236

This course is designed to provide students with a fundamental understanding of fluid behavior with an emphasis on liquids. Topics covered include fluid statics and dynamics, laminar and turbulent flow, pressure, forces, energy equation, dimensional analysis, drag, incompressible and compressible flow, energy and hydraulic grade lines, and simple pumps. A team design project is required.

Distribution: MR

### **CEE 370 - Architecture Engineering (3 cr.)**

Prerequisite: Complete CMGT 202 or ME 202.

This course is designed to provide students with a fundamental understanding of architecture history, form and function, interior design, exterior design, graphical representations, architecture technologies, computer applications, blueprints, and structure analysis.

Distribution: MR

Offered: spring semester

### **CEE 390-391 - Special Topics in Civil and Environmental Engineering (1-3 cr.)**

Prerequisite: Junior standing

Topics offered depend on student interests as well as particular interests of instructors. This course may be repeated for credit if the topic varies.

### **CEE 400 - Ethical and Professional Issues (1 cr.)**

Prerequisite: Senior or Junior Standing

This course is designed to provide students with a fundamental understanding of social, ethical, global, and professional issues facing civil and environmental engineers. Topics covered also include case studies of law, contracts, and liability issues.

Distribution: MR

### **CEE 402 - Capstone Design (3 cr.)**

Prerequisite: Senior Standing

This course is designed to provide students a comprehensive civil engineering design experience. Students will learn the entire process of executing a civil engineering project from initial design to project completion. Topics covered also include alternative solutions, cost analysis, and project management. Students are expected to complete a team design project and are expected to present project outcomes in a public setting.

Distribution: MR

### **CEE 406 - Green and Sustainable Civil Engineering (3 cr.)**

Prerequisite: Junior or Senior Standing

This course is designed to provide students with a fundamental understanding of modern green and sustainable technologies available to civil and environmental engineers. Topics covered include life cycle analysis, alternative energy and renewable fuels, building efficiency, sustainable materials, and green building certifications. An individual design project is required.

Distribution: MR

### **CEE 410 - Civil Engineering Research (1-3 cr.)**

Prerequisite: Senior CEE major

See "Undergraduate Research" in catalogue

Distribution: MR

### **CEE 411 - Petroleum Fluids & Reservoir Engineering (3 cr.)**

Prerequisite: or Co-Req: CEE 361

This course is designed to provide students with a fundamental understanding on the chemical and physical behavior of petroleum fluids. Topics include fluid properties, phase behavior, gas-liquid equilibria calculations, mass balance calculations, and types of petroleum reservoir fluids. This course also covers classification of subsurface reservoirs, recovery mechanisms, and steady-state and transient fluid flow in permeable subsurface reservoirs.

Distribution: MR

### **CEE 412 - Petrophysics and Reservoir Geomechanics (3 cr.)**

Corequisite: CEE 330

This course is designed to provide students with a fundamental understanding of petrophysics and reservoir geomechanics. Petrophysics topics include properties of rocks, measurement and interpretation of petrophysical properties, application of petrophysics to subsurface engineering problems, and interaction of resident fluids with rocks. Reservoir geomechanics topics include stress and strain analysis, pore pressure and in-situ stress estimation and measurement, deformation mechanisms in rock, wellbore stresses and failure, depletion-induced reservoir deformation, and hydraulic fracturing.

Distribution: MR

### **CEE 430 - Geotechnical Engineering (3 cr.)**

Prerequisite: CEE 330

This course is designed to provide students with a fundamental understanding of geotechnical engineering. Topics covered in this course include deep and shallow foundations, piles, earth structures, geoenvironmental engineering, groundwater, soil and structure interactions, earthquake engineering, and computer simulations. A team design project is required.

Distribution: MR

### **CEE 451 - Construction Materials (3 cr.)**

Prerequisite: CEE 342 or concurrently

This course is designed to provide students with a fundamental understanding of concrete and pavement designs. Concrete topics covered in this course include prestressed concrete, reinforced concrete, loading and stresses, shear and torsion, deflection, sensors, concrete canoe, and concrete inspection. Pavement topics covered in this course include design and construction, rigid and flexible pavements, loading, drainage, and pavement inspection.

Students should concurrently take the laboratory component of this course.

Distribution: MR

Formerly Concrete and Pavement

### **CEE 455 - Railroad Transportation Engineering (3 cr.)**

Prerequisite: ME 203

This course is designed to provide students with a fundamental understanding of railroad transportation engineering. Topics include railroad engineering efficiency, infrastructure, economics, energy, cost-benefit analysis, route selection, geometric design, alignment, high-speed rail, power, movement, materials characterization, subgrade design, construction, drainage.

Distribution: MR

### **CEE 456 - Railroad Track Structure Engineering (3 cr.)**

Prerequisite: CEE 341

Corequisite: or CEE 341 concurrently

This course introduces the concept of railroad track structure engineering. Topics include static, kinematic, and dynamic characteristics of trains, wheel/track interaction, characterization and design of railroad track components, turnouts and switches design, crossing, crossover, grade design, advanced track systems, special trackwork, track standards, inspection, condition assessment, and asset management.

Distribution: MR

### **CEE 461 - Water Resources Engineering (3 cr.)**

Prerequisite: CEE 361 or ME 316

This course is designed to provide students with a fundamental understanding of water resources engineering. Topics covered in this course include hydrologic cycle, hydrology, water quantity, watershed analysis, dams, flow in closed conduits, pipeline networks, open channel flow, turbines and pumps, and computer simulations. A team design project is required.

Distribution: MR

### **CEE 470 - Construction Engineering (3 cr.)**

Prerequisite: Junior or Senior CEE standing

This course is designed to provide students with a fundamental understanding of construction engineering. Topics covered in this course include construction documents, procurement methods, project operation and delivery methods, scheduling, management, construction safety, and cost estimating.

Distribution: MR

### **CEE 480 - Internship in Civil Engineering (3 cr.)**

See Internships

Distribution: MR

### **CEE 490 - 495 - Special Topics in Civil Engineering (3 cr.)**

This is a study of an advanced topic in engineering of special interest to civil engineering majors, but not carried in the catalogue on a regular basis.

Distribution: MR

## **CHEM - CHEMISTRY**

### **CHEM 101 - Modern Chemistry I (3 cr.)**

This is an introductory course intended to help students with little background in the physical sciences to understand the material environment. Modern concepts of atomic and molecular structure are developed and used to explain the properties of familiar substances including solids, liquids, and gases. Laboratory work is designed to enhance understanding of fundamental concepts at the practical level and may include field sampling and demonstrations as well as individual experiments.

Distribution: GUR/MR

Offered: fall semester

Two class hours, three-hour lab.

This course is a prerequisite.

Laboratory fees \$100.

### **CHEM 103 - Elementary Chemistry (3 cr.)**

This course is designed to provide students with the background needed to succeed in General Chemistry. Topics covered are: units and unit conversions, nomenclature of inorganic compounds, stoichiometry, atomic structure, the periodic table, chemical bonding, and molecular structure.

Distribution: GUR/MR

Offered: fall semester

Two class hours, three-hour lab.

This course is a prerequisite.

Laboratory fees \$100.

### **CHEM 105 - General Chemistry I (4 cr.)**

Prerequisite: One unit of secondary school chemistry.

This is the first course of a two-semester sequence intended for science and engineering majors and qualified students who wish to pursue a more in-depth study of chemical principles than is provided in CHEM 101.

The following topics are studied: physical measurements and chemistry data handling; states of matter and its properties; stoichiometry and reactions in aqueous solution; chemical reactions and energy relationships; atomic structure and periodic trends; and theories of chemical bonding and molecular structures. The laboratory experiments complement the topics covered in lecture and enable students to acquire basic chemistry laboratory skills.

Distribution: ER/GUR/MR

Offered: fall and spring semesters

Three class hours, three-hour lab.

This course is a prerequisite.

Laboratory fee \$100.

### **CHEM 106 - General Chemistry II (4 cr.)**

Prerequisite: CHEM 105 with minimum grade of "C-"

An extension of CHEM 105, this course illustrates and amplifies the principles developed previously. Detailed topics include but are not limited to: properties of solutions and liquids; chemical equilibria; reaction kinetics; acid-base chemistry; chemical thermodynamics; and electrochemistry. The laboratory experiments complement the topics covered in lecture and enable students to acquire more advanced laboratory skills including the use of instrumentation to monitor reactions and the characterization of compounds.

Distribution: GUR/MR

Offered: spring semester

Three class hours, three-hour lab.

This course is a prerequisite.

Laboratory fees \$100.

### **CHEM 152 - The Chemistry Of Fine Things (3 cr.)**

Prerequisite: BIO 101, PHYS 101, or CHEM 101.

In this course, students will explore the science behind the 'finer things of life.' The creation of paintings; perfume; wine; pieces of art, glass, and pottery; gourmet food; and other luxuries depend upon chemical, biological, and physical processes. Understanding these transformations and how they are used creatively is essential to both the development and preservation of works of art. In addition, a discussion of the biochemical processes that are central to the perception (and misperception) of these 'fine' things will be included.

This is a one semester course without a lab.

BIO 101, PHYS 101, or CHEM 101 followed by this course, would meet the General University Requirements for the Natural Science Perspective (NSP).

### **CHEM 155 - Drug Development Chemistry (3 cr.)**

Prerequisite: CHEM 101 or CHEM 103 or CHEM 105

This course will examine the journey of a molecule as it goes from an unknown molecule, becomes discovered as a lead molecule and transformed into a pharmaceutical drug. Students will learn how lead compounds are found, tested and optimized before undergoing clinical trials and hopefully appearing on the market. Class will consist primarily of lecture supplemented with group activities and discussions. This course is intended primarily for non-majors, with the underlying goal of understanding what is involved with developing a new drug and the financial impact of the process.

CHEM 101 or CHEM 103 or CHEM 105, followed by this course, would meet the General University Requirements for the Natural Science Perspective (NSP).

This is a one semester course without a lab.

### **CHEM 190 - Special Topics in Chemistry (1-3 cr.)**

Topics in chemistry that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **CHEM 209 - Organic Chemistry I (3 cr.)**

Prerequisite: CHEM 106 with minimum grade of "C-"; CHEM 219 or concurrently.

This is an introduction to the basic principles of organic chemistry. Emphasis is on functional group recognition and how the structures are related to the substances' physical and chemical properties. The alkene, alkyne, and alkyl halide structural classes are studied, in detail including their nomenclature, stereochemistry, and reactions. A mechanistic approach to studying organic chemical reactions is emphasized.

An introduction to key spectroscopic methods (IR and NMR) used to characterize organic compounds is included.

Distribution: MR

Offered: fall semester

This course is a prerequisite.

### **CHEM 210 - Organic Chemistry II (3 cr.)**

Prerequisite: CHEM 209; CHEM 219; CHEM 220 or concurrently.

This is a continuation of CHEM 209. The more complex structural classes are studied including but not limited to: the alcohols and ethers; aromatic compounds; carboxylic acids and derivatives; and the aldehydes and ketones. More complex reactions and their mechanisms are investigated. Synthesis design and spectroscopic methods used to determine chemical structure are emphasized.

Distribution: MR

Offered: spring semester

This course is a prerequisite.

### **CHEM 211 - Analytical Methods (3 cr.)**

Prerequisite: CHEM 106; CHEM 221 or concurrently

This is a study of the theory and methodology of classical and modern analytical chemistry. Topics include statistical treatment of data, errors, precipitation processes, the equilibria associated with gravimetric procedures, acid-base and redox titrations, and related items.

Distribution: MR

Offered: fall and spring semesters

This course is a prerequisite.

### **CHEM 219 - Organic Chemistry Laboratory I (1 cr.)**

Prerequisite: CHEM 209 or concurrently.

Laboratory for CHEM 209. The laboratory exercises are designed to increase students' skills in planning, conducting, and interpreting the results of experimental work. Students are introduced to the basics of synthetic organic chemistry techniques, including the characterization of organic compounds by chemical and instrumental methods.

Distribution: MR

Offered: fall semester

This course is a prerequisite.

Four-hour lab.

Laboratory fee \$100.

### **CHEM 220 - Organic Chemistry Laboratory II (1 cr.)**

Prerequisite: CHEM 210 or concurrently.

Building upon skills acquired via CHEM 219, the emphasis of the laboratory experiments is on synthesis and subsequent characterization and identification of organic compounds by both chemical and instrumental methods.

Laboratory for CHEM 210. This course is a continuation of CHEM 219.

Distribution: MR

Offered: spring semester

This course is a prerequisite.

Four-hour lab.

Laboratory fees \$100.

### **CHEM 221 - Analytical Methods Laboratory (1 cr.)**

Prerequisite: CHEM 211 or concurrently.

Laboratory for CHEM 211. The objective of the laboratory is the development of precise experimental techniques and organizational skills. Classical gravimetric and volumetric methods are applied in order to determine the percent composition of several samples of minerals, ores, or alloys, and to characterize qualitative aspects of selected systems.

Distribution: MR

Offered: fall and spring semesters

This course is a prerequisite.

Four-hour lab.

Laboratory fee \$100.

### **CHEM 240 - Research Projects in Chemistry (1-3 cr.)**

Prerequisite: CHEM 106, sophomore standing, a minimum GPA of 3.00, and permission of the instructor.

This course provides students with the opportunity to learn more advanced laboratory techniques and become familiar with special chemical handling. Safe general laboratory practice and accurate record keeping (laboratory notebook) are emphasized.

The project may be a more detailed investigation of a course topic or one that is independent of specific course content. The research topic may be proposed by either the instructor or the student; but, ultimately, the specific topic must be clearly defined and agreed upon by both.

### **CHEM 241 - Research Projects in Chemistry (1-3 cr.)**

Prerequisite: CHEM 106, sophomore standing, a minimum GPA of 3.00, and permission of the instructor.

This course provides students with the opportunity to learn more advanced laboratory techniques and become familiar with special chemical handling. Safe general laboratory practice and accurate record keeping (laboratory notebook) are emphasized.

The research project conducted may be a continuation of a previous project, a new, more detailed investigation of a course topic, or one that is independent of specific course content. The research topic may be proposed by either the instructor or the student; but, ultimately, the specific topic must be clearly defined and agreed upon by both.

### **CHEM 290 - Special Topics in Chemistry (1-3 cr.)**

Prerequisite: Sophomore standing.

Topics in chemistry that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **CHEM 312 - Instrumental Analysis (3 cr.)**

Prerequisite: CHEM 210 or concurrently, CHEM 211, CHEM 220 or concurrently, CHEM 221, CHEM 322, or concurrently; or permission of the instructor.

Building upon the concepts of classical quantitative analysis, the course includes the modern instrumental methods currently used for qualitative and quantitative analysis. For each major instrumental method, the fundamental interaction of energy with material samples is developed, followed by detailed examination of instrument design, operation, and application.

Distribution: MR

Offered: spring semester

### **CHEM 314 - Biochemistry (3 cr.)**

Prerequisite: CHEM 210 and CHEM 220 and Permission of Chair;  
Corequisite: CHEM 324

An exploration of the chemistry of biological macromolecules and complexes emphasizing the structure, organization, and function of proteins, nucleic acids, lipids, and polysaccharides. Topics also include: enzyme kinetics, major metabolic pathways, and bioenergetics.

Distribution: MR

Offered: spring semester

This course taken concurrently with CHEM 324.

Satisfies one of the Writing Intensive Course requirements for Arts and Science students.

### **CHEM 317 - Physical Chemistry I (3 cr.)**

Prerequisite: CHEM 211; CHEM 221; CHEM 327 or concurrently; MATH 124 or MATH 134; MATH 235 or FS 240; PHYS 124 or PHYS 134; Senior standing.

This course focuses on quantum theory with the overall objective being to teach the fundamentals of quantum mechanics and demonstrate their intrinsic relationship to spectroscopy and nanoscience. The topics examined range from how quantization arises from the Schrödinger equation to the discussion of specific systems including: the particle in the box; the harmonic oscillator; the rigid rotor; the hydrogen atom; multi-electron atoms, and molecules; and how quantization of energy is manifest in real-world applications.

Distribution: MR

Offered: in fall semester

This course is a prerequisite.

### **CHEM 318 - Physical Chemistry II (3 cr.)**

Prerequisite: CHEM 317; CHEM 327; CHEM 328 or concurrently, or permission of the instructor.

This is a continuation of CHEM 317. This course focuses on exploring fundamental thermodynamic concepts including: the properties of gases; partition functions; the first, second, and third laws of thermodynamics; Helmholtz and Gibbs energies; phase equilibria; and chemical kinetics. The comprehensive coverage of these topics includes an exploration of their real world applications.

Distribution: MR

Offered: spring semester

This course is a prerequisite.

### **CHEM 322 - Instrumental Analysis Laboratory (1 cr.)**

Prerequisite: CHEM 312 or concurrently.

Laboratory for CHEM 312. The instrumental methods used in this laboratory typically include: ultraviolet, visible, infrared, and atomic absorption spectroscopy; fluorescence spectroscopy; nuclear magnetic resonance spectrometry; gas and liquid chromatography; and mass spectrometry.

Distribution: MR

Offered: spring semester

Four-hour lab.

Laboratory fee \$100.

### **CHEM 324 - Biochemistry Laboratory (1 cr.)**

Corequisite: CHEM 324 and Permission of Chair

The laboratory exercises introduce students to modern techniques and methods that are required for the separation, purification, and characterization of biological macromolecules.

Laboratory for CHEM 314.

Distribution: MR

Offered: spring semester

Four-hour lab.

This course taken concurrently with CHEM 314.

Satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

Laboratory fee \$100.

### **CHEM 327 - Physical Chemistry Laboratory I (1 cr.)**

Prerequisite: CHEM 317 or concurrently.

Laboratory for CHEM 317. This course focuses on techniques and calculations that enable students to explore the chemical properties of matter at the molecular level. The quantum mechanical calculations and experiments parallel the content covered in CHEM 317.

Distribution: MR

Offered: fall semester

Four-hour lab.

Laboratory fee \$100.

### **CHEM 328 - Physical Chemistry Laboratory II (1 cr.)**

Prerequisite: CHEM 318 or concurrently.

Laboratory for CHEM 318. This course expands upon concepts, calculations, and techniques learned in CHEM 317 / CHEM 327 enabling students to explore both the chemical and physical properties of matter. The experiments complement the content covered in CHEM 318.

Distribution: MR

Offered: spring semester

Four-hour lab.

Laboratory fees \$100.

### **CHEM 333 - Independent Study in Chemistry (1-3 cr.)**

See "Independent Study".

Laboratory fees may be required.

### **CHEM 334 - Independent Study in Chemistry (1-3 cr.)**

See "Independent Study".

Laboratory fees may be required.

### **CHEM 340 - Research Projects in Chemistry (1-3 cr.)**

Prerequisite: CHEM 210 and CHEM 220 or CHEM 211 and CHEM 221, junior standing, a minimum GPA of 3.00, and permission of the instructor.

This course serves to build upon the student's laboratory skills and techniques, and is designed to help the student develop into a more knowledgeable and independent researcher. The student will learn to work more independently than in CHEM 240/CHEM 241 and will be expected to perform relevant chemical literature research, as required by the project. The research project conducted may either be a continuation of a previous project or involve chemical research that is focused on a completely different topic.

### **CHEM 341 - Research Projects in Chemistry (1-3 cr.)**

Prerequisite: CHEM 210 and CHEM 220 or CHEM 211 and CHEM 221, junior standing, a minimum GPA of 3.00, and permission of the instructor.

This course serves to build upon the student's laboratory skills and techniques, and is designed to help the student develop into a more knowledgeable and independent researcher. The student will learn to work more independently than in CHEM 240/CHEM 241 and will be expected to perform relevant chemical literature research, as required by the project. The research project conducted may either be a continuation of a previous project or involve chemical research that is focused on a completely different topic.

### **CHEM 390 - Special Topics in Chemistry (1-3 cr.)**

Prerequisite: Junior standing.

Topics in chemistry that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **CHEM 402 - Toxicology (3 cr.)**

Prerequisite: CHEM 314 and CHEM 324.

This course investigates the effects of xenobiotics on living systems. Integrating principles taken from chemistry, biology, pharmacology, and biochemistry, dose-response relationships between chemical exposures and disease states are identified. Basic processes central to understanding toxicological events including ADME (absorption, distribution, metabolism and excretion) are covered in detail. Selected toxicants, drugs, and poisons are studied and include representatives of various structural classes that induce pulmonary, hepatic, renal, cardiac, hematologic, and neurologic toxicity.

Distribution: MR

Offered: fall semester

Formerly CHEM 302 and ENVS 302.

### **CHEM 410 - Molecular Spectroscopy (3 cr.)**

Prerequisite: CHEM 318 or permission of the instructor.

An introduction to the theory of molecular rotational, vibrational, electronic, and spin resonance spectroscopy and applications in thermodynamics, kinetics, and the chemistry of materials.

Offered: occasionally

### **CHEM 421 - Inorganic Chemistry (3 cr.)**

Prerequisite: CHEM 210, CHEM 220, CHEM 317, CHEM 327

Corequisite: CHEM 431

This is a theoretical course discussing the wave mechanical concept of electronic structure and modern bonding theories including molecular orbitals. Additional topics include periodic properties, covalent and ionic compounds, advanced acid-base and solvent interactions, and the structure, properties, and reactions of coordination compounds.

Distribution: MR

Offered: spring semester

### **CHEM 425 - Introduction to Polymer Science and Engineering (3 cr.)**

Prerequisite: CHEM 210 and CHEM 318, or permission of the instructor.

This is an introductory survey of the organic and physical chemistry of polymer molecules. Emphasis is on methods of preparation, kinetics and mechanisms, techniques of characterization, and the details of conformations and chain dimensions. Other topics include structure-property relationships, mechanical and rheological properties, and the thermodynamics of polymers.

Offered: occasionally

### **CHEM 430 - Advanced Topics (1-3 cr.)**

Prerequisite: CHEM 317 and CHEM 421 or concurrently.

Members of the chemistry faculty offer selected topics in their areas of specialty with emphasis on advanced concepts. Topics to be covered are available from the department chair.

Offered: occasionally

Laboratory fees may be required.

### **CHEM 431 - Inorganic Chemistry Laboratory (1 cr.)**

Corequisite: CHEM 421

Laboratory for CHEM 421. This course consists of the laboratory preparation and characterization of inorganic, coordination, and organometallic compounds. Techniques such as infrared spectroscopy and magnetic susceptibility are used to characterize compounds. The writing of scientific laboratory reports is emphasized.

Distribution: MR

Offered: spring semester

Four-hour laboratory.

Laboratory fees \$100.

### **CHEM 440 - Undergraduate Research (1-3 cr.)**

Prerequisite: Senior standing.

See "Undergraduate Research"

Laboratory fees may be required.

### **CHEM 441 - Undergraduate Research (1-3 cr.)**

Prerequisite: CHEM 440 and Senior standing.

See "Undergraduate Research"

Laboratory fees may be required.

### **CHEM 470 - Seminar in Chemistry (1 cr.)**

Prerequisite: CHEM 421, or concurrently, or permission of instructor

This seminar is intended as a capstone experience for chemistry majors helping to prepare students for graduate studies and/or entrance into the professional workplace. Students will actively explore the current primary chemistry literature; investigate, discuss, and critique current research topics; prepare oral and poster presentations based upon their literature research; and prepare written briefs and seminar evaluations.

### **CHEM 480-481 - Internship in Chemistry (3 cr.)**

See "Internships".

### **CHEM 490 - Special Topics in Chemistry (1-3 cr.)**

Members of the chemistry faculty offer selected topics in their areas of specialty. These courses are not offered on a regular basis and may be repeated for credit if the topic differs.

Laboratory fees may be required.

## **CJ - CRIMINAL JUSTICE**

### **CJ 101 - Introduction to Criminal Justice (3 cr.)**

This course is an overview of the U.S. criminal justice system and the interaction of its components: the police, prosecution, the court systems, the correctional systems, parole, and probation. Career opportunities in criminal justice are explored.

Distribution: A&SR/MR

Offered: Fall and Spring semesters

This course is a prerequisite.

### **CJ 110 - Serial Killers & Their Victims (3 cr.)**

This course explores the topic of serial murder, including motivations, methods, and types of killers; serial killer victims; victim-offender relationships; and criminal justice response. Topics include gender, race, myths, and the media. Course incorporates academic and popular literature as well as film and official statistics.

### **CJ 190 - Special Topics in Criminal Justice (1-3 cr.)**

Topics in criminal justice that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **CJ 210 - Criminology (3 cr.)**

Prerequisite: CJ 101, SO 101, ENGL 132 and ENGL 133

Cross-Listed as: SO 210

This is an examination of the various categories of offenses and offenders including casual and habitual individual offenders, organized criminal enterprises, and white-collar criminals. Current theories and research, with an emphasis on understanding the causative factors and sociological implications of criminal and delinquent behavior, are included.

Distribution: MR

Offered: fall and spring semester.

Satisfies one of the Writing Intensive course (WIC) requirements for Arts and Sciences students.

### **CJ 211 - Corrections (3 cr.)**

Prerequisite: CJ 101

This course is an empirical analysis of the main considerations of correctional behavior and practice. Topics include the prison community, problems of treatment from the viewpoints of the offender and the treatment staff, and prevention and treatment in the community at large.

Distribution: MR

Offered: fall and spring semester

### **CJ 214 - Drugs, Society, and The Criminal Justice System (3 cr.)**

Cross-Listed as: SO 214

This is a study of the legal and social background of the pressing problem of drugs and alcohol and their use and abuse in American society.

Offered: fall and spring semester

### **CJ 215 - Race & the Criminal Justice System (3 cr.)**

Prerequisite: CJ 101

This course explores race, crime, and the criminal justice system. It starts with the historical picture of race and crime before surveying the contemporary landscape of race, crime, and the administration of justice. It also examines how race plays a role in policing, courts, sentencing, the death penalty, corrections, and juvenile justice. Special attention is paid to the role that race plays in the social construction of crime in the American context, while international similarities will also be highlighted.

### **CJ 218 - Police and Society (3 cr.)**

Prerequisite: CJ 101

This course will explore both the historical and contemporary aspects of policing in the United States. This will include the exploration of the police role, recruiting, and organization. Critical issues in contemporary policing, such as community relations, police legitimacy, and accountability will also be discussed.

Distribution: MR

Offered: fall and spring semesters.

### **CJ 234 - The Judicial Process (3 cr.)**

Prerequisite: CJ 211 or CJ 218

This course will explore the nature of law and the courts, the state and federal court systems of the United States, as well as the U.S. Supreme Court. Issues with respect to jurisdiction, operation, and workload will be discussed. Courts of England, Wales, and Germany will also be examined for comparative purposes.

Distribution: MR

Offered: fall and spring semester.

### **CJ 290 - Special Topics in Criminal Justice (1-3 cr.)**

Topics in criminal justice that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **CJ 291 - Special Topics in Criminal Justice (1-3 cr.)**

Topics in criminal justice that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

**CJ 302 - Women and the Criminal Justice System (3 cr.)**

Prerequisite: CJ 101

This course explores women's involvement in three primary areas of criminal justice – as victims, offenders, and practitioners employed in criminal justice agencies. Students will evaluate factors that contribute to women becoming involved with the criminal justice system in each of these capacities.

Offered: spring semester

**CJ 303 - Victimology (3 cr.)**

Victimology is the scientific study of victims of crime. This course will examine the characteristics of various victims of crime, victim-offender relationships, the interactions between victims and the criminal justice system, as well as the physical, emotional, and financial harm individuals suffer at the hands of offenders. In exploring these dynamics and connections, this course will address the theory, history, research, legislation, and policy implications related to victimization.

Offered: spring semester

**CJ 304 - Child Abuse and Neglect (3 cr.)**

This is a critical look at the policy, the theory, and the practice of state intervention into families on behalf of children. The study involves a review of the legal theory underlying child protective services, an explanation of the relevant federal and state laws, an investigation of the various types of state involvement with families, an exploration of the role of social workers and departments of social services, and a practical look into how the legal system deals with families and children. Foster care and child treatment by the system will be explored.

Offered: spring semester

Formerly "Children, Family, and the State"

Formerly CJ 250 "Children, Family, and the State"

**CJ 309 - Deviance (3 cr.)**

Prerequisite: SO 101, CJ 101, or LSOC 101

Cross-Listed as: SO 309

This is an analysis of social norm violations and group responses to deviant behavior. Emphasis is on the nature of social norms and rules; styles of social control; sources and varieties of deviant behavior; the development of unconventional ideologies and world views; and the role of deviant subcultures, associations, and organizations.

Distribution: MR

**CJ 310 - Criminal Law (3 cr.)**

Prerequisite: CJ 234

This is a study of the major felonies (murder, rape, robbery, assault, larceny, burglary, and arson), their definitions, and methods of proof.

Offered: Fall semester

Formerly CJ 230

**CJ 311 - Criminal Investigation (3 cr.)**

Prerequisite: CJ 218

This is an introduction to the process of criminal investigation. Emphasis is on investigative techniques including interrogation of suspects and witnesses; use of informants; surveillance and undercover assignments; photographing, collecting, and processing physical evidence; obtaining information; and identifying and locating suspects.

Offered: spring semester

Formerly CJ 231

**CJ 312 - Criminal Procedure (3 cr.)**

Prerequisite: CJ 218

This course studies the constitutional restrictions upon each aspect of a felony prosecution: arrest, investigation, booking, initial appearance, preliminary hearing, trial and sentencing. Major areas of interest are due process, arrest, search and seizure, right to counsel, and sentencing.

Offered: Spring semester

Formerly CJ 232

**CJ 313 - Criminal Justice Interviewing and Interrogation (3 cr.)**

Prerequisite: CJ 218

This course focuses on the art of inquiry and persuasion. The aim of the course is to complement standard techniques of communication while offering options for eliciting information. Interviewing procedures for obtaining statements from children and difficult adult populations are explored. Emphasis is on investigative methodologies consistent with federal and state constitutional principles.

Offered: spring semester

**CJ 315 - Research Methods in Criminal Justice (3 cr.)**

Prerequisite: CJ 210

This course deals with the issue of how to conduct research in the criminal justice field. It covers various research designs, sampling issues, survey construction, and interviewing. Emphasis will be placed on the strengths and weaknesses of various methodologies as they apply to criminal justice research.

Offered: Fall semester

**CJ 320 - Probation and Parole (3 cr.)**

Prerequisite: CJ 211

This course is an analysis of both past and present-day systems for probation and parole, an examination of state local referral systems of probation and parole, and an introduction to current innovation within the field. Topics include probation and parole in the United States, intensive supervision programs, the role of the probation and parole officer, and substance abuse treatment methods.

Offered: occasionally

**CJ 322 - Evidence (3 cr.)**

Prerequisite: CJ 101

The purpose of this course is to provide students with a general overview of the rules of evidence as practiced in the various courts of the United States. These rules are drawn from the rules of evidence as they existed as common law and were modified by various U.S.



Federal Courts. The course is designed to give students some background into the origin, usually dictated by a need, of certain rules of evidence at common law, and to view these rules as modified by contemporary courts. It has become increasingly important for all individuals working in the field of criminal justice to have some familiarity with evidentiary rules so that significant evidence may be perceived and preserved, and that criminal investigation may avoid the pitfall of obtaining evidence of little or no value in the courtroom.

Offered: fall semester

Formerly CJ 220

### **CJ 333 - Independent Study in Criminal Justice (1-3 cr.)**

See "Independent Study".

### **CJ 334 - Independent Study in Criminal Justice (1-3 cr.)**

See "Independent Study".

### **CJ 335 - Writing for the CJ Professional (3 cr.)**

Prerequisite: CJ 101; CJ 210; ENGL 132 and ENGL 133

This course focuses on the writing essential to those who work in the criminal justice system. Writing is an important tool in communication. Written material is used in a variety of areas in the criminal justice system including police reports, presentencing investigation reports, motions, affidavits, statements, incident reports, and memos.

Students entering the criminal justice field should be knowledgeable on report/narrative writing and persuasive writing. This course will focus on students' ability to observe activity and write about it accurately.

### **CJ 340 - Ethical Decision-Making (3 cr.)**

Prerequisite: CJ 211 and CJ 218

This course examines the major philosophical points of ethical theories and the decision process. Classical and modern viewpoints are studied in an attempt to gain a better understanding of the major social issues in today's world. Cultural implications are addressed and students gain a better understanding of their values and their personal philosophy.

Distribution: MR

Offered: fall and spring semester

### **CJ 341 - Constitutional Issues in Criminal Justice (3 cr.)**

Prerequisite: CJ 218 and CJ 234

This course will explore the constitutional issues as they relate to the police and corrections. Major areas of interest are due process and state and federal liability law as these concepts relate to the law enforcement.

Offered: Spring semester

### **CJ 342 - Juvenile Delinquency (3 cr.)**

Cross-Listed as: SO 342

This course focuses on the history, causes, behavior, laws, and treatment of juveniles. It includes the criminal justice system, the process within the system, court decisions, and alternatives to

incarceration. Where possible, on-site locations are visited. An in-depth perspective of juvenile gangs, drugs, and crime is included.

Offered: Fall semester

### **CJ 343 - Domestic Violence (3 cr.)**

Cross-Listed as: SO 343

Domestic violence between adults is studied from an interdisciplinary perspective. The cycle of violence, dominance, and control are among the issues covered sociologically and psychologically. The legal perspective includes discussion of proactive arrest policies, restraining orders, and anti-stalking legislation that have emerged across the United States.

Offered: spring semester

Formerly CJ 235.

### **CJ 348 - Introduction to Cyber Crimes (3 cr.)**

This course examines crime which targets computers, crimes committed by use of computers, and forms of evidence stored on computers. Forms and impact of cyber crime are studied within the context of societal harm and criminal justice response. Designed to familiarize students with the available and emerging State and Federal Law, the class will investigate legal limitations in the investigation and prosecution of cyber crime.

Offered: Fall semester

### **CJ 349 - Multicultural Policing (3 cr.)**

Prerequisite: CJ 218

This course is designed to familiarize the student with the theoretical and practical application of peace keeping in a multicultural setting. Students will explore the issues of diversity, cultural understanding, and communication facing the law enforcement community in a multicultural environment. Particular attention will be given to the concept of cross-cultural law enforcement for diverse communities.

Offered: Fall semester

### **CJ 353 - Violence Against Women (3 cr.)**

This course focuses on violence against women (and girls; VAW). As such, this course will cover the history of VAW as a social problem, its dynamics, prevalence, outcomes, research issues, how the media construes VAW, and contemporary VAW policy. Specific topics covered will include VAW that occurs in relationships (e.g., femicide, sexual violence, and psychological abuse), in the family (e.g., honor violence, female genital mutilation, violence committed against mothers and grandmothers, and familial rape and abuse), in public spaces (e.g., sexual violence and harassment in the workplace, in streets, and public places), and in institutions (e.g., institutional abuse in residential care facilities and VAW in higher education).

Offered: Fall semester

### **CJ 360 - Introduction to Homeland Security and Terrorism (3 cr.)**

This course is an introduction to the study of terrorism, and to the study of the United States response to defending the homeland. It examines the criminology and the controversy of terrorism. Students review definitions and motivations for terrorism: religious, ideological, nationalistic, and ethnic terrorism; domestic and

international terrorist movements; cyber, nuclear, biological, and chemical terrorism; terrorist financing; terrorism and the media; and the bureaucracy of homeland security.

Offered: Fall semester

Formerly CJ 260 Introduction to Terrorism and Homeland Security

### **CJ 362 - Counter-terrorism (3 cr.)**

Prerequisite: CJ 360.

This course looks at the various practices, trends, and trade-crafts of local, state, and federal agencies used against actual or perceived threats of terrorist activities. Specifically, students examine surveillance strategies, military and law enforcement responsibilities, and seizure and interrogation tactics in carrying out a war on terrorism.

Offered: Spring semester

### **CJ 363 - Weapons of Mass Destruction (3 cr.)**

Prerequisite: CJ 360

This course introduces and explains how the use of weapons of mass destruction by terrorists and rogue states could give them attack advantages over military, local, and federal law enforcement agencies. Today's danger of weapons of mass destruction comes mostly from the possible use of nuclear, biological, or chemical (NBC) weapons. In this course, students examine "how to respond to" and "how to deal with" NBC attacks. The course distinguishes facts from falsehoods about NBC weaponry.

Offered: Fall semester

### **CJ 375 - Emergency Response Management (3 cr.)**

Though some natural and humanmade disasters can be predicted, many cannot be anticipated. This course examines the personal and professional responses through the lenses of emergency response teams (e.g. law enforcement, medical and fire personnel) as well as through social institutions, including government agencies, education, and families in the face of widespread catastrophe. Formal protocol, along with case studies of disasters are explored.

Offered: Fall semester

### **CJ 390-395 - Special Topics in Criminal Justice (1-3 cr.)**

Topics in criminal justice that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **CJ 396 - Seminar of Current Issues in Criminal Justice (3 cr.)**

Prerequisite: CJ 101

This seminar looks at current developments, issues, and/or debates facing the criminal justice system and its various subsystems including courts, corrections, and/or policing.

Formerly "Seminar of Current Issues in Corrections"

### **CJ 403 - Comparative Criminal Justice Systems (3 cr.)**

Prerequisite: CJ 101

This course provides an overview of selected critical issues relevant to the study of transnational and international criminal justice and criminology. There will be an examination of the problems inherent in defining crime cross-culturally, various forms of criminality including violence and property crime and selected serious transnational crime problems including the illicit trade in counterfeit goods, drugs, humans, international terrorism, and crime and conflict. Finally, this course will explore the diversity of criminal justice systems worldwide, including the police, courts, and correctional systems.

Offered: occasionally

### **CJ 405 - Organized Crime (3 cr.)**

This course will provide an overview of organized crime in the United States, its history, and modern influences. The student will explore traditional organized crime (the mafia), as well as other forms of organized crime (ethnic groups, biker gangs, etc.).

Offered: occasionally

### **CJ 415 - Forensic Science (3 cr.)**

Prerequisite: CJ 311 and BIO 101, or CHEM 101, or PHYS 101

This is a study of scientific principles applied to the investigation and prosecution of crime. Topics are drawn from biology, chemistry, and physics.

Offered: spring semesters.

Formerly CJ 325

### **CJ 420 - Criminal Justice Investigation & Exoneration (3 cr.)**

Prerequisite: CJ 101

This course allows all students to gain knowledge of criminal investigation, criminal procedure, and criminal law while conducting research and writing of investigative reports. This course serves a dual purpose in preparing students in the criminal and investigative way of reporting as well as the opportunity to view and report the facts of a case in an open-minded procedure by establishing the truth of the matter.

Formerly ILP 380 "Investigative Reporting"

### **CJ 425 - Problem Analysis in Victim Studies (3 cr.)**

Prerequisite: CJ 303

This course draws on students' skills and knowledge from prior courses to address victimization issues with a focus placed on application of research skills and analytic techniques to address these issues. Various facets of victimization will be explored including intimate partner violence, family violence, violence against women, elder abuse, child abuse and neglect, stalking, and human trafficking. Students will conduct basic research to recommend criminal justice policy.

### **CJ 430 - Human Trafficking (3 cr.)**

This course focuses on the social awareness of human trafficking in all forms. We will examine how human trafficking is defined, its prevalence, and the places in which it occurs. We will also examine who is trafficked, the indicators of human trafficking, and the consequences of human trafficking. Finally, we will discuss various interventions and disruptions used to combat human trafficking.

**CJ 440 - Immigration and Crime (3 cr.)**

This course will be an introduction to the topic of immigration and crime. It will explore the prevailing myths and realities vis-à-vis the immigration-crime nexus in the contemporary American context. The politics of immigration and crime and its impact on criminal justice policy will also be explored. Finally, pressing global issues regarding immigration and crime will be introduced.

**CJ 445 - Mental Health and the CJS (3 cr.)**

Prerequisite: CJ 101, SO 101, or SW 100, plus Sophomore Standing

This course will explore contemporary issues surrounding criminal justice responses to persons having mental, cognitive, and psychiatric disabilities. It will also explore the varied causes of criminal behavior among those who have mental health challenges.

Offered: spring semester

Formerly CJ 206 Disability and Mental Health Issues in Criminal Justice

Formerly CJ 306 Disability and Mental Health Issues in Criminal Justice

Formerly cross listed with SO 445

**CJ 450 - Senior Seminar (3 cr.)**

Prerequisite: CJ major and senior standing.

This course includes a basic review of general principles of criminal justice. Each student will be required to do extensive independent research and produce a research paper.

**CJ 480 - Internship in Criminal Justice (1-3 cr.)**

See "Internships".

**CJ 481 - Internship in Criminal Justice (1-3 cr.)**

See "Internships".

**CJ 490-491 - Special Topics in Criminal Justice (3 cr.)**

Topics in criminal justice that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

**CL - COLLOQUIA****CL 190 - Special Topics in Colloquia (1 cr.)**

Topics that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

**CL 200 - Colloquium (1-3 cr.)**

Topics that are not specific to departments and that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

**CL 201 - Colloquium (1-3 cr.)**

Topics that are not specific to departments and that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

**CMGT - Construction Management****CMGT 200 - Construction CAD (3 cr.)**

This course is designed to provide students with a fundamental understanding of construction graphics, AutoCAD, mechanical electrical and plumbing drawings, blueprints, and building designs.

Distribution: MR

**CMGT 201 - Construction Machinery (3 cr.)**

This course is designed to provide students with a fundamental understanding of earthwork machines, construction tools, cost of operation, machine selection, and scheduling.

Distribution: MR

**CMGT 202 - Fundamentals of Statics (3 cr.)**

Prerequisite: Complete MATH 123 or MATH 133.

Cross-Listed as: ME 202/HONE 202

This course is designed to provide students with a fundamental understanding of particle and rigid body equilibrium, force vectors, force systems, internal forces, simple structural analysis, friction, moment of inertia, and virtual work.

Distribution: MR

**CMGT 300 - Soil Behavior and Site Development (3 cr.)**

Prerequisite: Complete CEE 251

This course is designed to provide students with a fundamental understanding of soil behavior, soil type, compaction, basic foundations, and real estate development.

Distribution: MR

**CMGT 301 - Analysis of Concrete, Steel, & Wood Structure (3 cr.)**

Prerequisite: Complete CMGT 202 or ME 202.

This course is designed to provide students with a fundamental understanding of structures, loading analysis, materials selection, methods of construction, building codes, and computer applications.

Distribution: MR

**CMGT 302 - Passive and Active Bldg Systems (3 cr.)**

Prerequisite: Junior or Senior standing.

This course is designed to provide students with a fundamental understanding of alternative energy sources, energy and water demands, HVAC systems, fire protection and safety systems, design concepts, sustainability, life cycle analysis, green buildings, and ROI analysis.

Distribution: MR

**CMGT 303 - Leadership and Human Resources Skills (1 cr.)**

Prerequisite: Junior or Senior standing.

This course is designed to provide students with a fundamental understanding of lifelong learning, leadership skills, communication, employee development, employee assessments, and legal issues in HR.

Distribution: MR

**CMGT 304 - Construction Health and Safety, Risk Management (3 cr.)**

Prerequisite: Junior or Senior standing.

This course is designed to provide students with a fundamental understanding of health and safety standards, hazard identification, accident prevention, risk analysis, OSHA, safety plan, and compliance.

Distribution: MR

**CMGT 305 - Construction Project Bidding & Cost Management (3 cr.)**

Prerequisite: Complete AC 202.

This course is designed to provide students with a fundamental understanding of material selection, material and labor costs, bidding strategies, planning and scheduling, overhead, cost management, and software applications.

Distribution: MR

**CMGT 400 - Material Quality Control (3 cr.)**

Prerequisite: Complete CEE 240

This course is designed to provide students with a fundamental understanding of construction materials testing, ASTM procedures, concrete analysis, and materials inspection.

Distribution: MR

**CMGT 401 - Capstone Design (3 cr.)**

Prerequisite: Senior standing

This course is designed to provide students with a comprehensive design experience. Students will learn the entire process of executing a team-based senior design project, from construction pre-design through commission. Students are expected to present project outcomes in a public setting.

Distribution: MR

**CMGT 402 - Material Quality Control Laboratory (1 cr.)**

Corequisite: Co-requisite CMGT 400

This course is designed to provide students with a fundamental understanding of concrete tests, soils tests, masonry tests, asphalt tests, and on-site material quality control.

Distribution: MR

**CMGT 403 - Construction Law, Contract, & Regulation (3 cr.)**

Prerequisite: Junior or Senior standing

This course is designed to provide students with a fundamental understanding of construction law, contractual relationships and obligations, insurance, and regulations.

Distribution: MR

**CMGT 404 - Computer Applications in Construction (3 cr.)**

Prerequisite: Complete CMGT 200

This course is designed to provide students with a fundamental understanding of Building Information Modeling, scheduling and

management software, and other computer applications.

Distribution: MR

**CMGT 439 - Senior Design Projects I (3 cr.)**

Corequisite: Graduating senior status.

Cross-Listed as: IE 439

Project management material covered in IE 410 is applied to business and industry problems. Each student develops a complete senior project plan in an industrial setting, obtains approval by a faculty and industrial project advisor, and makes an oral presentation of the proposal to the faculty. Guest lecturers relating to patents, technical writing, ethics, engineering registration, and other professional concerns are included.

Distribution: MR

**COMM - COMMUNICATION****COMM 100 - Principles of Communication (3 cr.)**

This course provides an introduction to basic theories and practices of interpersonal, small group, and public communication. The course explores effective listening, dyadic dynamics, nonverbal communication, verbal communication, and similarities and differences between speaking and writing.

Distribution: MR

Offered: every semester.

This course is a prerequisite.

Formerly COMM 201.

**COMM 102 - Introduction to Public Speaking (3 cr.)**

This course is designed to develop students' skills in researching, composing, and presenting speeches in public, and in adapting principles of public speaking to different situations and contexts.

Distribution: GUR/MR

Offered: every semester.

This course is a prerequisite.

Formerly "Public Speaking"

Formerly COMM 202

**COMM 190-192 - Special Topics in Communication (1-3 cr.)**

Topics in communication that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

**COMM 205 - Mass Communication (3 cr.)**

This course offers an introduction to the structure and function of mass communication, including print, film, and telecommunications. The course addresses the history, purpose, problems, and power of the mass media.

Distribution: A&SR/MR

Offered: every semester.

**COMM 206 - Introduction to Communication Research (3 cr.)**

Prerequisite: COMM 100 or COMM 233, or the equivalent.

This course introduces students to research methods in communication, addressing such issues as the reliability of information sources, measurement factors and techniques, qualitative vs. quantitative methodologies, experimental research, and ethical considerations.

Distribution: MR

Offered: typically in Fall only

**COMM 233 - Business Writing and Communication (3 cr.)**

Prerequisite: ENGL 132 and ENGL 133, or equivalent, with grade of C- or better.

This course helps students become effective communicators by teaching various forms of communication, including verbal, nonverbal, cultural, written, oral, and online communication designed to prepare them to send messages in professional contexts. Students are expected to produce common forms of business writing and a presentation, with emphasis on grammatical accuracy, spelling, punctuation, and the technical aspects of business formats.

The course is not open to students who have taken COMM 100 or equivalent.

Offered: every semester

This course is a prerequisite.

**COMM 235 - British Press and Politics (3 cr.)**

Cross-Listed as: POSC 235

This course examines the interaction between British news media and the national government. Students of American media and politics may be surprised to learn that the constitutional guarantee of free press that Americans take for granted is not codified in a single document in Great Britain. Instead, the media-government relationship has evolved over time largely through practice, with print media today policing themselves through the Independent Press Standards Organisation and electronic media laboring under tighter government control. We will examine the relationship between British media and government in comparison with their counterparts in the United States. The course will consist of a mix of lecture notes, class discussions, case studies and field trips. Students will complete short homework assignments and quizzes while in London, and they will submit a more in-depth research paper after they return to the United States.

This course satisfies the Social/Behavioral Science perspective requirement. This course can also be taken at the 300-level with permission of instructor.

Taught in summer session in London.

**COMM 245 - Video Editing and Production (4 cr.)**

This course focuses on the technical and aesthetic aspects of digital audio and video editing, as well as studio lighting and sound design, studio production dynamics, and script development. Classes consist of instruction in using digital editing software, operating studio and field cameras, and understanding and using audio-visual conventions.

Distribution: MR

Equipment Fees \$200.

**COMM 251 - Video Communication (3 cr.)**

Prerequisite: COMM 241 or COMM 245

This course offers an introduction to writing and presenting TV news stories and commercials.

Distribution: MR

Offered: Fall only

Formerly "TV Broadcasting"

Equipment Fees \$200.

**COMM 260 - Communication Web Design (3 cr.)**

Prerequisite: COMM 100, or the equivalent.

Using industry-standard software such as Macromedia Dreamweaver for HTML editing, and Macromedia Fireworks for image manipulation; students will create, test, evaluate, and critique class work as well as existing web pages. Students will learn the fundamentals of web page design: Research, Typography, Contrast, Layout, Grid Systems, Identity, and Usability. Students will obtain a working knowledge of HTML, Cascading Style Sheets (CSS), and JavaScript.

Distribution: MR

Offered: Fall only

**COMM 280 - Organizational Communication (3 cr.)**

Prerequisite: COMM 100 or COMM 233, or the equivalent.

This course is designed to explore the communication dynamics, effective communication processes, and misunderstandings that may occur at all levels of an organization. Students will learn about the evolution of different theories about what constitutes an effective organizational structure; assess the roles, rights, and responsibilities of individuals in a variety of institutional positions; and consider the relationship among organizational norms, organizational structure, and interpersonal communication practices. They will also explore how organizational cultures are created and altered in response to internal and external stimuli.

Distribution: MR

Offered: Fall only

**COMM 283 - Health Communication (3 cr.)**

This course introduces students to theories of health communication and information about patient-provider communication, social support, and media influence on health-related behavior. Using both theories and case studies, students will gain a better understanding of the healthcare context in the U.S. and the role communication plays in that context.

Distribution: MR

**COMM 285 - Introduction to Public Relations (3 cr.)**

Prerequisite: COMM 100 or COMM 233, or the equivalent.

Students in this course will study several types of communication that are common in business and professional environments. Topics include professional presentations, techniques of interviewing, questionnaire construction, small group dynamics, symposium planning, and presentation.

Distribution: MR  
Offered: every semester.

**COMM 290-291 - Special Topics in Communication (1-3 cr.)**

Prerequisite: COMM 100 or permission of instructor.

Topics in communication that are not offered on a regular basis are examined. This course may be repeated for credit if the topic varies.

**COMM 300 - Communication Theory (3 cr.)**

Prerequisite: COMM 206.

This course describes the purpose and significance of theories of intrapersonal, interpersonal, small group, public, intercultural, professional, and mass communication, highlighting the distinctions among different theoretical paradigms within these areas. It also enables students to apply communication theories to contemporary issues within the communication disciplines as well as everyday life.

Distribution: MR

**COMM 315 - Rhetoric of Social Justice Movements (3 cr.)**

Prerequisite: COMM 100, or COMM 233, or the equivalent; and junior standing.

This course examines the ways in which language is used and misused as a communication tool, as well as a variety of language-based communication issues, including the cultural, political, rhetorical, and/or professional implications of word choice. Students will also consider the role of language in persuasion and in the cultivation and maintenance of social power.

Distribution: MR

Formerly "Language in Communication"

Formerly "Language, Power and Communication"

**COMM 320 - Small Group Communication (3 cr.)**

Prerequisite: COMM 100, COMM 201 or COMM 233, or the equivalent; and junior standing.

Students will study several types of communication involving small groups that are common in business and professional environments. Students will consider how leaders and followers emerge in small groups; what factors contribute to or detract from effective small group dynamics; and what roles different individuals may play in small groups.

Distribution: MR

**COMM 321 - Interpersonal Communication (3 cr.)**

Prerequisite: COMM 100, COMM 201 or COMM 233, or the equivalent; and junior standing, or permission of instructor.

This course explores all of the channels of nonverbal communication, analyzing individual, cultural, and contextual variables that affect it.

Distribution: MR

Formerly "Nonverbal Communication"

**COMM 324 - Media Industries, Government, and Society (3 cr.)**

Prerequisite: COMM 100 or COMM 233, and COMM 205.

This course explores the relationship among media industries, government, and society in the United States. The course will provide a brief history of media regulation and deregulation, examine the impact of new media (cable, satellites, and the Internet) on old media (broadcast television and radio), consider how to define and to operate media in the public interest, and scrutinize the relationship among corporate interests, government interests, consumer interests, and citizen interests. Students will also examine the role of news media and entertainment media-as well as news media as entertainment media-and the effects of media mergers on media technologies, the government, and U.S. culture.

Distribution: MR

**COMM 326 - Race, Gender, and Ethnicity in the Media (3 cr.)**

Prerequisite: COMM 100 or COMM 233, and COMM 205.

This course examines the media as cultural artifacts that provide the images and representations that help shape our identities, beliefs, and values. Special attention is paid to questions of race, gender, and ethnicity. Students investigate such forms of communication as advertising, popular music, popular fiction, television, film, and the Internet.

Distribution: MR

**COMM 328 - Health Communication Campaigns (3 cr.)**

Prerequisite: COMM 283 or COMM 285

This course is an applied undergraduate course designed to provide students in public relations and health communication with a semester-long experience in public relations campaign design. As such, it draws heavily on students' previous training in public relations principles, research, strategy, and writing to develop a health communication campaign for a client in the healthcare field. Students will examine previous health communication campaigns, experiment with new modes of conveying information about health issues to the general public, and devise a multimedia communication campaign promoting a significant issue pertinent to public health.

Distribution: MR

**COMM 333 - Independent Study in Communication (1-3 cr.)**

See "Independent Study"

**COMM 334 - Independent Study in Communication (1-3 cr.)**

See "Independent Study"

**COMM 340 - Business Communication (3 cr.)**

Prerequisite: Junior standing and two courses in English writing with grades of "C-" or better.

This course explores the principles of effective professional writing. The course requires extensive practice in planning, organizing, writing, revising and editing, and analyzing memoranda, executive summaries, letters, reports, speeches, and other forms of writing commonly found in business and industry contexts. Students will be expected to focus on grammatical accuracy and other technical

elements of English writing, as well as using concise and precise prose. Oral presentations will also be expected.

Distribution: MR

Offered: every semester.

### **COMM 344 - Event Planning (3 cr.)**

Prerequisite: COMM 283 or COMM 285

Event planning and management is designed to employ students' understanding of communication techniques, developing their skills in creating messages designed with a target audience in mind while enhancing their professional presentation and writing skills. In this course students will have creative freedom while learning how to plan an event, from idea to implementation. By the end of the course, students will know how to parse an audience, combine words and images to attract a target public, and understand theoretically and practically the fundamentals of event planning and management.

Distribution: MR

### **COMM 348 - Intercultural Communication (3 cr.)**

Prerequisite: COMM 100 or COMM 233, or the equivalent; and junior standing.

This course promotes the appreciation and understanding of other cultures by instructing students in the use of cross-cultural communication skills. Activities include discussion, guest lectures, simulations, case studies, role-playing, and presentations.

Distribution: MR

### **COMM 352 - Multimedia Communication (3 cr.)**

Prerequisite: COMM 251.

This course focuses on advanced TV news reporting with instruction and practice in reporting, writing, and producing in-depth broadcast news stories. Emphasis is placed on investigative techniques, interviewing, writing for broadcast news, photography, voice-overs, and on-the-air talent techniques for production.

Offered: Spring only

Formerly "TV Broadcasting II"

Equipment Fees \$200.

### **COMM 356 - Global Communication (3 cr.)**

Prerequisite: COMM 205

This course examines the development and current state of global communication networks and communication policies. It devotes special attention to evaluating international telecommunication infrastructures and regulatory policy frameworks; examining national sovereignty and cultural identity in relation to pressures toward cultural homogenization; discussing media imperialism and various forms of resistance to globalization; and assessing the development of competition strategies and market dynamics on communication policy and practice. Different theories of globalization will also be discussed.

Distribution: MR

### **COMM 360 - Sportswriting (3 cr.)**

Prerequisite: JRNL 100 or JRNL 101, and two courses in English writing with grades of "C-" or better.

Cross-Listed as: JRNL 360

This course introduces students to the craft of sportswriting. Beginning with a discussion of how to approach writing in general, the course focuses principally on analyzing models of successful sportswriting and developing skills in producing sportswriting. Students will be expected to read copiously and critically and to write (and revise) several short assignments as well as one research-based project. This course is cross-listed as JRNL 360.

### **COMM 371 - Advanced Radio Reporting (3 cr.)**

Prerequisite: COMM 241 or COMM 245, and COMM 251; or JRNL 100 or JRNL 101, and COMM 245

Cross-Listed as: JRNL 370

This course provides students with professional radio reporting opportunities. It focuses on radio news reporting with instruction and real-life applications in developing, researching, writing, and producing broadcast news stories to be aired on National Public Radio station WAMC. Students receive on-the-air talent techniques and one-on-one coaching for professional voice-over productions. Story ideas are assigned by the instructor, the WAMC news director, and news producers; students must also generate his/her own story proposals. This course is cross-listed as JRNL 370.

### **COMM 390-398 - Special Topics in Communication (1-3 cr.)**

Prerequisite: Junior standing and permission of instructor.

Topics offered depend on student interests as well as particular interests of instructors. This course may be repeated for credit if the topic varies.

### **COMM 480 - Internship in Communication (1-3 cr.)**

See "Internships".

### **COMM 481 - Internship in Communication (1-3 cr.)**

See "Internships".

### **COMM 490 - Seminar in Media and Journalism (3 cr.)**

Prerequisite: Graduating communication seniors or permission of instructor and COMM 300.

This capstone course is designed to enable students in media and journalism concentrations to integrate the theoretical and practical knowledge from their previous coursework into a cohesive whole. Students will examine the social, political, cultural, and economic contexts of mass media and journalism; probe a variety of theoretical frameworks for understanding mass media and journalism; and design and implement a substantial research project that draws on those contexts and frameworks.

Distribution: MR

Formerly "Seminar in Media Theory and Journalism"

### **COMM 491 - Seminar in PR and Health Communication (3 cr.)**

Prerequisite: Graduating communication seniors or permission of instructor and COMM 300.

This capstone course is designed to enable students in professional and public relations concentrations to integrate the theoretical and practical knowledge from their previous coursework into a cohesive whole. Students will explore current issues and factors affecting communication within and across profit and nonprofit corporations;

consider theoretical approaches designed to illuminate interpersonal and professional communication dynamics; and design and implement a significant research project related to their chosen field of study.

Distribution: MR

Formerly "Seminar in Professional Communication and Public Relations" and "Seminar in Public and Corporate Communication".

## CPE - COMPUTER ENGINEERING

### CPE 271 - Digital System Design (4 cr.)

This is an introductory level course that gives its participants ability to analyze and design digital circuits. Students learn procedural approaches to designing digital circuits starting from specification of the problem. Students become familiar with the number systems that are used in computers and other digital circuits. Students learn to use Boolean algebra and logic gates; and proof of logic theorems. Methods of manipulating and simplifying Boolean expressions are learned. Basic combinational logic function models are designed. Students become familiar with arithmetic functional blocks, latches, flip-flops, counters, and registers. Sequential circuits are also designed, and students are introduced to VHDL programming. In addition to the classroom portion of the course, there are several laboratory sessions where students build and test their logic designs. The methods for assessing student learning in the course are quizzes, tests, and lab reports.

Three class hours, two lab hours.

Distribution: MR

This course is a prerequisite.

Formerly "Digital Design"

### CPE 305 - Data Structures for Embedded Firmware Design (3 cr.)

Prerequisite: CPE 271, EE 285, and ENGR 105/HONE 105

This is an introductory course in understanding abstract data types, and data structures for firmware design of embedded systems. Students learn data types and statements, functions, pointers, and arrays in C++; and become proficient in the syntax and semantics of C++. Students learn abstract data structures and their implementations, such as singly linked list, stack, queue, and doubly linked list; binary tree structures and tree traversal algorithms, and sorting algorithms. Students understand the difference among data structures and are able to select appropriate data structures for solving engineering problems. Students will enhance the skills needed to troubleshoot systems. The course prepares students for advanced course work.

Distribution: MR

Formerly "Firmware Design for Embedded Systems"

### CPE 310 - Microprocessors I (3 cr.)

Prerequisite: CPE 271, EE 285 or equivalent

This is an introductory course in computer architecture utilizing low level computer programming as a vehicle for student understanding. Students learn about the fundamental restrictions the underlying architecture places on the software they write. Students also develop skills in writing programs using operations that electronic circuits on

a processor can perform. Atmel's AVR series of microcontrollers are used as example machines for running and testing programs. Students learn assembly language instructions, different addressing modes, and their use in different situations. They use basic programming constructs such as branching and loop control, data structures, and program debugging and testing. The methods of assessing student learning in this course are programming and other assignments and exams.

Distribution: MR

Formerly "Machine and Assembly Language"

### CPE 323 - Embedded Systems Laboratory (1 cr.)

Prerequisite: EE 319 and CPE 310

Corequisite: CPE 355 or concurrently

A laboratory that emphasizes the design of embedded systems. Topics include interfacing to digital and analog circuits, sensors, and actuators. Communication using serial and parallel I/O, analog to digital conversion, interrupts and timers are covered. The basic principles of real-time design, scheduling, thread synchronization, producer-consumer problem, critical sections, performance, and real-time operating systems (RTOS) are studied. Students apply real-time techniques to implement projects constrained by time and deadlines.

Distribution: MR

### CPE 330 - Computer Organization (3 cr.)

Prerequisite: CS Majors: Junior standing.

This is an introductory course in processor organization and assembly language programming. Students learn enough basics of digital circuits to understand how a processor functions, and how numbers are represented inside a computer. They then learn how to program this processor in assembly language. Addressing modes, branching, and loop control are included. Students also learn how to test and debug assembly language programs by doing several programming assignments. Students will learn the functions of the assembler, linker, and loader programs. The primary methods of assessing student learning in this course are programming assignments and exams. This course may not be taken for credit by electrical engineering majors.

### CPE 333 - Independent Study in Computer Engineering (3 cr.)

See "Independent Study".

Distribution: MR

### CPE 355 - Real Time Embedded Kernels (3 cr.)

Prerequisite: CPE 305 or equivalent, CPE 310 or equivalent.

This is an introductory course in the theory, design, and use of real-time kernels for embedded systems. Classes are a mixture of hands-on laboratory work and standard presentation of material and examples. A real-time kernel is the control software that manages the time resources of a microprocessor. Students learn the basic structure and services of a kernel. Topics include dispatching, hierarchical scheduling, priority-driven scheduling, real-time schedulers, scheduling groups, and multitasking. Students also learn to utilize tasks to describe multiple threads of execution in a computation. Students study methods to manage and control task execution as well as other kernel services.

Distribution: MR



**CPE 360 - Microprocessors II (4 cr.)**

Prerequisite: CPE 310.

This is a course in the theory and design of modern microprocessor systems. It is a continuation of Microprocessors I and builds on concepts learned in that course. Students increase their awareness of the basic principles of system design, including hardware, software and systems integration. They design, fabricate, and test a complete working ATMEGA based system. Students design memory mapped systems which include non-volatile (FLASH etc.) and volatile (RAM) memory. They also study bus timing and loading considerations. In addition, students also design I/O subsystems, supporting both parallel and serial devices. A semester long design project is employed to provide the students with a hands-on experience. Upon successful completion of the course, the student will have learned about more detailed microprocessor architecture concepts, bus interfacing and clocking, memory system design, how to interface peripheral chips and devices to the bus, to use different serial and parallel I/O interfaces, to build I/O ports and the concept of a total system design. The method of assessing student learning in the course includes quizzes, exams, lab reports, and lab demonstrations.

Three class hours, three lab hours.

Distribution: MR

Formerly "Microprocessor Systems and Design"

**CPE 420 - Computer Architecture (3 cr.)**

Prerequisite: CPE 310 and CPE 271.

Cross-Listed as: CPE 520

This is a senior level course in the theory and design of modern computer architectures. Students learn the fundamental organization of processors, controllers, memory, and communication links as well as the issues involved with internal data representation. Students will understand the close correlation between registers, bus interconnections, and instruction sets. Students gain skills in computer performance prediction by analyzing advanced features including instruction pipelines, arithmetic circuits or co-processors, cache, and virtual memory. After successfully completing this course students understand the issues involved with instruction set design and implementation and are able to evaluate new architectures. The methods of assessing student learning in the course are homework assignments, a term project, and exams.

Distribution: MR

**CPE 422 - Internet of Things (IoT) (3 cr.)**

Prerequisite: A programming language (e.g. C/C++), and CPE senior standing or EE senior standing.

Cross-Listed as: CPE 522

This introductory course covers the basic building blocks of the Internet of Things (IoT) and develops the necessary skills required to design and implement products and services. Students learn to develop applications under the Linux operating system, interface circuits and sensors, develop scripts to process data, use IoT programming tools, and leverage web technologies for remote monitoring and control of electronic devices using the Internet. The roles of cybersecurity, machine learning and data analytics in IoT systems are discussed. Through hands-on projects, students design and build IoT systems for sensing, processing, actuation, and wireless communication using mobile single-board computers.

**CPE 425 - Software Engineering (3 cr.)**

Prerequisite: A structured programming language.

Cross-Listed as: CPE 525

This is a first year graduate course in software system design fundamentals. Students learn the approaches to designing medium to large-scale systems. After completing this course, students understand lifecycle issues in modern software design. They learn a variety of software design methodologies including structured design, top down design, bottom up design, and incremental design and are introduced to object oriented design. Students participate in a semester-long team project with design documentation delivered and presented at specified design review milestones. The methods of assessing student learning in the course are homework assignments, a research paper, and a semester long design project that culminates in a formal presentation.

**CPE 427 - Computer Engineering Laboratory (2 cr.)**

Prerequisite: CPE 360.

Corequisite: CPE 420.

A laboratory emphasizing the integration of advanced techniques in the design and implementation of an embedded microcontroller. Topics include embedded systems design and development using a flash based, industry standard microcontroller, interfacing serial and parallel I/O, Analog to Digital conversion (ADC), Timers as well as interrupt structures. The course provides students the opportunity to design a control and data acquisition system for the alternative fuel car interdisciplinary project. Students design, construct and test a microprocessor based real-time system. The embedded computer is used to control and acquire performance data from the alternative fuel vehicle. Sensors are interfaced to the ADC and data is later uploaded to a workstation for analysis. Students learn about the challenges of system's integration by participating in a vehicle race with team members from electrical and computer engineering.

Distribution: MR

One class hour, one three-hour lab.

**CPE 435 - Requirements Analysis (3 cr.)**

Prerequisite: CPE 425

This course addresses the issues associated with eliciting, recording, and managing requirements. Poor requirements processes are a leading cause of project failure. Engineers must have the skills and tools to effectively collect, verify, validate, and implement requirements in order to improve the success rates of their projects. Major models of requirements will be examined. Methods of detecting ambiguity will be discussed and practiced. A comprehensive survey of various methods of eliciting, recording, and verifying requirements will be considered. Additional topics include: writing requirements, formal specification analysis, and formal notations. The primary methods of assessing student learning are homework assignments, a presentation, a group project, a midterm, and final exam.

**CPE 436 - Project Research, Innovation and Development (2 cr.)**

Prerequisite: Senior standing.

This course is designed to enable students to select and get started on the year-long senior project. Students are guided in formulating a proposal for a Senior Design Project in preparation for project completion in CPE 440. Faculty and representatives from industry present ideas for Senior Design Projects and each student chooses a project, and develops and writes a project proposal with the

supervision and guidance of a faculty advisor. In the process of completing this course, students learn about the product development process - they learn about researching the problem being addressed, how to innovate and develop products. Students will also learn about needs analysis, identifying business opportunities and assessing market potential. The assessment in this course is based primarily on measurements related to making progress towards project completion. This includes maintaining a log book, submitting brief reports and making a presentation at the end of the semester that documents the project status. Additionally, short papers on some of the issues discussed in presentations will also be graded and counted to the final grade

### **CPE 438 - Software Quality Assurance (3 cr.)**

Prerequisite: CPE 425

This course addresses the issues associated with software quality. This course provides an in-depth exploration of designing, measuring, and maintaining the quality of a software artifact. Many software engineering topics are brought to bear on a systematic approach to ensure the quality delivered software (Software Quality Assurance, SQA). The student learns the issues associated with verification and validation, testing, audits, review of software artifacts, configuration management, and process improvement. The primary methods of assessing student learning are homework assignments, a presentation, a group project, a midterm, and final exam.

### **CPE 439 - Professional Awareness (1 cr.)**

Prerequisite: Graduating Senior Standing

This course is designed to make students aware of the problems, concerns, and responsibilities of an engineer as a professional. Students participate in discussions, led by invited speakers, on topics that enable students to write a professional résumé, interview for a job, generate an effective and substantive report, and make an effective technical oral presentation. Students are exposed to ethical issues in engineering environments, made aware of the necessity of protecting their work with patents, copyrights, trademarks, or trade secrets and of not infringing on the similar rights of others; and apprised of issues of safety in the work place, product liability, and the importance of professional registration. The assessment in this course is based on students' participation in discussions, the submission of short papers on some of the issues raised in the presentations, and the quality of project proposal and the oral presentation.

One class hour.

### **CPE 440 - Senior Design Projects (3 cr.)**

Prerequisite: CPE 439, CPE 436

This is a capstone design course that prepares students for entry-level positions. In this course each student works on an independent engineering project under the supervision of a faculty advisor. Students apply the design process and communicate the results of their project work in both oral and written form. Oral reports are presented before an assembly of faculty and students. Students apply engineering design principles either by working on a product, improving a product, or designing experiments to investigate causes of either an observed phenomenon or a problem in engineering. Students are required to demonstrate their achievements using appropriate laboratory exhibits. Students who select industry-sponsored projects have the opportunity of working with the industrial advisor in an actual engineering environment. The assessment in this course is based on the student's level of

commitment demonstrated throughout the semester, the level of achievement attained, the recording of activities in a log book, and the quality of the written report and oral presentation. Meeting hours by arrangement.

Distribution: MR

### **CPE 442 - Verification and Validation (3 cr.)**

Prerequisite: CPE 425/CPE 525 or equivalent.

This course introduces the student to software testing strategies and techniques. The goal is to provide a framework for the testing of the developed software in a series of well-planned steps. The cost impact of testing is illustrated in terms of effort, time, and resources. Students learn the issues associated with program proving, code inspection, test coverage, code reviews, unit-level testing, and system level testing. Students are exposed to the difficulty and costs of some types of analysis and testing. These are examined in addition to the need for automation of tedious tasks. The benefits of automated tests are explored as well as the associated costs. The advantages of regression tests are discussed. The primary methods of assessing student learning are homework assignments, a presentation, a group project, a midterm, and final exam.

### **CPE 450 - Topics in Compiler Design Theory (3 cr.)**

Prerequisite: CPE 310 and ENGR 105/HONE 105

This is a course in the theory and design of modern programming languages. Students learn the basic elements of a language translator (compiler); lexical analysis, parsing, code generation, symbol table management, type checking, scope resolution, code optimization, and error recovery. They also learn to write regular expressions and context free grammars and understand the separate phases of compilation and the issues involved in designing a medium sized translator. To facilitate student understanding, a semester-long, incremental design project is employed. As a result of building their own compiler, students learn the operation and messages presented by any modern commercial translator. The methods of assessing student learning in the course are homework assignments, quizzes, an exam, a research paper, and a semester long design project that culminates in a formal presentation.

Formerly "Design And Analysis Of Algorithms"

### **CPE 462 - VHDL: Simulation and Synthesis (3 cr.)**

Prerequisite: CPE 271 or equivalent.

Cross-Listed as: CPE 562

This project-oriented course covers the design of digital systems using VHSIC Hardware Description Language (VHDL), synthesizing the design, and mapping it onto hardware (Altera DE2-115 Field Programmable Gate Arrays (FPGA) boards). Students learn VHDL language to describe digital circuits and to write test bench for those descriptions for design verification. Students can distinguish synthesis coding versus simulation coding. Students will learn different coding styles, such as structural, data flow, and behavioral coding styles, as well as identify the differences. Students will use functions, procedures, components and generics to describe hardware. Students also acquire the skills to use Altera Quartus synthesis tools as well as the Altera Edition of the MultiSim simulator. The course provides a solid foundation for advanced work.

### **CPE 470 - Real-time Embedded Controls (3 cr.)**

Prerequisite: CPE 355 or concurrent or permission of the instructor.

This is an introductory course in the design and understanding of embedded micro-controllers in a time critical control application. Students learn the fundamentals of discrete systems modeling, analysis, and design. Students implement control algorithms on an embedded processor in the C language. Control issues associated with fixed-point processors, limited bandwidth I/O channels, and limited precision interfaces are studied. The methods for assessing student learning in the course are homework assignments, exams, and a design project.

Distribution: MR

### **CPE 475 - Operating Systems (3 cr.)**

Prerequisite: CPE 355 and CPE 420.

This is a first course in operating system theory and design. After successfully completing this course, students understand concurrent processes, process communication, resource allocation, and resource scheduling. In addition, they learn how to apply basic queuing models to predict real-time performance of an operating system. Students also learn the fundamentals of distributed (and network) operating systems. They also understand the interaction between operating system design and computer architectures. The methods of assessing student learning in this course are homework assignments, quizzes, classroom discussions, two exams, and a term project.

### **CPE 480 - Internship in Computer Engineering (3 cr.)**

See "Internships".

### **CPE 482 - Computer Engineering Research (1-3 cr.)**

Prerequisite: Junior or Senior Standing

See "Undergraduate Research" in catalogue.

Variable credits 1-3 cr.

### **CPE 485 - Computer Networks (3 cr.)**

Prerequisite: ENGR 212 or IE 212 or equivalent.

Cross-Listed as: CPE 585

This is a first course on communication networks. After completing this course, students understand the structure and issues of network design using the ISO Seven Layer model as a reference. They understand the limitations placed on specific network architectures from the physical (hardware) layer up through the upper layers (transport). The problems of error detection and recovery are also discussed. Students learn to use delay models to predict network specific performance measures and understand the limitations of these models. The course covers issues associated with routing and flow control. The methods of assessing student learning in the course are homework assignments, quizzes, three exams, and research paper with a formal presentation.

### **CPE 490-491 - Special Topics in Computer Engineering (3 cr.)**

This is a study of an advanced topic in engineering of special interest to electrical engineering majors, but not offered on a regular basis. The course may be repeated for credit if the topic varies.

## **CS - COMPUTER SCIENCE**

### **CS 101 - Introduction to Computing (4 cr.)**

Cross-Listed as: IT 101

This course is designed to introduce the student to various fields of computing in order to help them make an informed choice about which career path they would like to pursue. Topics include data representation, hardware, system and application software, communications and the systems development life cycle. Comparison of the computer science and information technology fields will be ongoing throughout the course.

Distribution: GUR/MR

Offered: in the fall semester

3 hours of lecture and 3 hours of lab per week.

This course is a prerequisite.

Laboratory fees \$50.

### **CS 102 - Introduction to Programming (4 cr.)**

Cross-Listed as: IT 102

Covers problem solving with programming. Students learn to apply fundamental imperative, procedural constructs to solve common programming problems, as well as the beginnings of object oriented programming (e.g., defining classes, instantiating objects, using objects, and using application programmer's interfaces). Students learn to design and develop small programs using a procedural, imperative programming language and appropriate analysis, design, and testing techniques.

Distribution: GUR/MR

Offered: in the spring semester.

This course is a prerequisite.

One cannot receive credit for CS 102 and CS 171 and BIS 300.

This course is equivalent to IT 102. 3 hours of lecture and 3 hours of lab per week.

Satisfies Computer Competence GUR

Laboratory fees \$50.

### **CS 131 - Computing for the Arts and Sciences (3 cr.)**

This is an introduction to computer systems, primarily from the user's viewpoint. Topics include hardware, software, vocabulary, and applications. The course culminates in a final project utilizing various software packages to research, analyze, and report on a topic of the student's choice.

Distribution: GUR

Offered: fall and spring semesters.

Not open to those who have completed CS 101, CS 133, or IT 101.

Satisfies Computer Competence GUR

Laboratory fees \$50.

### **CS 132 - Principles of Computing (3 cr.)**

This course is an introduction to the fundamentals of computing and its impact on modern society. Students learn about computing devices, components, networks, and systems; computational thinking,

including the roles of abstraction and algorithms in developing programs; and the interaction between computing and society, such as data privacy and the impact of algorithms in our daily lives. Students also get a brief introduction to programming as a means of analyzing data and/or creating models.

Distribution: GUR

Offered: fall and spring semesters.

Not open to those who have completed CS 101, CS 133, or IT 101.

Satisfies Computer Competence GUR

Laboratory fees \$50.

### **CS 133 - Introduction to Informatics (3 cr.)**

Informatics is the integration of computing and information management and its application in society. Frequently informatics focuses on applying information technology and tools to information from a discipline such as biology (bioinformatics), healthcare (healthcare informatics), nursing (nursing informatics), etc. This course will focus on how information technology can be used to organize and manage information in society. A project will be used to demonstrate student facility in informatics and students will present their work.

Distribution: GUR

Offered: fall and spring semesters

Not open to those who have taken CS 101, CS 102, CS 131, IT 101, or IT 102.

Laboratory fees \$50.

### **CS 170 - Technology in Mathematics (3 cr.)**

This course is an introduction to various computer software packages that can be useful for doing research, teaching, and working in the business world. Students will receive hands-on training in software packages including, but not limited to: computer algebra systems (Mathematica), Office products (Excel), and specialty math software (LaTeX).

Distribution: MR

Offered: in the spring semester.

Satisfies Computer Competence GUR

### **CS 171 - Programming for Mathematics (4 cr.)**

An introduction to computer programming with emphasis on using programming to solve problems in mathematics. Topics include variables, data types, control structures, arrays, simple graphics, functions and recursion. Students will also be introduced to software packages for mathematical computation.

Distribution: MR

Offered: in the Spring only, even years.

One cannot receive credit for CS 102 and CS 171.

Satisfies Computer Competence GUR

### **CS 190-191 - Special Topics in Computer Science (1 cr.)**

Topics in computer science that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **CS 200 - Data Structures (4 cr.)**

Prerequisite: CS 102 or IT 102 or CS 171

Cross-Listed as: IT 200

This course continues the introduction to computer programming begun in CS 102 or IT 102. This course covers the development and use of data structures in computer science and object-oriented software development. Using a modern programming language, students learn about the implementation and use of abstract data types. Students are expected to apply and augment the programming knowledge acquired in previous courses to the task of developing more complex works. Topics include linked lists, stacks, queues, hash tables, common trees and tree algorithms, graphs and traversal algorithms, and common algorithms related to these structures. Students will also learn to evaluate the efficiency of the algorithms that they implement over the course of the semester.

Distribution: MR

Offered: in the fall semester.

3 hours of lecture and 3 hours of lab per week

Lab Fee \$50.

### **CS 210 - Software Design (4 cr.)**

Prerequisite: CS 102 or IT 102, or CS 171

This course introduces software design concepts, standard software design notations, software architectures, and design patterns. Design notations will include data flow-oriented, object-oriented, data-oriented, and real-time approaches. Modularization of design patterns for software construction will be explored. Students will design and implement portions of a software system to demonstrate the use of design notations and design patterns.

Distribution: MR

Offered: in the spring semester.

3 hours of lecture and 3 hours of lab per week.

Laboratory fees \$50.

### **CS 220 - Software Development (4 cr.)**

Prerequisite: CS 102 or IT 102, or CS 171

Participants will learn modern tools and practices to design and develop large systems in teams such as integrated development environments, build systems, testing, version control, and issue tracking.

Distribution: MR

Offered: in the spring semester.

3 hours of lecture and 3 hours of lab per week.

Laboratory fees \$50.

### **CS 290 - Special Topics in Computer Science (1-3 cr.)**

Prerequisite: Permission of the instructor.

Topics in computer science that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

**CS 300 - Digital Forensics I (3 cr.)**

Prerequisite: CS 101 or IT 101 or CS 132, and Junior or Senior standing, or instructor's permission.

This course explores methods for conducting digital forensic investigations, including how to obtain, analyze, reconstruct, and report on evidence. Students will examine various techniques that actors employ to compromise data and perform root cause analysis, to understand the tools and methods used during the breach. Students will also explore how to prevent these intrusions from occurring using security measures.

Only one of, CS 300 and CS 310, may be counted as a technical elective in the Computer Science degree program.

Formerly Computer Forensics, Tools and Processes

**CS 310 - Digital Forensics II (3 cr.)**

Prerequisite: CS 300

This course covers digital forensics incident response with a focus on containment, remediation, and recovery. Students will review evidence, prepare and document incidents using forensic tools, while continuing to focus on security techniques.

Only one of, CS 300 and CS 310, may be counted as a technical elective in the Computer Science degree program.

Formerly Computer Crime Scene Investigation

**CS 333 - Independent Study in Computer Science (1-3 cr.)**

See "Independent Study".

**CS 334 - Independent Study in Computer Science (1-3 cr.)**

See "Independent Study".

**CS 340 - Computer Graphics: Principles and Applications (3 cr.)**

Prerequisite: CS 200/IT 200 or permission of instructor

This course focuses on rendering the synthesis of realistic 3D images, the major concern in computer graphics today. Following a study of light, color, and shading, each student develops a simple program to generate images using ray-tracing, the most widely used photo-realistic rendering technique. Additional topics include 2D and 3D transformations, generation of 2D images on a screen, use of a simple 2D graphics package, and graphical user interfaces.

Offered: in alternate fall semesters.

**CS 351 - Programming Languages (3 cr.)**

Prerequisite: CS 200/IT 200, CS 210 or permission of the instructor.

Students will study fundamental concepts related to the design and implementation of programming languages. Topics typically include lexical, syntactic, and semantic analysis; functional, procedural, object-oriented, and logical programming paradigms; call semantics; dynamic vs static scoping; and type systems.

Distribution: MR

Offered: in fall semester

Formerly "Organization of Programming Languages"

Formerly "Programming Paradigms"

**CS 364 - Design of Database Management Systems (3 cr.)**

Prerequisite: CS 102 or IT 102 or CS 171

This is a study of concepts, theory, design techniques, and retrieval methods, particularly using the industry-standard SQL data language. Topics include physical data organization, database architecture, data models with emphasis on the relational model, logical database design, normalization, and relational query languages. A design and an implementation project are required.

Distribution: MR

Offered: in the spring semester

Cannot receive credit for CS 364 and IT 300/BIS 321.

**CS 366 - Design and Analysis of Algorithms (3 cr.)**

Prerequisite: CS 200/IT 200, CS 210 or permission of instructor.

This course provides students with the fundamental techniques and strategies used in the design of algorithms, including proper selection of data structures, dynamic programming, divide-and-conquer, greedy methods, and backtracking. The course also exposes students to the analysis of algorithms using methods to estimate run-time performance. The theory of NP-completeness is discussed, along with heuristic methods for constructing algorithms for "hard problems." Numerous case studies give students perspective into how algorithm problems arise in the real world.

Distribution: MR

Offered: in the fall semester

**CS 370 - Artificial Intelligence (3 cr.)**

Prerequisite: Junior standing, and CS 200 or IT 200, or permission of the instructor.

This course is a survey of artificial intelligence (AI) including fundamental ideas, techniques, and applications in the field. Topics covered include search, game playing, constraint satisfaction, planning, and machine learning. Students complete multiple projects on these topics using a modern programming language. Students must also research an advanced topic in artificial intelligence, completing a research paper and/or presentation.

Offered: in alternate years.

Formerly "Artificial Intelligence and Expert Systems"

**CS 390-391 - Special Topics in Computer Science (1-3 cr.)**

Topics offered depend upon student interest as well as particular interests of instructors. The course is offered as often as faculty time and student interest permit and may be repeated for credit if the topic differs.

**CS 413 - Parallel Computing (3 cr.)**

Prerequisite: CS 200 or IT 200

This course introduces students to the fundamentals of parallel computing with a focus on approaches appropriate for multicore

architectures. Topics include parallel architectures, algorithms and programming paradigms, shared- and distributed-memory systems, message passing, graph and matrix algorithms. Cloud computing, synchronization techniques, shared data structures, and load balancing will also be covered.

Distribution: MR

Offered: in the fall semester

### **CS 480 - Internship in Computer Science (1-3 cr.)**

See "Internships".

### **CS 481 - Internship in Computer Science (1-3 cr.)**

See "Internships".

### **CS 490 - Software Engineering (3 cr.)**

Prerequisite: CS 200/IT 200, CS 210, CS 220, and Senior standing.

This is a software engineering course studying principles, methods, and ethical aspects of software engineering and featuring a large-scale software engineering project.

Distribution: MR

Offered: in the fall semester.

### **CS 491 - Special Topics in Computer Science (3 cr.)**

Topics offered depend upon student interest as well as particular interests of instructors. The course is offered as often as faculty time and student interest permit and may be repeated for credit if the topic differs.

### **CS 492 - Computer Science Capstone (3 cr.)**

Prerequisite: CS 490

This project-based course provides students the opportunity to demonstrate their ability to synthesize and apply knowledge and skills acquired throughout the computer science program. Using appropriate software engineering practices, students will work in teams to substantially contribute to a significant, real world, software project.

Distribution: MR

Offered: in the spring semester.

## **CUL - GLOBAL CULTURES**

### **CUL 210 - Comparative Race Relations: U.S. and South Africa (3 cr.)**

Prerequisite: Sophomore standing.

This course compares the experience of the United States and South Africa from the colonization by Europeans to the Civil Rights successes in the U.S. and the end of Apartheid in South Africa. We will study the literature, religious issues, political conflicts, and historical experience of these two cultures through the prism of race relations. We will study the works and lives of, among others, Malcolm X, Nelson Mandela, Stephen Biko, and Martin Luther King, as well as the political and economic realities which constrained and were changed by these individuals' activities.

Satisfies Elements of Culture requirement "C".

Formerly CUL 310.

### **CUL 215 - British Culture & Society (3 cr.)**

Prerequisite: Sophomore standing.

This course provides an introduction to modern British culture and society from the Victorian period to the present. The goal of the course is to explore the different elements that make up British culture, to understand that culture in its social context, and to consider how and why cultural values can change over time. We will examine specific examples of both popular culture (film, newspapers, pop music) and high culture (art, literature, drama) as we proceed.

Satisfies Elements of Culture requirement "CA".

This course is taught in London as part of the London Study Abroad program.

### **CUL 216 - Culture of English Villages in Fact and Fiction (3 cr.)**

Prerequisite: Sophomore standing.

Thoughts of England conjure images of a village green, a cricket pitch, the spire of a church, the village hall, and, of course, the local pub. These are the settings for an annual cycle of cultural traditions: village fêtes, cricket matches, flower and produce shows, bonfire nights, Remembrance Day services, and the Christmas pantomime.

A feeling of connectedness rooted in small communities is at the center of these traditions. The strong sense of place and tradition that marks village life unfolds, however, against a changing set of economic and demographic factors. Farms remain a key source of employment in rural England, and they face an uncertain future in terms of trade and subsidies because of Brexit. Significant population shifts also have left their mark, with an influx of urban dwellers, as well as immigrants from South Asia and Eastern Europe who bring their own traditions to these communities.

This course will explore the rich and evolving culture of English villages and the culture's enduring significance in daily life, both in fact and fiction. The fictional aspect comes courtesy of *The Archers*, a 13-minute daily BBC radio drama that has depicted English village life in nearly 19,000 episodes since the program's premiere on local radio in the Midlands in 1950 and nationally on the BBC Home Service in 1951. The course will explore the cultural phenomenon that is *The Archers*, with its weekly audience of five million listeners in the UK and millions more online around the world, as well as the current renaissance of "audio drama" through podcasts.

This course is designed to meet the Elements of Culture "CA" requirement.

Satisfies Elements of Culture requirement "C".

### **CUL 218 - Discovering Nigeria: The Giant of Africa (3 cr.)**

Prerequisite: Sophomore standing.

In this course, we will focus our attention on the diverse peoples and experiences of Nigeria. We will examine this important nation's background through a survey of its history, cultural patterns of religious belief and language, as well as appreciating distinctive contributions in the arts, music, literature, cuisine, and sports. Finally,

we will develop and understanding the contemporary status of Nigeria as it faces the challenges of the 21st Century through a survey of the country's economy, government, and a variety of contemporary issues that are both domestic and international in scope.

The primary goal of the course is for students to acquire an understanding of the culture and life of the people of Nigeria. Students will come to appreciate unique aspects of Nigeria, while also seeing the similarities between Nigerian culture and wider African patterns and in the Developing World, as well as comparisons with American culture and society. In the end, your instructor hopes that this semester-long experience will equip you with more developed intercultural skills that will be of value in whatever part of the world you choose to pursue a career, do business, and/or travel.

Satisfies Elements of Culture requirement "C".

### **CUL 220 - Discovering India (3 cr.)**

Prerequisite: Sophomore standing.

India is the second largest country in the world by population and the world's largest democracy, besides being one of the most diverse and pluralistic nations in the world in terms of languages, cultures, religions, and social identities.

This course will provide a broad-ranging introduction to contemporary India, set in a historical and cultural context. Using Indian literature, film ("Bollywood"), art and architecture, and food, in addition to scholarly writing, the course will examine the key social, political, and economic issues that have faced India since independence, and the challenges she confronts in the 21st century. Because India always has, and still continues, to exercise considerable influence ("soft power") on the world, the course will also examine India's role in the world-with particular emphasis on the relationship between India and the United States: the influence of Vedanta on Emerson and Thoreau, the influence of Thoreau on Gandhi, and the influence of Gandhi and the Indian freedom struggle on Martin Luther King, Jr and the US Civil Rights movement. -

Satisfies Elements of Culture requirement "C".

Satisfies Elements of Culture requirement "C".

### **CUL 222 - Southeast Asia (3 cr.)**

Prerequisite: Sophomore standing.

This course will cover the countries of Indonesia, Thailand, the Philippines, Vietnam, Laos, and Cambodia. We will consider the geography of the area- the consequences of being east of India and south of China, as well as issues affecting the environment and natural resources of this region; its history, essential points of nation formation, and the transitions from traditional to modern societies and governments; its economics, comparing the situation and policies before World War II to those afterwards, looking at traditional production techniques, and examining the effects of the present financial crisis; its cultures, the intersections of art, language, literature, music, drama, ethnicity, and religion; and social and political issues, such as the causes and impact of migration within and across the region, and ethnic and political conflicts.

Satisfies Elements of Culture requirement "CA".

### **CUL 223 - Modern Germany (3 cr.)**

Prerequisite: Sophomore standing.

This course introduces students to the culture of modern Germany from its unification in 1871 under Bismarck to the fall of the Berlin Wall and the reunification of East and West Germany.

Satisfies Elements of Culture requirement "CA".

### **CUL 224 - Italian Culture (3 cr.)**

Prerequisite: Sophomore standing.

Since the rise and fall of the Roman Empire, a wide range of historical and political events have manifested transformations leading up to the Unification of Italy in 1861. The demographic, economic, sociological differences and complexities leave Italians still attempting to establish a national identity. This course will provide students with an understanding of ancient and modern Italy, Italian culture, and the Italians. Students will immediately connect American multicultural challenges and diversity as a way of life for Italians for several centuries leading up to today. In addition, the course challenges students to engage in other ways of knowing, thinking, and rethinking about culture and Italy.

Italian Culture will cover political, historical and cultural questions, regionalism, linguistic variations, governance, social and political cultures, mafia and corruption, religion, literature, art, media, music, and film. In addition, students will explore Italian migration from the 1800s to 1970s, and contemporary Italy's recent immigration challenges in a multicultural world.

Satisfies Elements of Culture requirement "C".

### **CUL 225 - Chinese Culture and Society (3 cr.)**

Prerequisite: Sophomore standing.

This culture course about China examines how Chinese culture and society develop as a result of the interaction of historical, geographic, economic, philosophical, political and religious factors, and consider how those factors may be reflected in a culture's tradition. The thematic overview in the Chinese culture course might focus on the development of a cultural civilization and how that has developed over the last and contemporary century.

Satisfies Elements of Culture requirement "C".

### **CUL 230 - Culture of Iran (3 cr.)**

Prerequisite: Sophomore standing.

As the 21st century progresses, the necessity to understand and appreciate other cultures around the globe has grown. This increased need is related to the fact that interactions between people from different cultures have increased profoundly, and will probably continue to increase in frequency. This increase in intercultural interactions has occurred in part because of changes in technology, political systems, immigration patterns, and the global economy.

In this course, we will focus on the culture(s) of Iran, and Iranian interactions with the rest of the world. In order to do this, we will examine the following areas of the Iranian experience: cultural history, cultural patterns, world view, religion, language, education, art, architecture, poetry/literature, economics, politics/government, and contemporary issues in Iran.

Satisfies Elements of Culture requirement "C".

This course is offered as a hybrid, mixing some online weeks with weeks of traditional on-campus class meetings.

### **CUL 231 - Music (Sub)Cultures in the US & UK (3 cr.)**

Cross-Listed as: SO 231

This course examines the historical emergence, socio-political worldviews, and material output of various musical subcultures in the United States and the United Kingdom. An integral aspect of all subcultures is the concept of resistance: the styles of these subcultures can be understood as representing a symbolic challenge to the prevailing social/cultural order. Course participants will be introduced to the Sociological analysis of culture (and subculture) by comparing a series of examples in the US and the UK: punk, hip-hop, heavy metal, reggae, jazz, and folk. These cases further allow us to explore the relationship between race, socio-economic class, and global politics in both countries.

Satisfies Elements of Culture requirement "CA."

### **CUL 232 - Czech Republic: Culture & History (3 cr.)**

Prerequisite: Sophomore standing

This course is a semester-long immersion into Czech history and culture. We will explore political history, economic forces, and the arts as intertextual dispositions that have given rise to the modern-day Czech Republic. Through a wide-ranging collection of readings and films students will analyze the many struggles and triumphs that have forged the Czech national identity.

This course satisfies the Elements of Culture requirement, "CA."

Satisfies Elements of Culture requirement "CA."

### **CUL 235 - The United States and International Perspectives (3 cr.)**

Prerequisite: ENGL 100 or equivalent.

Open only to nonnative speakers of English.

Satisfies Elements of Culture requirement "CA."

### **CUL 240 - Latin American Youth in Revolt: Young People and Counterculture in Latin American Cinema (3 cr.)**

Prerequisite: Sophomore standing.

This course will focus on the role played by young people in the production and dissemination of film in Hispanic countries and communities. In this course, students will be introduced to a number of films from various Spanish and Lusophone countries and perspectives. As part of this learning process, the course will interrogate what it means to be a young person and how youth has played an integral role in the construction and deconstruction of economics, politics, and social life within this region. Throughout the course, students will be encouraged to engage critically with these films to identify the techniques or "visual language" being utilized to critique society and challenge simplistic outlooks on identity and political participation.

Class time will revolve around a set of discussion questions and thematic readings related to weekly film screenings.

Satisfies Elements of Culture requirement "CA".

### **CUL 243 - Irish Culture (3 cr.)**

Prerequisite: Sophomore standing.

"Each community defines itself as much by what it is as by what it is not, and what it is not, is, above all else, the other."-Michael McDonald, *Children of Wrath: Political Violence in Northern Ireland*. The dilemma in studying Irish culture is that not just one culture exists; colonization has led to the creation of multiple cultures and identities in Ireland. The two dominant cultures in Ireland are at odds over every aspect of a perceived "national identity." What is "Irish"? Who defines a culture? If no consensus exists, how does a culture survive? Mythology, literature, music, and political symbolism are the main tools utilized by all in Ireland who attempt to create or define their culture. In this course we will explore the creation of cultures and identities in Ireland by examining Irish history, literature, music, and symbolism. We will also look at the very different perception of Irish culture created in the United States.

Satisfies Elements of Culture requirement "C".

### **CUL 246 - Modern Israel (3 cr.)**

Prerequisite: Sophomore standing.

This course's objective is to understand the historical, political, economic, religious, and cultural dimensions of modern Israel and to examine these themes among others: the establishment of the state, its survival, the role of the Holocaust, and the role of art.

Satisfies Elements of Culture requirement "C."

### **CUL 248 - Russia Then and Now (3 cr.)**

Prerequisite: Sophomore standing.

Satisfies Elements of Culture requirement "C."

### **CUL 250 - Latin American Civilization (3 cr.)**

Prerequisite: Sophomore standing.

The objective of the course is to introduce the student to the rich cultural heritage of the peoples who have contributed toward forming the societies of Latin America. Attention will be given to the Indigenous, Spanish, Portuguese, and African populations. The course will examine Latin America from the perspectives of its environment, history, society, and higher thought (philosophy/religion). The student will be introduced to the geographical diversity and resources of Latin America. There will be discussion of the historical development of Latin America, dating back to pre-Columbian times. Comparisons will be made in the discussions with the historical and societal development of the United States. Comparisons will also be made among the diverse societies that comprise Latin America.

Satisfies Elements of Culture requirement "CA."

### **CUL 253 - Cuban Cultures (3 cr.)**

Prerequisite: Sophomore standing.

In December of 2014, President Barack Obama announced the first step towards normalizing diplomatic relations with one of the United States of America's closest geographical neighbors: Cuba. Despite the mere 90 miles separating that nation from the tip of Florida, the interactions between Cuba and the United States—and the rest of the world—have been fraught with conflict ever since Christopher Columbus landed on the island in 1492. This course will examine the



complex history and present of Cuba, to the post-colonial era, to the Cuban Revolution, to the fall of the Soviet Union, and finally to the present day. Through close readings of primary historical texts, Cuban literature and film, and political and cultural criticism, we will attempt to understand how Cubans of all kinds have defined themselves over the years, how the aesthetics of cinema inform that process, and finally, how this relatively small nation has left such an indelible mark on global politics.

Satisfies Elements of Culture requirement "CA."

### **CUL 255 - African American and Caribbean Cultures (3 cr.)**

Prerequisite: Sophomore standing.

In his seminal piece, "Africa for the Africans" (1920) Marcus Garvey suggested that there was no difference between Blacks in the United States and Blacks in the Caribbean. He suggested that both African Americans and Caribbean peoples maintain the same heritage and culture despite the fact that each group occupied/s different nation spaces. This course will explore to what extent Garvey's assertion is applicable; how similar is the Black culture of the United States to that of the Caribbean. This course will provide information about the major aspects of both cultures: religion(s), philosophy, ethical principles, literature, government, economy, arts, customs, traditions, and ways of life.

Satisfies Elements of Culture requirement "CA."

### **CUL 260 - Japan (3 cr.)**

Prerequisite: Sophomore standing.

As we start the 21st century, worldwide interest in global cultures has grown. Interactions between people from different cultures have increased profoundly because of changes in technology, political systems, immigration patterns, and the global economy. In this course, we will focus on the culture of Japan, and its interactions with the United States, examining the following areas of the Japanese experience: cultural history, cultural patterns, world view, religion, language, education, art, architecture, drama, traditional sports, and contemporary issues in Japan.

Satisfies Elements of Culture requirement "CA."

### **CUL 261 - Australia and New Zealand (3 cr.)**

Prerequisite: Sophomore standing.

This course examines the impacts of three waves of colonization to Australia and New Zealand—the development of plants and animals in isolation, the first arrivals of Australian Aboriginals and New Zealand Maori, and the settlements of European prisoners, whalers, missionaries, pastoralists, and gold miners.

Satisfies Elements of Culture requirement "CA."

### **CUL 263 - France and French Caribbean Culture (3 cr.)**

Prerequisite: Sophomore standing.

This course introduces the students to the politics and culture of France and their influence on the Francophone Antilles. The course includes the geography and a capsulated history of France, as well as that of Haiti, French Guiana, Martinique, and Guadeloupe. Much emphasis is placed on the impact of the French Revolution of 1789 on the Haitian Independence movement, and the political ramifications in Guadeloupe, Martinique, and French Guiana. The course attempts to compare and contrast the differences between the African and French influences in these countries, socially and

economically, and examines the effects of these disparities as reflected in their music, art, and literature.

Satisfies Elements of Culture requirement "CA."

### **CUL 273 - East Africa (3 cr.)**

Prerequisite: Sophomore standing.

This course discusses pre-colonial, colonial, and post-colonial history, traditional cultures (art, religion, and customs), political organizations, and literature of East Africa. Until recently, East Africa included the following former British territories: Kenya, Tanzania, and Uganda. Today that geographic area includes also two former Belgian territories: Burundi and Rwanda. The East Africa course will focus on a particular country or a comparison of two countries in East Africa. In the Rwanda focus, for example, Rwanda will be used as a case study to illustrate the impact of colonialism on African societies and the increasing importance of human rights in international relations. At other times, the course may focus on Swahili culture in general, or on some other aspect of East Africa.

Satisfies Elements of Culture requirement "C".

### **CUL 276 - Spain: Nation and Culture (3 cr.)**

Prerequisite: Sophomore standing

Cross-Listed as: HIST 276

What does it mean to be "Spanish"? This course aims to help students understand this complicated and much-debated question by exploring the diverse cultures and politics of culture that define modern Spain. From a hinterland of the Roman Empire, the region transformed dramatically with 700 years of Islamic rule, 500 years of Catholic monarchy and global empire, a devastating civil war, Franco's 40-year dictatorship, and the return to democracy in the 1970s. We trace how events, interactions, and cultural issues from Spain's past shape the present: religions, gender and family roles, political values, ethnic identities, immigration, and controversies about iconic traditions like bullfighting and flamenco.

Satisfies the Elements of Culture (C) and the History (HIST) requirement for Business and Engineering; satisfies the Global Cultures (CUL) requirement and the History requirement (HIST) for Arts & Sciences.

A&S students who take this course to meet the CUL and HIST requirements will need to complete an additional 3-credits of general electives.

### **CUL 277 - Colombia: Nation and Culture (3 cr.)**

Prerequisite: Sophomore standing

Cross-Listed as: HIST 277

Colombia is a complex country of cultural, ethnic, and ecological diversity. This course introduces students to the indigenous, Spanish, and African foundations of modern Colombia's multi-ethnic regional identities. Using scholarship, memoirs, art, and film, we examine Colombians' responses to uneven development, inequality, political conflict, and violence to learn how they have created meaningful ways of life despite these challenges. Topics include: customs, values, and religion; arts, music, and sports; land, labor, and exports (gold, coffee, bananas, flowers, cocaine); violence, displacement, and human rights.

Satisfies Elements of Culture requirement "C" or the Historical Perspective.

**CUL 290-299 - Special Topics in Cultures (3 cr.)**

Prerequisite: Sophomore standing.

Topics that are not offered on a regular basis are examined. Recent topics have been China, Southeast Asia, and a travel course to Italy and the low countries. The course may be repeated for credit if the topic varies.

Satisfies Elements of Culture requirement "C".

May satisfy Elements of Culture requirement "CA" depending on topic.

**CUL 315 - International Practicum (3 cr.)**

Prerequisite: Sophomore standing and consent of instructor.

Cross-Listed as: BUS 315

International Practicum involves pre-travel study and travel of 10-14 days duration during school breaks that are chaperoned and supervised by a business faculty member. These trips take students outside the geographic borders of the U.S. and provide learning experiences beyond the classroom environment. Programs and activities enhance the ability of students to comprehend, analyze, and grasp different cultural aspects that impact successful management of organizations in the global work environment. The major goal of the International Practicum is to allow undergraduate students opportunities to enhance their understanding of cross-cultural differences and the globalization of the work environment. The course may be repeated for credit if the location/topic varies.

Satisfies Elements of Culture requirement "CA".

**CUL 333 - Independent Study in Cultures (1-3 cr.)**

See "Independent Study".

**CUL 334 - Independent Study in Cultures (1-3 cr.)**

See "Independent Study".

**CUL 390-391 - Special Topics in Cultures (1-3 cr.)**

Prerequisite: Junior standing.

Topics that are not offered on a regular basis. The course may be repeated for credit if the topic varies.

Satisfies Elements of Culture requirement "C".

**EC - ECONOMICS****EC 101 - Introduction to Economic Issues (3 cr.)**

This is an exploratory, relatively non-technical examination of some important economic issues. The workings of markets are explained using supply and demand analysis. Students are introduced to the issues of inflation, unemployment, fiscal and monetary policy, international trade, the environment, and poverty.

Not open to students who have completed EC 111.

Does not satisfy Economics requirements in School of Business and Engineering.

**EC 105 - The Economics of Crime (3 cr.)**

This course does not satisfy the economics requirement in the Colleges of Business and Engineering. This is an examination at the very basic introductory level of the market relationship between the

amount of crime and the money spent on crime prevention and protection. A basic issue discussed in the course is that given limited resources and an obvious recognition that crime imposes an economic cost, society must make choices involving the trade-off between the economic costs of crime and the costs of purchasing more crime protection. The opportunity cost principle is used to illuminate this and other issues including the impact of criminal activity on the Gross Domestic Product and the impact of changing the legal status of certain goods and services.

**EC 106 - The Economics of Poverty and Discrimination (3 cr.)**

This course does not satisfy the economics requirement in the Colleges of Business and Engineering. This is an introduction to the economic analysis of the problems of poverty and gender and race discrimination in the United States. Competing analytical perspectives are presented and evaluated. The course covers, among other topics, the analysis of government policies such as income maintenance, minimum wages, Affirmative Action, and education policies.

Distribution: MR

This course is a prerequisite.

**EC 111 - Principles of Microeconomics (3 cr.)**

This course introduces students to economic principles, beginning with the issue of scarcity and choice and building to an understanding of microeconomics. Topics include characteristics of the American private enterprise economy; markets, the price system, and the allocation of resources-including the different market structures in American industry; the labor market; the role of government when social costs and private costs diverge; and the distribution of income.

Distribution: A&SR/BUSR/GUR/MR

This course is a prerequisite.

Formerly EC 201.

Not open to students who have taken EC 117 or EC 206.

**EC 112 - Principles of Macroeconomics (3 cr.)**

Prerequisite: EC 111.

This course continues the coverage of basic economic principles. Most of the course will focus on the economy as a whole-on macroeconomics. Topics include National Income Accounting, unemployment and inflation, money and banking, the issue of government deficits and the national debt, economic growth, and international trade and finance.

Distribution: BUSR/MR

This course is a prerequisite.

Formerly EC 202.

Not open to students who have completed EC 117 or EC 205.

**EC 117 - Principles of Quantitative Economics (3 cr.)**

Prerequisite: MATH 133 or MATH 123 or equivalent.

This course is a calculus-based introduction to economic principles, both macro and micro. All topics will be elucidated mathematically. Topics include characteristics of the American private enterprise economy; markets, the price system, and the allocation of resources, including the different market structures in American industry. The

course will also cover national income accounting, macroeconomic equilibrium, and fiscal and monetary policy issues.

Formerly EC 207.

Not open to those who have taken EC 111 or EC 112 or EC 201 or EC 202.

### **EC 190 - Special Topics in Economics (1-3 cr.)**

Topics in economics that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **EC 215 - Intermediate Macroeconomics (3 cr.)**

Prerequisite: EC 202 or EC 112 or EC207 or EC 117 and MATH 111 or MATH 123 or MATH 133.

This is a theoretical and applicational view of aggregative economics. A survey of Classical, Keynesian, and neo-Keynesian theory leads into a study of macroeconomics and economic policies, particularly in the United States. Emphasis is on current national economic goals and the macro dynamics of inflation, growth, investment, and consumption as well as the problem. Public policies to promote economic stability and growth are discussed in detail.

Distribution: MR

Formerly EC 305.

### **EC 216 - Intermediate Microeconomics (3 cr.)**

Prerequisite: EC 112 or EC 117 or EC 111 and MATH 111 or MATH 123 or MATH 133.

This is an intermediate course in economics covering the theoretical bases used by economists in explaining the behavioral patterns of consumers, firms, and industries. Problems, readings, and discussions are directed to the logical development, understanding, and application of theoretical models and concepts rather than pure exposition of static analysis.

Distribution: MR

Formerly EC 306.

### **EC 219 - American Economic History (3 cr.)**

Prerequisite: EC 112 or EC 106 or EC 117.

This is a problem-oriented approach to American economic history. Specific problems studied in depth vary, but have included the economic experience of Black America, the agricultural problems of the post-Civil War years, Southern economic history, the rise of the industrial giants, and the causes and consequences of the Great Depression.

Formerly EC 316.

### **EC 230 - Business and the Global Environment (3 cr.)**

Prerequisite: Sophomore standing

Cross-Listed as: ILP 230

This course focuses on political, cultural, economic, and social elements related to globalization of the business environment and covers a broad spectrum of issues. Learning outcomes are focused on the recognition and understanding of concepts and practices with respect to: the nature of regional economic integration; theories of international trade; the organization of global firms; cross-cultural marketing issues; international legal frameworks and trade organizations; and ethics and social responsibility.

Not open to students who have completed ILP 230.

### **EC 240 - Football Without Helmets: Soccer and Rugby (3 cr.)**

Prerequisite: Sophomore standing

Cross-Listed as: ILP 240

This course examines two of the most popular professional team sports in the UK, football and rugby, focusing on the structural, cultural, and economics aspects of these two sports and on the differences and similarities to the four major US professional team sports leagues. Topics include, league structure, labor markets including the transfer market, relegation and promotion, and team objectives. No prior knowledge of the sports covered is necessary.

Not open to students who have completed ILP 240.

### **EC 251 - The Economics of Social Policy: Deciding How Your Money Is Spent (3 cr.)**

Prerequisite: Sophomore standing

This course examines how economic theory assists in examining and explaining the social policy choices we all make as citizens. This course will cover policy issues such as welfare reform, healthcare, Social Security, and immigration and their relationship with macro economics.

### **EC 290 - Special Topics in Economics (1-3 cr.)**

Prerequisite: EC 117 or EC 207.

Topics in economics that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **EC 311 - Money and Banking (3 cr.)**

Prerequisite: EC 112 or EC 117, MATH 111 or equivalent.

This is a study of the role of money, credit, and financial institutions in the U.S. economy. Topics include policies concerning depository institutions, the role of the Federal Reserve System, and monetary theory.

Distribution: MR

### **EC 315 - Comparative Economic Systems (3 cr.)**

Prerequisite: EC 101 or EC 111.

This is a study of capitalism and socialism including theoretical interpretations of these systems. Case studies include descriptions of the mixed capitalist economies of the United States and Western Europe and the transitional economies of the former Soviet Union, China, and Eastern Europe.

Distribution: MR

Offered: in alternate years.

### **EC 317 - Management Issues for Professionals (3 cr.)**

Prerequisite: MATH 111 or MATH 123 or MATH 133

Cross-Listed as: ILP 317

Managerial economics is part of the education of managers, engineers, and other professionals who are involved in decision-making. It provides a framework for assembling information and analyzing alternative decisions. The principle problems studied are those of optimization, forecasting, risk avoidance, and business decision making. Its principle tools are drawn from economic theory

and statistics. Calculus and numerical calculations are used to develop and analyze the data that theory has demonstrated to be relevant.

Distribution: MR

Not open to students who have completed ILP 317.

### **EC 321 - Economic Development (3 cr.)**

Prerequisite: EC 111 or EC 117.

This is an analysis of the characteristics and causes of underdevelopment in poor nations and of programs designed to stimulate economic growth.

Distribution: MR

Offered: in alternate years.

### **EC 333 - Independent Study in Economics (1-3 cr.)**

See "Independent Study".

### **EC 334 - Independent Study in Economics (1-3 cr.)**

See "Independent Study".

### **EC 340 - The Economics of Sports (3 cr.)**

Prerequisite: EC 111 or EC 105 or EC 117 or EC 207.

This course applies the tools of economic theory to the market for professional sports entertainment. The course examines the market structure of the professional sports industry. Its principle tools are drawn from existing economic models that are used to examine both the hiring of athletes and selling the entertainment product. Issues in the industry that are analyzed include variable and dynamic ticket pricing, revenue sharing and competitive balance, wage determination models, salary caps, free agency, and the government's role in the professional sports industry.

Distribution: MR

### **EC 345 - The Pharmaceutical Business Environment (3 cr.)**

Prerequisite: Sophomore standing, EC 101 or EC 111 or EC 117.

This course will provide a basic overview of the pharmaceutical industry, and will include discussion of the market structure and competitive environment, government policy, and the legal/regulatory environment.

Distribution: MR

### **EC 350 - Economics of Arts and Entertainment (3 cr.)**

Prerequisite: EC 111 or EC 105 or EC 106 or EC 117.

This course applies the tools of economic theory to an analysis of the arts and entertainment industry. Key learning outcomes focus on the nature of supply and demand for art and artistic services, the contribution of the arts and entertainment sector to the economy, the economic functions of artists, the role of the nonprofit sector, and the role of public policy in providing a basis for cultural activities and organizations.

Distribution: BUSR/MR

### **EC 351 - Economics and Government (3 cr.)**

Prerequisite: EC 111 or EC 117.

This course is a critical examination of the role of governments in free enterprise economies. Topics include the history of governmental intervention in business, industry, and finance; major current economic problems; and the method and degree of government action proposed to resolve economic problems.

Offered: in alternate years.

### **EC 355 - Public Finance (3 cr.)**

Prerequisite: EC 112 or EC 117.

This course studies the effects of government expenditure, borrowing, and taxation upon resource allocation, national income, employment, and income distribution. Special emphasis is placed on the appropriate types of taxation and current and recent government budgetary choices.

Distribution: MR

Offered: in alternate years.

### **EC 361 - Urban Economics (3 cr.)**

Prerequisite: EC 111 or EC 117.

This course is a study of the economic aspects of the social and political problems of the modern American city.

Offered: in alternate years.

### **EC 366 - Labor Economics and Human Capital (3 cr.)**

Prerequisite: EC 111, EC 101 or EC 106

The object of the course is to educate students about the general characteristics of the labor market. In particular, students will learn how choices are made in labor markets and why individuals engage in work behavior. Students will be familiar with various human capital theories, in particular with how education, skills, and training help individuals enhance their earning potentials, and finally with the role of unions in labor markets.

Offered: in alternate years.

### **EC 371 - International Monetary Economics (3 cr.)**

Prerequisite: EC 112 or EC 117.

This is an analysis of the balance of payments and the foreign exchange market including the theory of payments adjustment and policies to attain domestic international balance. The course examines the roles of the dollar, other currencies, and the International Monetary Fund in the process of international monetary reform.

Distribution: MR

### **EC 372 - International Trade (3 cr.)**

Prerequisite: EC 111 or EC 117.

This course studies the theory and practice of international trade and investment. Topics include comparative advantage, determination of the pattern of trade, current problems of commercial policy and trade negotiations, the role of the multinational corporation, and the theory of economic integration with special reference to the European Union.

Distribution: MR

Offered: in alternate years.

### **EC 374 - Environmental Economics (3 cr.)**

Prerequisite: EC 101 or EC 111 or EC 117.

This course examines the economic aspects of current environmental and natural resource issues. The problems of pollution control and resource management are examined from an economic perspective. Other topics may include the global population problem; energy dependence and the economy; the economics of recycling; and the impact of environmental policy on growth, jobs, and the quality of life.

Distribution: MR

Offered: in alternate years.

Formerly EC 274

### **EC 386 - Econometrics (3 cr.)**

Prerequisite: EC 111 or EC 112 and MATH 111 or MATH 123; or MATH 133 and BIS 220; or MATH 120, or PSY 207.

This course covers methods of detecting and means of remedying violations of the assumptions of classical regression analysis. While only economic models are discussed, the methodology is multidisciplinary in nature.

Laboratory fees \$50.

### **EC 390 - Special Topics in Economics (1-3 cr.)**

Prerequisite: Varies according to nature of course.

Topics offered depend upon student interest as well as particular interests of instructors. The course is offered as often as faculty time and student interest permit. Recent topics have included The Economics of Work and Pay, The Economics of Election Issues, Women in the Economy, and Great Ideas in Economics. May be repeated for credit if the topic differs.

### **EC 392 - Special Topics in Economics (1-3 cr.)**

Prerequisite: Varies according to nature of course.

Topics offered depend upon student interest as well as particular interests of instructors. The course is offered as often as faculty time and student interest permit. Recent topics have included The Economics of Work and Pay, The Economics of Election Issues, Women in the Economy, and Great Ideas in Economics. May be repeated for credit if the topic differs.

### **EC 394 - Special Topics in Economics (1-3 cr.)**

Prerequisite: Varies according to nature of course.

Topics offered depend upon student interest as well as particular interests of instructors. The course is offered as often as faculty time and student interest permit. Recent topics have included "The Economics of Work and Pay," "The Economics of Election Issues," "Women in the Economy," and "Great Ideas in Economics." May be repeated for credit if the topic differs.

### **EC 480 - Internship in Economics (1-3 cr.)**

See "Internships".

### **EC 481 - Internship in Economics (1-3 cr.)**

See "Internships".

### **EC 490 - Seminar: Issues in Contemporary Economics (3 cr.)**

Prerequisite: EC 112 or EC 117 plus six additional credit hours of 200 or 300 level economics.

This course involves discussions of various topics of interest in economics. Each student prepares a research paper on a topic of choice, under the direct supervision of a faculty member. Majors in other programs are most welcome.

Distribution: MR

## **ED - EDUCATION**

### **ED 120 - Introduction to Education (2 cr.)**

Prerequisite: Education Majors or Minors Only, or permission of instructor.

This course is an introduction to educational practices and expectations for students planning to enter the teaching profession. Course content focuses on an introductory overview of lesson planning with a particular focus on the Massachusetts Curriculum Frameworks, teaching diverse student populations, and the Professional Standards for Teachers. Teaching strategies to support learning across disciplines are also explored.

Ten hours of pre-practicum fieldwork and successful completion of fieldwork assignments are required for students intending to complete a Secondary Education Major. Five hours, minimum, for an experiential learning assignment is required for non-majors.

Credit change from 2 crs to 1 cr Fall'15

Credit change from 1 cr to 2 crs Fall'17

### **ED 190 - Special Topics in Education (1-3 cr.)**

Topics in education that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **ED 201 - Principles and Problems of Education (3 cr.)**

Prerequisite: Education Majors or Minors Only, or permission of instructor.

This course is an exploration of the principles and issues associated with our educational system at all levels. Exploration will be completed through study within five broad units: history of public education, teaching and learning theories, education policy, meeting needs of all students, and teaching as a profession. Student performance is assessed through varied assignments, presentations, and active class participation.

Distribution: A&SR/MR

Formerly ED 301

### **ED 202 - Secondary Practicum I (1 cr.)**

Prerequisite: Secondary Education Majors Only, or permission of instructor.

Practicum experiences are designed to provide opportunity for preservice teachers to connect theory to practice, and demonstrate implementation of the Professional Standards for Teachers (PSTs). Students are placed in a local secondary classroom where they work actively with the classroom teacher and students to develop skills in the four PST standards: Curriculum, Planning, and Assessment, Teaching All Students, Family and Community Engagement, and the

Professional Culture standard. In addition to active participation in the secondary classroom, students also complete assignments that are designed to develop pedagogical skills and yield data documenting dispositional qualities, and content knowledge. This data is used for guiding students in building the skills needed to be eligible for, and successful in, the full practicum.

In addition to the PSTs, this prepracticum is focused on gaining experience in content area teaching specific to a student's chosen major, grounded in the matching MA Curriculum Framework.

Distribution: A&SR/MR

### **ED 252 - Survey of Geography (1 cr.)**

Prerequisite: Education Majors or Minors Only, or permission of instructor.

This course introduces students to the diverse field of geography and resources for effectively implementing the MA Curriculum Framework for History and Social Science and National Geography Standards. Content focuses on physical and human geography with an emphasis on the nature and complexity of the human imprint on the Earth's surface. Coursework addresses major topical issues studied by geographers including: landforms, climate, population, culture, cities and government, and overview of the methods geographers use to interpret the world.

Distribution: MR

### **ED 275 - Teaching English Language Learners (3 cr.)**

Prerequisite: Education Majors or Minors Only, or permission of instructor.

This course is designed to support preservice teachers' development of the dispositions, skills and strategies necessary for teaching English Language Learners (ELLs). The broad objectives for the course include: identifying cultural and social issues that impact second language acquisition and school socialization, learning the stages of second language acquisition, recognizing the responsibilities of all classroom teachers for leading ELLs to academic success, practice use of the World Class Instructional Design and Assessment (WIDA) standards, the Massachusetts Curriculum Frameworks, and SIOP strategies to design and implement lessons for ELLs. Through readings and projects students will demonstrate their ability to design instruction that effectively integrates content area learning with language and literacy development for ELLs.

This course must be completed successfully to earn the Sheltered English Instruction (SEI) endorsement; a requirement for K-12 teaching licensure in MA.

Distribution: MR

### **ED 290 - Special Topics in Education (1-3 cr.)**

Topics in education that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **ED 333 - Independent Study in Education (1-3 cr.)**

See "Independent Study".

### **ED 334 - Independent Study in Education (1-3 cr.)**

See "Independent Study".

### **ED 350 - Reading and Language Arts: Theory and Methods (3 cr.)**

Prerequisite: Education majors only, or permission of instructor.

This course focuses on the teaching of children's reading, writing, speaking, listening, and viewing skills in grades 1-6. Students learn formal and informal methods of assessing reading development, and significant theories and practices for developing reading skills and comprehension. They gain knowledge of the principles and instructional practices for developing phonemic awareness and phonics. They learn about the development of listening, speaking, and reading vocabulary, and theories on the relationships between beginning writing and reading. Students also gain an understanding of the approaches and practices for developing skills in using writing tools, as well as theories of first and second language education and development. Lesson planning is introduced in the class; the Massachusetts Framework for English Language Arts and Literacy is used as a reference for lesson rationales. Student performance is assessed by exams, written assignments, and lesson plan designs.

Distribution: MR

This course is a prerequisite.

Formerly "Teaching of Elementary Reading and Language Arts"

### **ED 351 - Elementary Prepracticum I (1 cr.)**

Prerequisite: Elementary Education majors only, or permission of instructor.

Prepracticum experiences are designed to provide opportunity for preservice teachers to connect theory to practice, and demonstrate implementation of the Professional Standards for Teachers (PSTs). Students are placed in a local elementary classroom where they work actively with the classroom teacher and students to develop skills in the four PST standards: Curriculum, Planning, and Assessment, Teaching All Students, Family and Community Engagement, and the Professional Culture standard. In addition to active participation in the elementary classroom, students also complete assignments that are designed to develop pedagogical skills and yield data documenting dispositional qualities, and content knowledge. This data is used for guiding students in building the skills needed to be eligible for, and successful in, the full practicum.

In addition to the PSTs, this prepracticum is focused on gaining experience with literacy teaching and learning, grounded in the ELA MA Curriculum Framework

Distribution: MR

### **ED 361 - Methods for Humanities 5-12 (1 cr.)**

Prerequisite: Education Majors Only, ED 120, or permission of instructor.

The objectives for this methods course focus on developing a repertoire of teaching strategies, and professional resources for

effectively implementing the MA Curriculum Framework for History and Social Science with middle and high school students. Assignments will focus on integrating literacy instruction in content areas drawing from the MA English Language Arts and Literacy Curriculum Framework. Coursework will also emphasize implementation of differentiation, UDL and approaches for meeting the needs of all learners in developing social science and English curricula.

Distribution: MR

### **ED 362 - Methods for Mathematics 5-12 (1 cr.)**

Prerequisite: Education Majors Only, ED 120 or permission of instructor.

The objectives for this methods course focus on developing a repertoire of teaching strategies, and professional resources for effectively implementing the MA Curriculum Framework for Mathematics with middle and high school students. Assignments will focus on integrating literacy instruction in the content area drawing from the MA English Language Arts and Literacy Curriculum Framework. Coursework will also emphasize implementation of differentiation, UDL and approaches for meeting the needs of all learners in developing mathematics curriculum.

Distribution: MR

### **ED 363 - Methods for Sciences 5-12 (1 cr.)**

Prerequisite: Education Majors Only, ED 120 or permission of instructor.

The objectives for this methods course focus on developing a repertoire of teaching strategies, and professional resources for effectively implementing the MA Curriculum Framework for Science, and Technology /Engineering with middle and high school students. Assignments will also focus on integrating literacy instruction in the content area drawing from the MA English Language Arts and Literacy Curriculum Framework. Coursework will also emphasize implementation of differentiation, UDL and approaches for meeting the needs of all learners in developing science curriculum.

Distribution: MR

### **ED 365 - Special Education: Principles & Practices (3 cr.)**

Prerequisite: Education Majors Only and PSY 101, or permission of instructor.

This education course will engage students in the design and modification of curriculum and instructional materials for students with moderate disabilities in general education classrooms (preK-12). Students will learn ways to prepare preK-12 students with moderate disabilities to be successful in general education classroom environments through assessing and monitoring academic and behavioral progress, and learn to make instructional decisions grounded in evidence. Course content will also include definitions and legal aspects pertaining to special education, their role in general education settings, and the work of outside agencies that support students with moderate disabilities. Performance is assessed through assignments, quizzes, presentations, and active class participation.

Distribution: MR

### **ED 366 - Secondary Prepracticum II (1 cr.)**

Prerequisite: Education Majors Only, or permission of instructor.

Prepracticum experiences are designed to provide opportunity for preservice teachers to connect theory to practice, and demonstrate implementation of the Professional Standards for Teachers (PSTs). Students are placed in a local secondary classroom where they work actively with the classroom teacher and students to develop skills in the four PST standards: Curriculum, Planning, and Assessment, Teaching All Students, Family and Community Engagement, and the Professional Culture standard. In addition to active participation in the secondary classroom, students also complete assignments that are designed to develop pedagogical skills and yield data documenting dispositional qualities, and content knowledge. This data is used for guiding students in building the skills needed to be eligible for, and successful in, the full practicum. In addition to the PSTs, this prepracticum is focused on gaining experience in content area teaching specific to a student's chosen major, grounded in the matching MA Curriculum Framework.

This preprac requires design, and formally observed, implementation of a lesson reviewed by WNE content faculty, cooperating teacher, and WNE ED faculty.

Distribution: MR

### **ED 375 - Humanities, Science and Mathematics Methods (3 cr.)**

Prerequisite: Education Majors or Minors only, or permission of instructor.

This methods course focuses on developing a repertoire of teaching strategies and professional resources for effectively implementing the MA Curriculum Framework for History and Social Science, Science and Technology /Engineering, and Mathematics with elementary and middle school students. Coursework includes development of content specific vocabulary, hands on application of concepts and emphasizes implementation of differentiation, UDL and other approaches for meeting the needs of all learners when developing content area curriculum. Students are assessed through written assignments, lesson plans, and other discipline specific assignments.

Distribution: MR

This course is a prerequisite.

Formerly "Elementary Curriculum and Methods"

### **ED 376 - Elementary Prepracticum II (1 cr.)**

Prerequisite: Education Majors only, or permission of instructor.

Prepracticum experiences are designed to provide opportunity for preservice teachers to connect theory to practice, and demonstrate implementation of the Professional Standards for Teachers (PSTs). Students are placed in a local elementary classroom where they work actively with the classroom teacher and students to develop skills in the four PST standards: Curriculum, Planning, and Assessment, Teaching All Students, Family and Community Engagement, and the

Professional Culture standard. In addition to active participation in the elementary classroom, students also complete assignments that are designed to develop pedagogical skills and yield data documenting dispositional qualities, and content knowledge. This data is used for guiding students in building the skills needed to be eligible for, and successful in, the full practicum. In addition to the PSTs, this prepracticum is focused on gaining experience content area teaching in math science and history teaching and learning, grounded in the matching MA Curriculum Frameworks.

This preprac also requires lesson plan development and implementation of monthly arts integrated lessons with Glickman Elementary students, as well as design and implementation of a math station for the Glickman Family night.

Distribution: MR

### **ED 380 - Secondary Education Topics (1 cr.)**

Prerequisite: Secondary Education Majors only, ED 120, and ED 275, or permission of instructor.

This course provides a series of in-service professional development meetings for teacher candidates. Topics addresses include the use of technology in the classroom; legal issues in the classroom; student assessment; collaboration and co-teaching with other educators; and other contemporary topics relevant to becoming an effective educator.

Students gain experience with professional reflection by practicing with topics addressed in the course during the teaching practicum.

Distribution: GUR/MR

The course is now letter graded as of Fall'16.

### **ED 390 - Special Topics in Education (1-3 cr.)**

Topics in education that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **ED 403 - Methods of Teaching in Secondary Schools (3 cr.)**

Prerequisite: Secondary Education Majors only, ED 120, and ED 275, or permission of instructor

This course centers on curriculum planning, instructional methods, student assessment, and classroom management for secondary school teaching. The course begins with concentration on the nature of curriculum and the teaching/learning process; students develop lessons grounded in the most current Massachusetts Curriculum Frameworks. Students apply a variety of instructional techniques, including Universal Design for Learning (UDL), and activities for teaching English Language Learners using the Sheltered Instruction Observation Protocol (SIOP) model. Students demonstrate design of teaching for all learners through microteaching assignments. Students also learn diverse approaches for assessing student learning through diagnostic, formative and summative strategies, and using assessment data to drive instruction decisions. Students examine a number of management tasks faced by teachers, and develop a personalized strategy for classroom management.

Concurrent with this course, students complete their third pre-practicum (25 hours).

Distribution: MR

### **ED 409 - Practicum in Secondary Teaching (9 cr.)**

Prerequisite: Secondary Education Majors only, ED 120, and ED 275, or permission of instructor

This practicum, student teaching, is where students demonstrate evidence they have met the Professional Teaching Standards (PSTs) required for a Secondary Teacher (grades 5-12 or 8-12). Working with a MA licensed teacher and a WNE University faculty member, each student teacher participates in a minimum of four formal observations and three three-way meetings to support development of effective teaching practices, professional behaviors and participation in school culture during this 300 hour (minimum) experience. The Candidate Assessment of Performance (CAP) rubric is a primary outcome tool for identifying level of PST implementation. Sources of evidence of readiness to teach, and eligibility for licensure generated during this full-time teaching experience include: lesson plans grounded in MA Curriculum Frameworks, demonstration of diverse instructional techniques, equitable and safe classroom environment, assessment and work samples of secondary students, development and implementation of curriculum, communication with family and staff as well as products of other targeted assignments. ED 409 must be taken concurrently with ED 410.

This course and SW 412 may not both be counted toward the minimum 120 credit hours required for the degree. Includes 300 hours of full-time practicum fieldwork (student teaching) at a local elementary school.

Distribution: MR

### **ED 410 - Secondary Practicum Seminar (3 cr.)**

Prerequisite: Secondary Education Majors only, ED 120, and ED 275, or permission of instructor

This is a weekly seminar for students completing the secondary teaching practicum (ED 409). As a result of this course, students demonstrate ability to analyze and refine teaching strategies, design curriculum grounded in MA Curriculum Frameworks, classroom management effectiveness, and use of assessment data for making curriculum decisions. Professional issues and preparation for job search are also explored in this course. Students demonstrate above skills and stance as a reflective practitioner, through weekly classroom participation, guided written reflections, and completion of a professional portfolio.

ED 410 must be taken concurrently with ED 409.

Distribution: MR

### **ED 415 - Moderate Disabilities 5-12 Practicum (9 cr.)**

Prerequisite: Education Majors only, or permission of instructor

Distribution: MR

### **ED 416 - Moderate Disabilities Practicum Seminar (5-12) (3 cr.)**

Prerequisite: Education Majors only, or permission of instructor

Distribution: MR



**ED 425 - Infusing Curriculum with Arts, Health, and Technology (3 cr.)**

Prerequisite: Elementary Education Majors only, ED 275, ED 350, ED 365, and ED 375, or permission of instructor

This course focuses on developing a repertoire of teaching strategies and professional resources for effectively integrating the arts, health, physical education, and technology into core subject areas using Massachusetts and National Curriculum Frameworks. Coursework includes hands-on application of concepts, and emphasizes implementation of differentiation, UDL and other approaches for meeting the needs of all learners when developing curriculum. Students are assessed through written assignments, lesson plans, and other content-specific assignments.

Twenty-five hours of pre-practicum fieldwork and fieldwork assignments must be successfully completed at a local school as partial requirement for students intending to complete the Elementary Education Major.

Distribution: MR

This course is a prerequisite.

Formerly "Elementary Education Topics"

**ED 471 - Moderate Disabilities Pre-K-8 Practicum (9 cr.)**

Prerequisite: Education Majors only, or permission of instructor

Distribution: MR

**ED 472 - Moderate Disabilities Practicum Seminar (Pre-K-8) (3 cr.)**

Prerequisite: Education Majors only, or permission of instructor

Distribution: MR

**ED 479 - Elementary Teaching Practicum (9 cr.)**

Prerequisite: Elementary Education Majors only, ED 275, ED 350, ED 365, and ED 375, or permission of instructor

This practicum, student teaching, is where students demonstrate evidence they have met the Professional Teaching Standards (PSTs) required for an Elementary Teacher (grades 1-6). Working with a MA licensed teacher and a WNE University faculty member, each student teacher participates in a minimum of four formal observations and three three-way meetings to support development of effective teaching practices, professional behaviors and participation in school culture during this 300 hour (minimum) experience. The Candidate Assessment of Performance (CAP) rubric is a primary outcome tool for identifying level of PST implementation. Sources of evidence of readiness to teach, and eligibility for licensure generated during this full-time teaching experience include: lesson plans grounded in MA Curriculum Frameworks, demonstration of diverse instructional techniques, equitable and safe classroom environment, assessment and work samples of elementary students, development and implementation of curriculum, communication with family and staff as well as products of other targeted assignments. ED 479 must be taken concurrently with ED 480.

This course and SW 412 may not both be counted toward the minimum 120 credit hours required for the degree. Includes 300 hours of full-time practicum fieldwork (student teaching) at a local elementary school.

Distribution: MR

**ED 480 - Elementary Practicum Seminar (3 cr.)**

Prerequisite: Elementary Education Majors only, ED 275, ED 350, ED 365, and ED 375, or permission of instructor

This is a weekly seminar for students completing the elementary teaching practicum (ED 479). As a result of this course, students demonstrate ability to analyze and refine teaching strategies, design curriculum grounded in MA Curriculum Frameworks, classroom management effectiveness, and use of assessment data for making curriculum decisions. Professional issues and preparation for job search are also explored in this course. Students demonstrate above skills and stance as a reflective practitioner through weekly classroom participation, guided written reflections, and completion of a professional portfolio. ED 480 must be taken concurrently with ED 479.

Distribution: MR

**EE - ELECTRICAL ENGINEERING****EE 205 - Electrical Engineering I (4 cr.)**

Prerequisite: Must complete MATH 134 with a minimum grade of "C". Pre- or corequisite: MATH 236 and PHYS 134.

Cross-Listed as: HONE 205

Students will learn about the static and dynamic behavior of resistors, capacitors, and inductors, the types of electrical energy sources used, the rules used to analyze electrical circuits, to analyze DC and AC circuits for power flow and response characteristics, how to analyze and design op amp circuits used in instrumentation applications, and how to analyze and test Combinational Logic Circuits as applicable to simple industrial and domestic control settings. Students will be able to model and mathematically describe circuit behavior under either static or dynamic conditions. To facilitate learning, this course makes extensive use of a circuit simulator and has a strong laboratory component (with a design project) to reinforce course material and develop laboratory skills with electronic instruments. Three class hours, three lab/tutorial hours.

Distribution: ER/MR

**EE 206 - Electrical Engineering II (4 cr.)**

Prerequisite: EE 205/HONE 205, and pre- or corequisite MATH 236

This course builds on the knowledge gained and analytical skills developed in EE 205. Students learn to analyze circuits in steady state with alternating voltages and currents including determining frequency responses of circuits and analyzing resonant circuits. Students learn to model transformers and include them in steady state analysis of AC circuits. Additionally students study three phase power systems and active filter designs. Students use computer simulation as a tool for both transient and AC steady state analysis and use electrical test equipment to verify the theory learned. The methods of assessing student learning in this course are homework assignments, quizzes, exams, laboratory experiments, with reports a design project and final exam. Three class hours, three lab/tutorial hours.

Distribution: MR

**EE 212 - Fundamentals of Electro-Optics (3 cr.)**

Prerequisite: MATH 236

This course is designed to give the student an introduction to the electrical and optical physics of semiconductor devices. The goals of this course are to provide the student with (1) a working knowledge of semiconductor physics; (2) an understanding of the physical principles behind the most common semiconductor devices: pn-junction, field effect transistor, and bipolar transistor; (3) an understanding of the relationship between the circuit behavior and technological limitation of the scaling devices; (4) an understanding of the move to optical circuitry and its benefits to emerging technology fields such as silicon photonics; (5) explore how nano structures are used to generate, guide, and detect light for applications in communication systems, sensor design, and biomedical devices manufactured using semiconductor foundry techniques. Throughout the semester, the course will utilize the state of the art design software Lumerical to aid in learning and understanding of key concepts. The primary methods of assessing student learning are homework assignments, quizzes, exams and design projects.

Distribution: MR

Formerly "Semiconductor Devices"

Formerly "Physics of Semiconductor Devices"

Formerly EE 312 - cannot receive credit for both EE 312 and EE 212

**EE 285 - Computational Techniques in C (3 cr.)**

Prerequisite: ENGR 105/HONE 105 or equivalent, and MATH 134.

This course provides an introduction to C programming and its application for solving problems in electrical and computer engineering. The application topics include digital signal processing, controls, computational methods, finite difference analysis, root finding, optimization methods, and matrix methods. The course focuses predominantly on applications of the methods, and students are required to solve real world, engineering problem utilizing the C language as well as MATLAB to implement algorithms. Students will gain practical experience with these techniques dealing with real applications.

**EE 301 - Signals and Systems (3 cr.)**

Prerequisite: MATH 236 and pre- or corequisite EE 206.

This is the first of a sequence of two courses that is developed to introduce students to the concepts of signal modeling and the interaction of signals and linear systems. The focus is on the continuous-time cases such as voice and music. Students learn signal and system modeling concepts; time-domain analysis including concepts of convolution and superposition; system response to different stimuli including impulse and step; frequency-domain analysis including concepts of Fourier series, Fourier transforms, and Laplace transforms; and applications of analytical tools such as signal representations, transfer functions, and filtering. Throughout the semester, MATLAB, a computational software program, is used to emphasize and to help in understanding important concepts of the course as well as a tool for solving homework problems. The methods of assessing student learning in this course are homework assignments, quizzes, in class exams, and a final exam.

Distribution: MR

Formerly "Signals and Systems I"

**EE 302 - Introduction to Digital Signal Processing (3 cr.)**

Prerequisite: EE 301.

This is essentially the continuation of EE 301 (Signals & Systems), which deals with continuous time signals and systems. In EE 302 (Introduction to Digital Signal Processing (DSP)) students develop the ability to apply mathematical techniques to analyze discrete time signals and systems. Students learn the fundamentals of sampling and the representation of discrete-time systems and signals, the z-transform, inverse z-transformation, discrete convolution, difference equations, discrete-time transfer functions, discrete Fourier transform (DFT), and its realization through the use of fast Fourier transform (FFT) algorithms. Students also learn to analyze discrete-time systems and design digital filters - Infinite Impulse Response (IIR), and Finite duration Impulse Response (FIR) digital filters. Additionally, students are also introduced to the random nature of signals. Throughout the semester, MATLAB, a computational software program, will be used to help in understanding important DSP concepts and for solving homework problems.

Distribution: MR

Formerly "Signals &amp; Systems II"

**EE 303 - Electronic Circuits (3 cr.)**

Prerequisite: EE 206 or equivalent.

Corequisite: EE 319

Co-requisite: EE 301 or equivalent, or permission of instructor.

This course is designed to introduce the behavior and modeling of nonlinear circuits and elements including operational amplifiers, diodes, bipolar junction transistors, and field-effect transistors. Students will learn the different methodologies to analyze circuits containing these components as well as design basic circuit building blocks in both analog and digital circuits. Computer aided simulation tools such as LTSpice will be used to reinforce key concepts. The primary methods of assessing student learning will be homework assignments, quizzes, exams, and design projects.

Distribution: MR

Formerly "Introduction to Microelectronic Circuits I"

**EE 314 - Electromagnetic Fields and Waves (3 cr.)**

Prerequisite: EE 206 or equivalent.

This is a one-semester introductory course in engineering electromagnetics. Emphasis is placed on time varying topics, such as transmission lines, Maxwell's equations, plane wave propagation, rectangular waveguides, and antennas. The basic concepts of electromagnetic fields, including field vectors, potentials, energy, boundary conditions and material effects will be discussed. Modern RF & microwave CAD such as Advanced Design System (ADS) or ANSYS DesignerRF will be used to design microstrip impedance matching networks. The primary methods of assessing student learning are homework assignments, exams, and a design project.

Distribution: MR

Formerly "Fields and Waves"

**EE 319 - Electrical Engineering Laboratory I (2 cr.)**

Corequisite: EE 303 concurrently

This course is the first of the three course sequence designed to give students hands-on experience in the use of laboratory instruments,

collection and interpretation of data, and design and debugging of electrical analog and digital circuits. The course also serves to develop technical writing skills. Students investigate device characteristics according to the instructions given and compare with those expected from theory. They also design and build digital and analog electronic circuits and demonstrate by appropriate measurements that the circuits perform and meet the design specifications. Students prepare engineering reports for every laboratory experiment. The assessment is based on the quality of collected data and the written report.

Distribution: MR

One class hour, one three-hour lab.

### **EE 320 - Analog Integrated Circuits (3 cr.)**

Prerequisite: EE 303 or equivalent.

This course is designed to study the building blocks of analog integrated circuits utilizing both BJT and CMOS implementations. Students will learn to analyze and design basic reference circuits, current mirrors, gain cells, multistage amplifiers, differential amplifiers, and feedback amplifiers. Feedback and frequency analysis of amplifiers is emphasized. Students will utilize Cadence Electronic Design Automation tools to aid in the design and implementation of integrated circuit architectures. The primary methods of assessing student learning include homework, exams, and design projects.

Distribution: MR

Formerly "Introduction to Microelectronic Circuits II"

### **EE 322 - Electrical Engineering Laboratory II (2 cr.)**

Corequisite: EE 319 and EE 320 concurrently.

Required of all Electrical Engineering majors (electrical and computer concentrations). The course builds on the skills developed in EE 319 and the material learned in junior level courses. Students design, build, and test electronic circuits. Students also study the societal impact of electrical engineering, and contemporary issues related to electrical engineering. The assessment in this course is based on the quality of work done in the lab and the quality of the students' reports.

Distribution: MR

One class hour, and one three-hour lab.

### **EE 333 - Independent Study in Electrical Engineering (3 cr.)**

See "Independent Study".

Distribution: MR

### **EE 336 - Electrical Energy Systems (3 cr.)**

Prerequisite: EE 205 /HONE 205

This is an introductory level course in the generation, distribution, and management of electrical energy in the context of Green Engineering. This course presents the essential components and operating features of the power industry so that those components and features can be used effectively with emerging technologies of energy capture (i.e. solar, wind, geothermal, etc.). Upon successful completion of this course, students should have a firm understanding of the structure and components of an electrical power system and be able to model such systems and determine associated power flows, efficiencies, and energy budgets. Methods of assessment include homework, quizzes, tests, and a short paper on one of the topics related to the course.

Distribution: MR

### **EE 338 - Electric Drives (3 cr.)**

Prerequisite: EE 205/HONE 205

This is an introductory level course in electric drive systems. Advances in power electronics has permitted the development of adjustable-speed drives which provide significant performance and efficiency improvements in such areas as pumps and compressors, precision motion control in automated factories, wind-electric systems in generating electricity, and hybrid-electric vehicles, to name a few. To understand what a variable-speed drive is and how it works we will study such things as mechanical models related to rotating machines, review of associated electric circuits' theory, overview of electric converter operation, electro-mechanical energy conversion principles, and what needs to be considered in controlling the various types of electrical machines available to us. Successful completion of this course should provide the student with a strong background at the systems integration level of electric drives. Methods of assessment include homework, quizzes, and tests.

Distribution: MR

### **EE 411 - Random Signals and Noise (3 cr.)**

Prerequisite: EE 301 or IE 212.

This is a study of signals, both random and nonrandom. Topics include spectrum analysis, auto-correlation and cross-correlation functions, network analysis of systems with random signals and noise, applications to various areas such as: reception of radar, and space signals. A design project is required.

### **EE 414 - Microwave Engineering (3 cr.)**

Prerequisite: EE 314 or equivalent.

Cross-Listed as: EE 514

Fundamentals of modern microwave engineering with emphasis on microwave network analysis and circuit design. Microwave transmission lines, including waveguide, coax, microstrip, and stripline. Microwave circuit theory, including S-parameters, ABCD matrices, equivalent circuits, and signal flow graphs. Upon completion of this class the student will be able to analyze and design passive microwave circuits and components such as matching networks and microwave resonators, power dividers, directional couplers, and filters. Modern RF & microwave CAD such as ANSYS HFSS, ANSYS DesignerRF, Advanced Design System (ADS), and MATLAB will be used to emphasize and to help in understanding important concepts of the course. The primary methods of assessing student learning are homework assignments, exams and design projects.

**EE 416 - Electromagnetic Compatibility (3 cr.)**

Prerequisite: EE 301 and EE 314 or the equivalents.

Senior level course focusing on the application of electromagnetic field and wave principles to equipment and system design practices for the control of Electromagnetic Interference (EMI) and the achievement of Electromagnetic Compatibility (EMC). EMI requirements for electronic equipment, EMI measurements, non-ideal behavior of components, spectrum analysis, radiated emissions and susceptibility, conducted emissions, crosstalk, field-to-cable and cable-to-field coupling, electrostatic discharge, grounding, and system configuration. The primary methods of assessing student learning are homework assignments, quizzes, exams, and design projects.

**EE 421 - Electronics of Radio (3 cr.)**

Prerequisite: EE 303.

Design of a radio system for transmission of information; types of receivers, matching techniques, oscillators, design using 2-port network parameters, receiver and antenna noise, nonlinear effects, frequency synthesis. The goal of this course is to teach electrical engineering students the basic principles of radio-frequency circuit design and to illustrate how such circuits are used in communication systems. The primary methods of assessing student learning are homework assignments, quizzes, exams, and design projects.

**EE 422 - Control Systems (3 cr.)**

Prerequisite: EE 301 or ME 320 or BME 202.

This is an introductory course in analysis and design of linear control systems. Students learn to analyze mathematical models, systems representation and reduction, steady-state errors, time domain and frequency domain system performance and specifications, methods of testing for stability, Bode, root locus, and frequency domain response methods of linear time invariant systems. They also learn to design lead, lag, and lead-lag compensation techniques. Students also learn to use MATLAB computational software to understand new concepts and to perform and implement system analysis and design techniques. The methods of assessing student learning in the course are quizzes, exams, homework assignments, and a project.

Distribution: MR

**EE 423 - Communications (3 cr.)**

Prerequisite: EE 302 and EE 320 This is a course in electronic (analog and digital) communication fundamentals.

Cross-Listed as: EE 523

After successfully completing this course students know what analog and digital signaling methods (PAM, PCM, AM, PM, and FM) are available; know how to model, analyze, and design a basic communication link; know how to model, analyze, and design signals that go with the various signaling methods (including the theories on information measure, signal types and their measure, encoding schemes and Fourier analysis); are familiar with the various types of modulation and demodulation schemes available and are familiar with some of the practical applications of modulation/demodulation theory. The methods of assessing student learning in this course are homework assignments, quizzes, classroom discussions, a research project, and a final exam.

Distribution: MR

**EE 425 - Linear Systems Theory (3 cr.)**

Prerequisite: EE 301 or concurrently

Cross-Listed as: EE 525

Students learn the fundamentals of the state space approach to systems modeling, analysis, and design. They also learn how to find the state space model of electrical, mechanical, and electromechanical systems. In addition students learn how to represent a system in the Jordan, first canonical, and phase variable forms, and to apply state space techniques to find zero input, zero state, and complete solution from state space system equations. In addition students learn to perform system stability, controllability, and observability tests and to design state and output feedback techniques as well as observer design technique. Students also learn to use MATLAB computational software to understand new concepts and to perform and implement system analysis and design techniques. The methods of assessment of student learning in this course are homework assignments, quizzes, tests, and a design project.

**EE 427 - Electrical Engineering Laboratory III (2 cr.)**

Prerequisite: EE 322

This is the third of a three-course laboratory sequence. The course consists of several experimental projects designed to provide students with hands-on experience in analysis and design of electronic circuits and systems. After successfully completing this course the students are able to design, construct, and test sensor, relay, and motor interface circuits. They will design these circuits as part of an interdisciplinary project where the team designs, constructs, and tests a vehicle. They will build a prototype circuit board and interface it to the sensors, relay circuit, motor, and power source on the vehicle and to the microprocessor prototype circuit board. Additional experiments in control theory will be performed. These experiments include modeling and simulation of a control system, and designing, building, and testing an analog PID motor speed controller. The students reinforce their technical writing ability by writing an engineering report on the results of each project. The assessment in this course is based on the quality of the work done in the laboratory and the written reports.

Distribution: MR

One class hour, one three-hour lab.

**EE 428 - Design of Analog CMOS Integrated Circuits (3 cr.)**

Prerequisite: EE 320 or equivalent.

The general objective of the course is to introduce students to the building blocks of analog integrated circuits; such as differential amplifiers, current sources and mirrors, gain stages, level shifters, active loads, and output stages. Throughout the semester, Spice will be used to emphasize and to help in understanding important concepts of the course as well as a tool for solving homework problems. The primary methods of assessing student learning are homework assignments, quizzes, exams, and a term project.

**EE 430 - Nanoelectronics (3 cr.)**

Prerequisite: EE 303

This course is a sequence in the study of microelectronic circuits by introducing students to the electrical properties of nanoscale CMOS transistors including both planar and FinFet MOSFETs as well as introduce students to the physical design of such technologies. The goals of this course are to provide the student with (1) a working knowledge of short channel effects in nanoscale transistors; (2) an understanding of the non-linear models used to capture quantum effects in transistors; (3) a perspective in electronic design automation (EDA) principles for the physical design of complex

integrated circuits consisting of billions of nanoscale transistors; (4) an exposure to semiconductor foundry process design kits (PDKs) that aid and govern circuit designers in creating physical integrated circuit designs. Throughout the semester, the course will utilize the state of the art electronic design automation software Cadence to aid in learning and understanding of key concepts. The primary methods of assessing student learning are homework assignments, quizzes, exams and design projects.

Formerly "VLSI Design"

### **EE 431 - Semiconductor Device Modeling for VLSI (3 cr.)**

Prerequisite: EE 312 or equivalent.

This course will describe the operation and characteristics of high speed devices: submicron silicon MOSFETS and Silicon Bipolar Transistors for high frequency and VLSI applications. It will also cover the basics of MESFETS and some high speed devices using compound semiconductors (HEMTs and HBTs).

### **EE 432 - Wireless Communication Techniques (3 cr.)**

Prerequisite: EE 423

This course begins with an introduction to wireless communication fundamental concepts and recent innovations. It deals with topics such as wireless channels, the cellular system, modulation techniques for mobile communication, multiple access technologies, multi-carrier transmission technologies, all the way to advanced modern wireless communication technology, such as software defined radio and cognitive radio. After successfully completing the course, students can simulate digital wireless communication systems using MATLAB; most importantly, students can build, implement and demonstrate software defined radio based wireless communication system using certain hardware. The methods of assessing student learning in this course are homework assignments, project assignments, classroom discussions, and exams.

### **EE 434 - Electrical Energy Converters/Inverters (3 cr.)**

Prerequisite: EE 206 and EE 303.

Electrical converters are an important component in portable electronics (especially digital electronics) where there is a need to efficiently convert standard battery voltages to other DC levels. The converter can be considered a DC to DC transformer. The inverter is an important component in electrical energy storage and management. The inverter takes the DC from such things as storage batteries and converts it to AC for distribution on a power network or to control electrical motors. Both devices play a major role in the management and distribution of renewable energy. This introductory course presents the foundation theory for analyzing and designing DC-DC converters (both buck and boost) as well as DC-AC inverters. Students will learn the various modeling schemes for switched electronic circuits starting with the idealized basics through to 'real world' practical complications. The course will also deal with how these devices have to be controlled to automatically compensate for changes in input energy and output loading (line and load regulation). To facilitate learning concepts and modeling various circuit topologies this course will make use of circuit simulation and mathematics software packages. Methods of assessing student learning include homework, quizzes, tests, and a short paper on some aspect of the material being studied.

### **EE 435 - Fuzzy Logic (3 cr.)**

Prerequisite: Junior or Senior standing.

This course covers the fundamentals of fuzzy logic theory and its applications. Students learn to analyze crisp and fuzzy sets, fuzzy propositional calculus, predicate logic, fuzzy logic, fuzzy rule-based expert systems, and apply fuzzy logic theory to a variety of practical applications. Students also learn to use MATLAB computational software to understand new concepts and to perform and implement fuzzy logic rules and systems. The methods of assessing student learning in this course are homework assignments, quizzes, classroom discussions, design projects, and a final exam.

### **EE 436 - Project Research, Innovation and Development (2 cr.)**

Prerequisite: Senior standing.

This course is designed to enable students to select and get started on the year-long senior project. Students are guided in formulating a proposal for a Senior Design Project in preparation for project completion in EE 440. Faculty and representatives from industry present ideas for Senior Design Projects and each student chooses a project, and develops and writes a project proposal with the supervision and guidance of a faculty advisor. In the process of completing this course, students learn about the product development process - they learn about researching the problem being addressed, how to innovate and develop products. Students will also learn about needs analysis, identifying business opportunities and assessing market potential. The assessment in this course is based primarily on measurements related to making progress towards project completion. This includes maintaining a log book, submitting brief reports and making a presentation at the end of the semester that documents the project status. Additionally, short papers on some of the issues discussed in presentations will also be graded and counted to the final grade.

### **EE 437 - Design Projects (3 cr.)**

Corequisite: EE 439 and approval of the department.

Selected students work on an independent design project in the semester prior to enrolling in EE 440. This course is intended to provide students with the opportunity for a two-semester project sequence culminating with EE 440.

### **EE 439 - Professional Awareness (1 cr.)**

Prerequisite: Senior standing.

This course is designed to make students aware of some of the problems, concerns, and responsibilities of an engineer as a professional. In addition, students are guided in formulating a proposal for a Senior Design Project in preparation for project work in EE 440. Students participate in discussions, led by invited speakers, on topics that enable students to write a professional résumé, interview for a job, generate an effective and substantive report, and make an effective technical oral presentation. Students are exposed to ethical issues in engineering environments, made aware of the necessity of protecting their work with either patents, copyrights, trademarks, and trade secrets and of not infringing on the similar rights of others; and apprised of issues of safety in the work place, product liability, and the importance of professional registration. Faculty and representatives from industry present ideas for Senior Design Projects and each student chooses a project, and develops and writes a project proposal with the supervision and guidance of a faculty advisor. The assessment in this course is based on students' participation in discussions, the submission of short papers on some of the issues raised in the presentations, and the quality of project proposal and the oral presentation. One class hour.

Distribution: MR

**EE 440 - Senior Design Projects (3 cr.)**

Prerequisite: EE 439, EE 436

This is a capstone design course that prepares students for entry-level positions. In this course each student works on an independent engineering project under the supervision of a faculty advisor. Students apply the design process and communicate the results of their project work in both oral and written form. Oral reports are presented before an assembly of faculty and students. Students apply engineering design principles either by working on a product, improving a product, or designing experiments to investigate causes of either an observed phenomenon or a problem in engineering. Students are required to demonstrate their achievements using appropriate laboratory exhibits. Students who select industry-sponsored projects have the opportunity of working with the industrial advisor in an actual engineering environment. The assessment in this course is based on the student's level of commitment demonstrated throughout the semester, the level of achievement attained, the recording of activities in a log book, and the quality of the written report and oral presentation. Meeting hours by arrangement.

Distribution: MR

**EE 445 - Neural Networks - Deep Learning (3 cr.)**

Prerequisite: MATH 236 or concurrently.

Cross-Listed as: EE 545

This is a study of the basic concepts of neural networks and its application in engineering. In this course students learn the single layer and multilayer neural network architectures; understand linear and nonlinear activation functions; and analyze and implement McCulloch-Pitts, Hebbian, Hopfield, Perceptron, Widrow-Hoff, ADALINE, delta, and back propagation learning techniques with ample practical applications. Students also learn to use MATLAB computational software to understand new concepts and to perform and implement neural network rules and paradigms. The methods of assessing student learning in this course are homework assignments, quizzes, classroom discussions, design projects, and a final exam.

Formerly "Neural Networks"

**EE 448 - Integrated Photonics (3 cr.)**

Prerequisite: EE 314 or equivalent.

Corequisite: or concurrent EE 312

This course is designed to introduce electrical engineering students to the emerging field of integrated photonics. Maxwell's equations at optical frequencies are the foundation for photonic integrated circuit design. This course will specifically explore how nano structures are used to generate, guide, and detect light for applications in communication systems, sensor design, and biomedical devices manufactured using semiconductor foundry techniques. Throughout the semester the course will utilize the state-of-the-art photonics integrated circuit design software Lumerical to aid in learning and understanding of key concepts. Students will also use the equipment in the LEAP@WNE laboratory to measure and characterize silicon photonic circuits. Upon completion of the course, students will be proficient in photonic integrated circuits from theory to practical design and implementation. The primary methods of assessing student learning are homework assignments, quizzes, exams and design projects.

formerly Introduction to Electro-Optics

formerly Silicon Photonics

**EE 449 - Optical Engineering (3 cr.)**

Prerequisite: MATH 235

Cross-Listed as: EE 549

This course introduces fundamental principles of classical and modern optics as well as key principles in optical design used in the engineering of optical systems. The course offers students an exposure to practical aspects of optical materials and devices. Key topics discussed include the propagation of light, lenses/aberrations, diffraction, interference, holography, and fiber optics. Active optical components are also discussed including light modulators, photodetectors, and LASERS. Students will also use the equipment in the LEAP@WNE laboratory to measure and characterize optical systems to reinforce key concepts in the course. Key assessment techniques will include homework assignments, exams, and design projects. Project based learning will be a key component of the course and student outcomes.

**EE 450 - Power Electronics (3 cr.)**

Prerequisite: EE 303 or equivalent.

This is a course in the components and systems used in power electronics. After successfully completing this course students will be familiar with the types and uses of electronic power components as well as understanding and using the various analytical methods (including state space and piecewise linear) that model components and systems that manage, control, and convert electrical energy. Topics include (but are not limited to) semiconductor power devices (such as diodes, SCRs, power FETs, etc.), energy conversion methods (such as ac-dc, dc-dc, dc-ac, etc.), converter electronics (such as buck, boost, etc.), conversion efficiency, and output regulation. The methods of assessing student learning in this course are homework assignments, quizzes, classroom discussion, a research project, and a final exam.

**EE 455 - RF and Microwave Wireless Systems (3 cr.)**

Prerequisite: EE 314 or equivalent.

Cross-Listed as: EE 555

This course provides an introduction to various RF and microwave system parameters, architectures and applications; theory, implementation, and design of RF and microwave systems for communications, radar, sensor, surveillance, navigation, medical, and optical applications. The primary methods of assessing student learning are homework assignments, quizzes, exams, and design projects.

**EE 456 - RF and Microwave Active Circuit Design (3 cr.)**

Prerequisite: EE 314 or equivalent.

Cross-Listed as: EE 556

The general objective of the course is to introduce students to the principles, processes and techniques used in the design and realization of modern microwave and wireless active circuits. The emphasis of the course is on the design of narrow band, broadband and low noise amplifiers employing three terminal devices such as HEMETs and HBTs. Detailed study of noise figure, noise parameters and stability of RF and microwave circuits using S-parameters. Modern RF & microwave CAD such as Advanced Design System (ADS), ANSYS DesignerRF, and MATLAB will be used to emphasize and to help in understanding important concepts of the course. The primary methods of assessing student learning are homework assignments, quizzes, exams, and design projects.

**EE 457 - Wave Transmission and Reception (3 cr.)**

Prerequisite: EE 314.

Cross-Listed as: EE 557

This course is designed to provide seniors/first year graduate students in electrical engineering with a solid foundation in applied electromagnetics. A review of transmission lines and the design of impedance-matching techniques will be explored. The application of Maxwell's equations to guided waves and radiation will also be explored. The rectangular waveguide is studied. Following this an introduction to basic antenna theory is given. Basic properties of transmitting and receiving antennas and antenna arrays will be introduced. Applications in such diverse fields as wireless communication systems, Radar and microwave imaging will be emphasized. Modern RF & microwave CAD such as ANSYS HFSS, ANSYS DesignerRF, and MATLAB will be used to emphasize and to help in understanding important concepts of the course as well as a tool for solving homework problems. The primary methods of assessing student learning are homework assignments, exams, and design projects.

**EE 467 - Solid-state Electronic Devices (3 cr.)**

Prerequisite: EE 312.

Cross-Listed as: EE 567

The electrical behavior of solids, or the transport of charge through a metal or semiconductor, is determined by the properties of the electrons and the arrangement of atoms in the solid. Through a study of the crystal structure of electronic materials and the fundamentals of quantum electronics, students understand the band theory of solids, particle statistics, transport phenomena, and conductivity. Further study of equilibrium distributions in semiconductor carriers and p-n junctions leads to an understanding of solid state device operation. The investigation of practical devices such as diodes, IMPATT diodes, bipolar and junction field-effect transistors, and MOS devices enhance students' knowledge of the design and analysis techniques used in real-world applications. A design project is required. Upon completion of this course students should be proficient in the use of solid-state component and system design techniques and are familiar with a wide variety of semiconductor device applications. The methods of assessing student learning in this course are homework assignments, quizzes, classroom discussions, design projects, and a final exam.

**EE 470 - Computer-Controlled Systems (3 cr.)**

Prerequisite: EE 302 or concurrently, and MATH 236.

Cross-Listed as: EE 570

Students learn the fundamentals of the state space approach to discrete systems modeling, analysis, and design. They also learn to find the discrete state space model of mechanical, electrical, and electromechanical systems, and learn how to solve zero input, zero state, and complete responses of a system represented in discrete state space form. In addition students learn to analyze stability, controllability, and observability of sampled data system and to design computer controlled feedback systems to improve performance of a discrete time systems as well as learning to design observers. Students also learn to use MATLAB computational software to understand new concepts and to perform and implement discrete system analysis and design techniques.

**EE 480 - Internship in Electrical Engineering (3 cr.)**

See "Internships".

**EE 482 - Electrical Engineering Research (1-3 cr.)**

Prerequisite: Junior and Senior Standing

See "Undergraduate Research" in catalogue.

Variable credits 1-3 cr.

**EE 485 - Signal Processing (3 cr.)**

Prerequisite: EE 302 and MATH 236.

This is an introductory course in digital signal processing. It provides the requisite background for an entry-level position in signal processing or for advanced study. After successfully completing this course, students are familiar with the basic theory and practice of digital signal processing. The course covers the theory of digital signal processing with emphasis on the frequency domain description of digital filtering: discrete Fourier transforms, flowgraph and matrix representation of digital filters, digital filter design, fast Fourier transform, and effects of finite register length. Classroom lectures are supplemented with implementation exercises using MATLAB and the DSP Hardware.

**EE 490 - Special Topics in Electrical Engineering (3 cr.)**

This is a study of an advanced topic in engineering of special interest to electrical engineering majors, but not offered on a regular basis.

**ENGL - ENGLISH****ENGL 130 - English Composition IA (3 cr.)**

Prerequisite: Permission of the instructor.

This course is designed for students needing preparatory work in key elements of college-level writing and reading. Topics include sentence and paragraph development, fundamentals of grammar, the writing of expository essays, integration of sources, and strategies for the critical reading of prose non-fiction. Note: Students placed in ENGL 130 may have to take additional credits to fulfill graduation requirements in some programs. Students who need supplemental instruction in grammar, mechanics, and usage take, on recommendation, a concurrent lab in writing fundamentals, LA 150 or LA 151

Formerly "English Composition IA: College Reading and Writing A"

Laboratory fees \$50.

**ENGL 132 - English Composition I (3 cr.)**

Prerequisite: A minimum grade of "C-" or better in ENGL 130, or successful performance on WNEU English placement exam

This is a standard course in the techniques of critical reading and academic writing. The purposes of the course are to develop skill in reading prose nonfiction from a variety of disciplines, to develop skill in writing accurate and effective informative prose on a variety of subjects, using a variety of techniques, to develop sensitivity to language and writing, to understand conventions of citation and documentation, and to develop critical judgment of one's own writing and that of others. Particular attention is given to the importance of thesis, evidence, audience, and thoughtful revision. Students who need supplemental instruction in grammar, mechanics, and usage take, on recommendation, a concurrent lab in writing fundamentals, LA 150.

Distribution: CR/ER/GUR/MR

This course is a prerequisite.

Formerly "English Composition I: College Reading and Writing"

Laboratory fees \$50.

### **ENGL 133 - English Composition II (3 cr.)**

Prerequisite: A minimum grade of "C-" or better in ENGL 131, ENGL 132, or ENGL 140-level, or the equivalent.

This course explores the many ways in which human experience is shaped by language and culture. Focused on a semester-long theme, English 133 emphasizes both close reading and expository writing as students hone critical thinking skills. This course stresses the analytic reading of literary texts in a cultural context and the writing of accurate, effective, and persuasive prose using evidence from primary and secondary sources. English 133 courses consider literature and other cultural texts from underrepresented populations and/or discuss a wide range of cultural issues including those of racial and ethnic diversity and gender politics.

Distribution: CR/ER/GUR/MR

This course is a prerequisite.

Formerly "English Composition II: Introduction to Literature"

Laboratory fees \$50.

### **ENGL 139 - Writing for Special Purposes (1 cr.)**

Prerequisite: A maximum grade of "C-" in ENGL 132 or ENGL 133.

Building on the work taught in ENGL 132 or ENGL 133, students work under the guidance of a professor to communicate a central idea and organize a substantial amount of supporting material in a format different than those stressed in the introductory courses.

May be taken more than once.

Laboratory fees \$50.

### **ENGL 206 - Writing for Business (3 cr.)**

Prerequisite: A grade of "C-" or better in ENGL 133, or permission of English chair

This course is designed to give students a comprehensive view of communication, its impact and importance in business, and the role of written communication in establishing a favorable outside environment, as well as effective internal communications skills. The various types of business communication are covered. This course also develops an awareness of the importance of succinct and clear written communication in the modern business world.

This course satisfies the A & S Writing Intensive Course requirement for A & S students.

### **ENGL 214 - World Literature I (3 cr.)**

Prerequisite: Sophomore standing and "C-" or better in ENGL 133, or permission of English chair

Students read selections from the time of Homer to the nineteenth century.

Distribution: MR

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 215 - World Literature II (3 cr.)**

Prerequisite: Sophomore standing and "C-" or better in ENGL 133, or permission of English chair

Students read selections from significant writers of the last 200 years.

Distribution: MR

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 223 - African American Literature I (3 cr.)**

Prerequisite: Sophomore standing and "C-" or better in ENGL 133, or permission of English chair.

An introduction to African American literature from colonial times to 1865, covering poetry, fiction, drama, and nonfiction prose such as slave narratives, memoirs, sermons, and speeches. The cultural context of the literary period will be explored. The course will cover such authors as Wheatley, Truth, Douglass, Turner, and others.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 224 - African American Literature II (3 cr.)**

Prerequisite: Sophomore standing and "C-" or better in ENGL 133, or permission of English chair.

An introduction to African American literature from the era of Reconstruction to the present, covering poetry, fiction, drama, and nonfiction prose such as memoirs, sermons, and speeches. The cultural context of literary periods will be explored. The course will cover such authors as Washington, DuBois, Hughes, Cullen, Brooks, Hurston, Ellison, Wright, Angelou, Baldwin, Morrison, Malcolm X, and Martin Luther King Jr.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

Formerly ENGL 318.

### **ENGL 231 - British Literature I (3 cr.)**

Prerequisite: Sophomore standing and "C-" or better in ENGL 133, or permission of English chair.

This is a critical survey of selected texts in British literature from its origins to 1780. Emphasis is on major traditions and on major writers such as Chaucer, Marlowe, Donne, Jonson, Milton, Dryden, Swift, and Johnson.

Distribution: MR

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 232 - British Literature II (3 cr.)**

Prerequisite: Sophomore standing and "C-" or better in ENGL 133, or permission of English chair.

This is a critical survey of selected texts in British literature from the Romantic period to 1945. Emphasis is on major traditions and on major authors such as Wordsworth, Coleridge, Byron, Keats, Shelley, Austen, Tennyson, Browning, Arnold, Dickens, Conrad, Lawrence, Shaw, and Yeats.

Distribution: MR



This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 237 - Creative Writing (3 cr.)**

Prerequisite: Sophomore standing and "C-" or better in ENGL 133, or permission of English chair.

This is a course designed for students who wish to write "creatively." Emphasis is on writing poetry and short fiction. Students will develop and refine their writing skills and start to develop a writing portfolio.

Open to all majors.

Distribution: MR

This course satisfies one of the Writing Intensive course requirements for Arts and Sciences students.

### **ENGL 240 - Editing (3 cr.)**

Prerequisite: Sophomore standing and "C-" or better in ENGL 133, or permission of English chair.

This course will train writers in editing their own texts for good grammar, punctuation, organization, length and tone, in a variety of media. In addition, they will develop their ability to recognize and correct errors in others' writing, as well as revise those texts for the requirements of whatever publication may be involved. The goal of editing is to ensure that the end result is the best it can be before it goes public, with quality of content and delivery meeting high technical and ethical standards.

### **ENGL 249 - Tutoring Practicum: Writing and Grammar (3 cr.)**

Prerequisite: Sophomore standing and "C-" or better in ENGL 133, or permission of English chair.

With a focus on presenting tutoring as formalized academic support, this course is designed to develop interpersonal teaching, communication skills, and English grammar knowledge essential for writing tutors as well as for students preparing for a career in secondary education. Students will study and analyze current writing theories, various writing genres, revision strategies, documentation style systems, and a variety of tutoring and teaching methods. The course will also address the history and structure of the English language and focus on the rules and conventions of standard written and spoken English including concepts such as form, meaning, knowledge, and usage of English grammar structures at the advanced level.

Formerly "Tutoring Seminar"

This course satisfies one of the Writing Intensive course requirements for Arts and Sciences students.

### **ENGL 251 - American Literature I (3 cr.)**

Prerequisite: Sophomore standing and "C-" or better in ENGL 133, or permission of English chair.

This course is an advanced creative writing course that places an emphasis on the craft of fiction. In this class, students will discuss works by contemporary writers, write and revise their own fiction, and respond to their peers' drafts.

Distribution: MR

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

This course can be repeated for credit with Chair's permission.

### **ENGL 252 - American Literature II (3 cr.)**

Prerequisite: Sophomore standing and "C-" or better in ENGL 133, or permission of English chair.

This is a study of American literature 1860- the present.

Distribution: MR

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 260 - Literary Horizons (3 cr.)**

Prerequisite: "C-" or better in ENGL 133, or permission of English chair.

Required in Elementary Education program. This course is an introduction to the learning standards in the literature strand of the Massachusetts Curriculum Frameworks and to the application of those standards to literary works. It will present potential elementary teachers with the background information necessary to apply the standards to works from our "Common Literary Heritage," as suggested by the Massachusetts Department of Education.

Distribution: MR

This course satisfies one of the Writing Intensive course requirements for Arts and Sciences students.

### **ENGL 270 - Writing for the Web (3 cr.)**

Prerequisite: "C-" or better in ENGL 133, or permission of English chair.

This course will provide students with skills to build content on websites, blogs, and social media. We'll begin by performing rhetorical analyses of various posts and websites to examine how one determines one's purpose, audience, focus, development, and organization for a particular post on a specific site. At first, in addition to these analyses, homework will involve posting on our class blog (using Wordpress' "edublog" format) and creating posts such as "how-to" processes, trailers for books, or other types of posts that involve both written and visual components. By the end of the course, everyone will have developed their own website based on their interests; for example, one could create a go-to site for film reviews of superhero movies, or create a blog that describes what it's like to be a student with ADD, present information and experience about choosing a vegan lifestyle, or a curate a site devoted to fan fiction. There are so many possibilities for students to develop both

their own skills at writing and basic design and to learn how to create content about the issues that concern them.

Distribution: MR

This course satisfies one of the Writing Intensive course requirements for Arts and Sciences students.

### **ENGL 281 - Drama of the English Renaissance (3 cr.)**

Prerequisite: "C-" or better in ENGL 133, or permission of English chair.

This course introduces students to the richness and variety of English Renaissance drama beyond the plays of Shakespeare.

Class meetings will include lecture, discussion, student performances, and the analysis and interpretation of scenes viewed on video.

Distribution: MR

This course satisfies one of the Writing Intensive course requirements for Arts and Sciences students.

Formerly "Supermen, Buffoons, & Bloody Revenge: Drama of the English"

### **ENGL 290-299 - Special Topics in English (1-3 cr.)**

Topics in English that are not offered on a regular basis are examined.

The course may be repeated for credit if the topic varies.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 302 - Approaches to the Study of Literature (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133 and one literary survey, or permission of English Chair.

This course will explore contemporary literacy and cultural studies. Students will read primary texts that have had a major influence on the interpretation of literature (Freud, Marx, and others), explore the development of major critical "schools" of thought, and learn to consider texts from a variety of perspectives. This course will have students study, share, and question contemporary approaches to literature and the literary term associated with those critical approaches, while also creating and sharing a close analysis of a particular literary work.

Distribution: MR

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 310 - Modern Drama (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

This is a study of 19th and 20th century drama including dramatists such as Ibsen, Chekhov, Shaw, Strindberg, Sartre, Beckett, Ionesco, Brecht, Pirandello, Williams, Albee, Garcia, Lorca, and Genet.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 311 - The English Language (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

Cross-Listed as: COMM 311

This is an overview of the structure and history of the English language, and of its variation in different speech communities.

Distribution: MR

### **ENGL 312 - Chaucer and His Age (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

This is a study of Chaucer as literary artist and critic of his age. Emphasis is on *The Canterbury Tales*, materials describing the world of the 14th century, and the oral presentation of Chaucer's verse rather than a linguistic analysis of Middle English.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 314 - Shakespeare: Plays and Poems (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

This course surveys all of Shakespeare's work. Plays from all four dramatic genres (history, comedy, tragedy, and romance), representative sonnets, and selections from the two narrative poems will be read and discussed.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 315 - Shakespeare: The Tragedies (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

This course consists of intensive reading and discussion of Shakespeare's major tragedies.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 316 - Shakespeare: The Comedies and Histories (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

This course consists of intensive reading and discussion of Shakespeare's major comedies and history plays.

Distribution: MR

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 319 - Early 17th Century Prose and Poetry (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

This is a study of nondramatic poetry and prose from 1600 to 1660 including works by authors such as Bacon, Donne, Herbert, Marvell,

and the young Milton. The political, intellectual, and religious currents of the period are included.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 322 - 19th Century American Literature (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

This is a critical survey of 19th century American fiction and poetry. Readings cover major writers such as Cooper, Emerson, Hawthorne, Melville, Dickinson, Whitman, Jewett, James, Wharton, and Twain amidst other significant authors. The course will give students an understanding of major literary trends of the period-including the transcendentalist, romantic, and regionalist traditions-in the context of important cultural developments of the period.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 324 - Memoir: Sign of the Self (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

Sign of the Self introduces students to the genre of memoir. Students will consider the definition of memoir, conventional prompts for the writing of memoir, and reading strategies specific to the genre. The focus will be on written texts, though memoir in other media such as photography, graphic novels, film and video may be considered. With each text, the class will trace the ways the personal intersects with broader social and political categories like family, nation, gender, race and class.

This course satisfies one of the Writing Intensive course requirements for Arts and Sciences students.

### **ENGL 327 - Literature and Culture in England, 1780-1832 (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

This course examines the literary movement known as "romanticism" with attention to relevant cultural contexts (French Revolution, industrial development in England, British Nationalism/Imperialism). Students will read poetry, essays, and fiction by authors such as Burke, Wollstonecraft, Barbauld, Wordsworth, Coleridge, Austen, Keats, and Shelley.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 328 - Literature and Culture in England, 1832-1890 (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

This is a continued study of the significant attitudes and problems of the 19th century as expressed in poetry and prose. Readings are drawn from authors such as Carlyle, Mill, Tennyson, Dickens, Arnold, Hardy, and others.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 329 - Readings in 20th Century British Literature (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

This course is a study of selected authors, writings, issues, and ideas that have been associated with British "modernism." The focus is on both texts and contexts, recognizing and including in the analysis the sociopolitical, philosophical, religious, and literary influences at play in the early 20th century. Students will read poetry, essays, and fiction by authors such as Wilde, Yeats, Joyce, Eliot, Woolf, and others.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 333 - Independent Study in English (1-3 cr.)**

See "Independent Study".

### **ENGL 334 - Independent Study in English (1-3 cr.)**

See "Independent Study".

### **ENGL 336 - Ethnic American Literature (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

This is a critical study of the literature from American underrepresented writers: Black, Native, Hispanic, Asian, and Jewish Americans.

Distribution: A&SR/MR

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 338/411 - Major Authors (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

Investigating the important work of one to three major authors, this course will focus on the close reading of texts with attention, where appropriate, to the intellectual and cultural milieu. This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

This course may be repeated for credit with chair's permission, if the topic differs from previous enrollment.

### **ENGL 339 - Children's and Young Adult Literature (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair. ED 350 for students in Education program.

The course is an introduction to the field of children's literature. Its focus is primarily literary in nature, exploring the diverse literature written for children and young adults through reading, storytelling, meeting authors, and discussing works in class. Students are also introduced to the graphic artistry accompanying much of the literature and to a variety of cultures and traditions depicted in word and picture. The course furthers students' understanding of children and of the important role of home and school in literacy development.

Distribution: A&SR/MR

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

Formerly "Children's Literature"

### **ENGL 341 - Caribbean Writers (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

A survey of major Caribbean writers in both English and translation. Poetry, fiction, drama, and the oral traditions will be studied. Where appropriate, the cultural context of the works of literature will be explored.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 343 - Literature of Africa and the African Diaspora (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

The African continent encompasses many traditions; this course will introduce and study some of the major figures as well as the contexts in which they wrote. The relationship between African writers and writers of the African Diaspora (African American literature, Caribbean literature, Black British literature, etc.) will be delineated comparatively.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 345 - Major African American Writers (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

This course will concentrate on African American writers such as Wright, Ellison, Morrison, Bambara, and others who have contributed significantly to the African American Literature. Most readings will be novels but the short fiction of these writers will also be selectively read.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

This course may be repeated for credit with chair's permission, if the topic differs from previous enrollment.

### **ENGL 351 - Fiction Workshop (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

This course is an advanced creative writing course that places an emphasis on the craft of fiction. In this class, students will discuss works by contemporary writers, write and revise their own fiction, and respond to their peers' drafts.

Distribution: MR

This course satisfies one of the Writing Intensive course requirements for Arts and Sciences students.

This course can be repeated for credit with Chair's permission.

### **ENGL 352 - Poetry Workshop (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

This course is an upper level poetry workshop, concentrating on methods of creating and revising original poems to publishable quality. The objective is to encourage imagination; to learn what has already been tried and to play with new approaches, sources of inspiration, twists, and spins rather than repeating old ways; to understand and use different techniques of writing imaginatively in your own work and in analyzing creative work by others. The goal is to enlarge a critical vocabulary as well as an everyday one; to gain an ability to use poetic devices and poetic forms and to determine where, why, and how they are most useful. The workshop also seeks to increase knowledge of the historic development of poetry in the English and American traditions and to add to that tradition in your writing.

Distribution: MR

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

This course can be repeated for credit with Chair's permission.

### **ENGL 353 - Twentieth Century Poetry (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

This is a study of the dominant themes and innovative techniques in British and American poetry from 1900 to 1950 with particular attention to Yeats, Eliot, and Frost.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 354 - Creative Non-Fiction Workshop (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

This course focuses on the reading and writing of creative nonfiction, which uses literary techniques to write about factual events, real people, and actual places. It can include nature and travel-writing, memoir, essay, biography, and literary journalism, as well as scripts for documentary films. Students will practice a variety of nonfiction writing skills such as researching, interviewing, drafting, and revising, with the aim of completing a portfolio of publishable quality

work; they will also consider how to tailor their writing in order to submit it to an appropriate publication.

Distribution: MR

This course can be repeated for credit with Chair's permission.

This course satisfies one of the Writing Intensive course requirements for Arts and Sciences students.

### **ENGL 355 - The Development of The Novel (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

This course is a critical examination of the novel as an art form, from its origins to the 20th century. Emphasis is on major writers of the 19th and 20th centuries: American, British, and European. Works selected are by major authors such as Fielding, Austen, Bronte, Dickens, Eliot, Hawthorne, Flaubert, Dostoevsky, Tolstoy, Melville, Hardy, James, Conrad, Forster, Hemingway, and Faulkner.

This course satisfies the Humanities literature requirement for Arts and Sciences student

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 357 - Twentieth Century American Literature (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

This is a critical survey of 20th century American fiction, poetry, and drama. Emphasis is on major writers such as Wharton, Fitzgerald, Hemingway, Steinbeck, Faulkner, Cather, and Morrison.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 358 - Women in Literature (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

The purpose of the course is to introduce students to a rich representation of women's writing from a variety of genres and periods, when only few women wrote. Through the careful study of works by women with courage and eloquence, this course may become an experience of discovery for all of us—men and women alike.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 366 - Crime and Punishment (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

This course examines a diversity of crimes and their punishments in selected works of Western Literature. Unlike popular detectives and TV shows where the emphasis is on "whodunit," literature often identifies the criminal at the outset and explores, in unparalleled depth and richness, his or her inner landscape: motives, conscience,

reckoning, and growth. Through the study of crime in literary works spanning centuries, from Biblical stories and Greek tragedy through Shakespeare and Dostoevsky to contemporary literary criminals, this course will enhance our understanding of the psychological and moral complexity of crime in its diverse human and literary dimensions.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 370 - Writing about TV and Film (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

In this course students will learn various approaches to writing about film and television, including evaluative reviews and scholarly essays. As a Writing for the Web course, students will also learn to publish their own writing online with aesthetic and intellectual competence. Primary texts draw from a variety of film and television genres, historical periods, and subjects. Secondary sources include a writers' guide, movie and TV reviews, student writing, and scholarly essays. Because this is a Writing Intensive course, students will produce over 20 pages of revised writing.

Class meetings will combine lecture, discussion, screenings, peer review sessions and writing workshops.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 371 - Narrative and Digital Media (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

In this course students will study the intersection of narrative theory and digital media. The course begins with an introduction to core concepts in narratology – the study of how stories work. Students will explore the ways that these concepts allow us to understand how stories are told through old and new media, including video games and other materially interactive forms.

The course will also consider the ways that new media require revisions and additions to existing understandings of how narrative operates. Students will both study and produce online writing about video games and other new media forms.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **ENGL 376 - World Short Stories (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

This course examines stories written from a variety of cultures from around the world.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

**ENGL 386 - Biblical Heroes (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

This course studies heroes and their families from the Hebrew Bible (in English).

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

**ENGL 390-399 - Special Topics in English (1-3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

Topics offered depend upon student interests as well as interests of instructors.

This course may be repeated for credit if topic differs.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

**ENGL 410 - English Seminar (3 cr.)**

Prerequisite: Senior standing and 2 courses in ENGL writing w/grades of "C-" or better.

Intended primarily for English literature majors, this course is designed to enlarge and deepen the students' understanding of literary form and to enlarge their understanding of the human concerns that literature may treat.

Distribution: MR

This course satisfies one of the Writing Intensive course requirements for Arts and Sciences students.

**ENGL 411/338 - Major Authors (3 cr.)**

Prerequisite: Junior standing and "C-" or better in ENGL 133, or permission of English chair

Investigating the important work of one to three major authors, this course will focus on the close reading of texts with attention, where appropriate, to the intellectual and cultural milieu.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

This course may be repeated for credit with chair's permission, if the topic differs from previous enrollment.

**ENGL 480 - Internship in English (1-3 cr.)**

See "Internships".

**ENGL 481 - Internship in English (1-3 cr.)**

See "Internships".

**ENGR - ENGINEERING****ENGR 100 - Engineering Seminar & College Success Skills (2 cr.)**

Prerequisite: Freshman status in pre-engineering.

This is a course designed to introduce first-year pre-engineering students both to the engineering profession and to the practice of engineering as it relates to their university experience. Furthermore, the course is designed to assist students in promoting their academic success and personal development in college. Topics include goal setting and decision making, time management, communication, note taking, test taking, and study skills. Students will be assessed through performance on homework, written reports, and by participation in course activities.

Distribution: ER/GUR/MR

This course is a prerequisite.

Formerly "First Year Engineering Seminar"

**ENGR 102 - First Year Engineering Seminar (1 cr.)**

Prerequisite: Freshman Engineering major.

Cross-Listed as: HONE 102

This is a course designed to introduce first-year engineering students both to the engineering profession and to the practice of engineering as it relates to their university experience. It enables students to further develop academic and life management skills and to learn how to use University resources. Students will be assessed through performance on homework, written reports, and by participation in course activities.

Distribution: ER/GUR/MR

This course is a prerequisite.

**ENGR 103 - Introduction to Engineering (4 cr.)**

Prerequisite: Freshman Engineering major

This course is designed to introduce first-year engineering students to the engineering profession and its practices. The students complete various projects, including a major design project. Through these projects and other activities, the students learn about computer aided visualization, engineering analysis, sketching, critical thinking, ethical decision making, the design process, how to work in a team environment, problem formulation, design evaluation and selection, teamwork, oral presentation skills, and effective writing. Students are assessed through performance on projects, exams, quizzes, homework, written reports, and oral presentations.

Distribution: ER/GUR/MR

This course is a prerequisite.

**ENGR 105 - Computer Programming for Engineers (2 cr.)**

Prerequisite: College of Engineering student

Cross-Listed as: HONE 105

This is an introductory course in the design of software solutions to engineering problems using software capable of being programmed by the user. Students learn procedural approaches to designing small to medium-scale programs. After successfully completing this course, students understand the issues involved in moving from a general problem statement to a software solution. Students learn a variety of

software design solution techniques. They develop skills in logic, algorithm design, and data structure design and debugging. They apply these skills to a variety of engineering, mathematical, and numerical method problem areas. The methods of assessing student learning in the course are homework assignments; weekly quizzes; in-class, project-type programming assignments; and exams.

Distribution: ER/GUR/MR

This course is a prerequisite.

Fall'14 changed to 2 crs.

### **ENGR 110 - Data Acquisition and Processing (3 cr.)**

Prerequisite: ENGR 103

Cross-Listed as: HONE 110

This is an introductory course in computer - aided data acquisition and processing. Through a series of studio experiences, students will learn the principles necessary to design, implement, and analyze computer- controlled experiments. Industry standard LabVIEW along with programmable hardware will be the learning platform for this course. Additionally, students will be introduced to the concepts of product innovation and development as well as associated elements of entrepreneurship. Competency in the knowledge gained will be demonstrated by developing and demonstrating a fully functional 'smart product'. The methods of assessing student learning in the course will be homework assignments, weekly quizzes, laboratory experiments, exams, and a final project.

Distribution: ER/GUR/MR

This course is a prerequisite.

Fall'14 changed to 3 crs.

### **ENGR 333 - Independent Study in Engineering (1-3 cr. per semester)**

See "Independent Study".

### **ENGR 480 - Internship in Engineering (3 cr.)**

See "Internships".

### **ENGR 481 - Internship in Engineering (3 cr.)**

See "Internships".

## **ENTR - ENTRPRENEURSHIP**

### **ENTR 251 - Entrepreneurship and Innovation (3 cr.)**

Prerequisite: Sophomore Standing.

This is a basic course on entrepreneurship from which students will learn the role of entrepreneurial organizations in the U.S. economy and the entrepreneurial process of identifying problem opportunities, developing raw ideas or solutions, evaluating and selecting the best ideas, and developing business plans to the launch new products and innovations. The students will also learn the concepts, practices, and policies employed by successful entrepreneurs. The students will form Entrepreneurial Teams (E-Teams) to experience the entrepreneurial process. The E-Teams will conduct several analyses and make several presentations to the class throughout the process. This experience will teach the students the skills needed to create and launch new innovations for start-up, corporations, family businesses, government, or social organizations.

Distribution: MR

Formerly MAN 251

### **ENTR 326 - Venture Feasibility (3 cr.)**

Prerequisite: MK 200 and ENTR 251/MAN 251

This course will examine the transformation of a business idea into a business venture. The course and text are organized around the process of creating a new venture from recognition of an opportunity to the launch of the business. Part I reviews the foundations of entrepreneurship and entrepreneurial opportunity that are important to the understanding the decisions the entrepreneurs make, the environment in which they make these decisions, and the tasks they must understand before they launch a new company. Part II addresses the heart of entrepreneurial activity, i.e. the testing of a new business concept through feasibility analysis. Part III focuses on how the feasibility study fits into the business plan. Part IV examines the funding issues of launching the business and growing the business. The instructor will introduce a number of perspectives on various entrepreneurial concepts especially on the sources of new venture concepts, the concept of sea changes, and the nature of opportunities. Student teams will develop new ideas, test their commercial feasibility, and develop funding plans. Students will also be given the opportunity to represent Western New England in the annual Grinspoon Elevator Pitch competition in April.

Distribution: MR

Formerly MK 326

### **ENTR 333 - Independent Study in Entrepreneurship (3 cr.)**

See "Independent Study".

### **ENTR 334 - Independent Study in Entrepreneurship (3 cr.)**

See "Independent Study".

### **ENTR 380 - Global Entrepreneurship (3 cr.)**

Prerequisite: ENTR 251/MAN 251

This course is a practical course for students who may someday start, join, or hold a stake in a global enterprise venture. In addition, one of the newly emphasized themes will be that of the global entrepreneur, in recognition of the fact that increasingly, ventures are global from inception; and opportunities, resources, uncertainties, customers, and exits can come from anywhere, anytime. Thus, Global Entrepreneurship is targeted toward aspiring international and U.S. based entrepreneurs and their investors.

Distribution: MR

Formerly MAN 380

### **ENTR 430 - Family Business Management (3 cr.)**

Prerequisite: MAN 101/HONB 101 or MAN 204/HONB 204 or ENTR 251

Cross-Listed as: MAN 430

Family Enterprises have unique challenges, problems and issues such as starting-up and on-going decision-making issues with family members, handling conflicts involving family members and non-family members, family risk profiles, taxation, estate planning, multi-generation and succession issues, going public, and selling out. This course is particularly important for students who are planning to enter family businesses upon graduation.

**ENTR 480 - Internship in Entrepreneurship (3 cr.)**

See "Internships".

For this internship students would be required to spend 120 hours during the semester for a start-up business (in operation for less than 3 years) and submit a performance-learning report to their Faculty Sponsor and Site Supervisor.

Distribution: MR

credit change Fall'22 to 3 crs.

**ENTR 481 - Internship in Entrepreneurship (1-3 cr.)**

Prerequisite: Junior or Senior Standing

See "Internships".

For this internship students would be required to spend 120 hours during the semester for a start-up business (in operation for less than 3 years) and submit a performance-learning report to their Faculty Sponsor and Site Supervisor.

Distribution: MR

**FILM - FILM****FILM 102 - The History of Film (3 cr.)**

This course is an introduction to the history of film from its beginnings to the present moment, with a concentration on the American context. We will examine changes in film form and content as the medium reacts to the cultural, political, social, and technological changes in the world of which it is a part.

**FILM 103 - The Art of Film (3 cr.)**

This course is an introduction to film and its narrative and formal components. Students analyze the basic elements of film including narrative form, mise-en-scene, cinematography, editing and sound with focus on the way specific formal choices shape content.

Formerly FILM 203

**FILM 190 - Special Topics in Film (1-3 cr.)**

Topics in film that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

**FILM 201 - Studies in Mainstream Film Genres (3 cr.)**

Prerequisite: Sophomore standing.

This course focuses on a single film genre that is historically significant. The course considers genres like the Western, Melodrama, Film Noir, and Romantic Comedy. The class will focus on both enduring and evolving generic features.

Formerly FILM 301.

This course may be repeated for credit with chair's permission, if the topic differs from previous enrollment.

**FILM 202 - The Haunted Screen (3 cr.)**

Prerequisite: Sophomore standing.

A cinematic investigation of good, evil, nature, science, and gender through narratives of monstrous transformations. Films may include Frankenstein, Alien, Them, Dracula, The Exorcist, and The Silence of the Lambs.

Formerly FILM 302

**FILM 210 - Mass Media in Film (3 cr.)**

Prerequisite: Sophomore standing.

A critical investigation of how mass media are portrayed in such films as Citizen Kane, Radio Days, Atomic Café, Quiz Show, Network, and The Truman Show.

Formerly FILM 310

**FILM 290 - Special Topics in Film (1-3 cr.)**

Topics in film that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

**FILM 304 - Science Fiction Film (3 cr.)**

Prerequisite: Junior Standing

This course introduces students to the history and critical reception of science fiction as a cinematic genre. As we take in the spectacle of imagined future worlds, encounter aliens and androids, and explore the reaches of space, we'll find that these films which seem so obviously oriented toward the future tell us most, in fact, about the moments from which they come. Critical readings explore the ways these popular films reflect and shape the concerns of the cultures which produce them, reveal subconscious hopes and fears, and push the limits of cinema's distinctive modes of expression.

**FILM 312 - International Cinema (3 cr.)**

Prerequisite: Junior standing or permission of English chair

This course studies films made in a variety of countries outside the United States.

**FILM 320 - Introduction to Cinema Production (3 cr.)**

Prerequisite: Junior standing or permission of English chair

An introduction to the fundamentals of motion picture production, including dramatic development, visual storytelling, editing, and directing.

**FILM 321 - Introduction to Screenwriting (3 cr.)**

Prerequisite: Junior standing, or permission of English chair.

An introduction to writing for the screen. Topics include 3-act structure characterization, dialogue, theme, and pitching.

**FILM 333-334 - Independent Study in Film (1-3 cr.)**

See "Independent Study".

**FILM 340 - Director's Signature (3 cr.)**

Prerequisite: Junior standing or permission of English chair

This course will consider the body of work attributed to individual directors whose work has come to be considered canonical and



innovative. Directors include Alfred Hitchcock, John Ford, King Vidor, Robert Altman, and Francis Ford Coppola.

### **FILM 370 - Women and Film (3 cr.)**

Prerequisite: Junior standing.

This course examines the representation of women in different cinemas and the filmic structures that shape the way viewers look at women on screen. Students analyze the representation of women in mainstream, independent and experimental films including those made by women. Course readings draw from film criticism, feminist film theory and feminist writing in order to develop a critical vocabulary for analysis.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

Formerly FILM 212

### **FILM 390 - 393 - Special Topics in Film (1-3 cr.)**

Topics in film that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

## **FIN - FINANCE**

### **FIN 190 - Special Topics in Finance (3 cr.)**

This is a study of topics in finance of special interest to finance majors but not offered on a regular basis.

### **FIN 214 - Introduction to Finance (3 cr.)**

Prerequisite: MATH 111 or MATH 123, AC 101/HONB 203/AC 201, or concurrent.

This course introduces students to the broad financial world consisting of financial management, financial markets, and investments. Key outcomes include a basic understanding of investment vehicles such as stocks, bonds, and mutual funds, the ability to value future cash flows emanating from securities and projects, the ability to analyze financial statements and the ability to apply elementary working capital management concepts.

Additionally, all students will apply their knowledge in a realistic, simulated stock market trading exercise.

Distribution: BUSR/MR

Offered: fall and spring semesters.

This course is a prerequisite.

### **FIN 300 - Insurance and Risk (3 cr.)**

Prerequisite: Junior standing.

This is an analysis of the principles and practices of insurance and risk management. Topics include personal, business, and social aspects of life, health, property, and liability risks.

Distribution: MR

Offered: fall semester

### **FIN 312 - Financial Markets and Institutions (3 cr.)**

Prerequisite: FIN 214 and EC 111

This course studies how markets and institutions in the financial system gather and allocate resources. Key outcomes include understanding how financial intermediaries operate, the flow of funds among them, financial policy, the regulatory environment, and the ethical standards of conduct among agents of the financial system.

Distribution: MR

Offered: in the spring semester.

### **FIN 317 - Investments (3 cr.)**

Prerequisite: FIN 214

This course is a study of the theories of risk and return that underlie decisions about the allocation of wealth among competing investment vehicles. Key outcomes include the ability to measure and manage risk and return as it applies to equity securities and their derivatives through modern portfolio diversification techniques.

Distribution: MR

Offered: in fall and spring semesters.

Formerly FIN 417

This course is a prerequisite.

### **FIN 318 - Security Analysis (3 cr.)**

Prerequisite: Grade of C- or better in FIN 317

This course is a study of how publicly available information can be used to determine both the intrinsic value and credit worthiness of a business enterprise. Key outcomes include the ability to perform professional level financial statement analysis, industry analysis, and risk assessment.

Distribution: MR

Offered: in fall and spring semesters.

Formerly FIN 418

### **FIN 320 - Intermediate Corporate Finance (3 cr.)**

Prerequisite: FIN 214

This course provides the student with an understanding of finance theory and a working knowledge of financial strategies. Key outcomes include the ability to perform corporate-level financial analysis, to pursue value-based management, to perform capital budgeting, to determine cost of capital, and to make both short-term and long-term financing decisions.

Distribution: MR

Offered: in fall and spring semesters.

This course is a prerequisite.

Formerly "Intermediate Corporation Finance"

### **FIN 322 - International Finance (3 cr.)**

Prerequisite: FIN 214, EC 111, and EC 112.

This is a study of the international dimensions of financial management. Key outcomes include a knowledge of international financial markets; the ability to measure and control economic, contractual, and translation risk; the ability to engage in international

working capital management; and a knowledge of how funds are secured internationally.

Distribution: CR

Offered: in the fall semester.

### **FIN 330 - Financing Entrepreneurial Ventures (3 cr.)**

Prerequisite: FIN 214.

This course covers various aspects of finance in an entrepreneurial venture. Major topics include attracting seed and growth capital from sources such as venture capital, investment banking, government, and commercial banks. Among the issues discussed are different legal forms of organization, taxes, valuing a company, and exit strategies (going public, selling out, acquisitions, and bankruptcy).

Distribution: MR

Offered: in the spring semester in odd numbered years

### **FIN 333 - Independent Study in Finance (3 cr.)**

See "Independent Study".

### **FIN 334 - Independent Study in Finance (3 cr.)**

See "Independent Study".

### **FIN 340 - Introduction to Financial Planning (3 cr.)**

Prerequisite: EC 111, AC 101/HONB 203/AC 201, and FIN 214.

This course is an overview of how comprehensive plans for families and individuals are formulated by professional financial planners. Topics include developing client relationships, risk management through insurance planning, investment planning, retirement planning, tax planning and estate planning.

Offered: in the spring semester.

### **FIN 350 - Advanced Corporate Finance (3 cr.)**

Prerequisite: Grade of C or better in FIN 320

The key outcome of this course is the ability to apply the concepts and tools of financial management learned in FIN 214 and FIN 320 to real-world situations. Students will also learn to explain their decisions through written and oral communication.

Distribution: MR

Offered: in fall and spring semesters.

Formerly "Advanced Corporation Finance"

### **FIN 382 - Healthcare Finance (3 cr.)**

Prerequisite: FIN 214, AC 202

This course uses the case method of study to apply basic financial skills to four areas of concern to healthcare institutions: Financial Analysis and Performance Evaluation, Managerial Accounting, Capital Acquisition, Capital Budgeting, and Working Capital Management.

Offered: in the spring semester

### **FIN 390 - Special Topics in Finance (3 cr.)**

This is a study of advanced topics in finance of special interest to finance majors but not offered on a regular basis.

### **FIN 405 - Financial Statement Analysis (3 cr.)**

Prerequisite: FIN 214, AC 305 or FIN 320

This course is a study of generally accepted accounting practices with a goal of developing skills in interpreting and analyzing financial reports from an external point of view. The main focus is on the value of financial statements in making investment and credit decisions. The course begins with an overview of how financial statements are generated, followed by the canon of analytical techniques. The course will conclude with a discussion of how managers choose among acceptable techniques and a comparison between U.S. and International standards.

Distribution: MR

Offered: in the fall semester.

### **FIN 425 - Portfolio Management (3 cr.)**

Prerequisite: Grade of C- or better in FIN 317

This is a course in equity portfolio management that applies financial theory and conventionally accepted practice to the management and assessment of a diversified portfolio designed to outperform a broad-based index such as the S&P 500 Index. Students perform economic, industry and company analysis to select companies to include in portfolio. The portfolio is maintained and monitored by conventional metrics including attribution analysis.

Offered: fall and spring semester

### **FIN 480 - Internship in Finance (3 cr.)**

See "Internships".

### **FIN 481 - Internship in Finance (3 cr.)**

See "Internships".

## **FLAN - FOREIGN LANGUAGE**

### **FLAN 190 - Special Topics in Foreign Language (1-3 cr.)**

Topics in Foreign Language that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **FLAN 191 - Special Topics in Foreign Language (1-3 cr.)**

Topics in Foreign Language that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

## **FR - FRENCH**

### **FR 101 - Elementary French Conversation I (3 cr.)**

This is an "immersion" course in French language and culture using the innovative Capretz French in Action method that combines video, audio, and print materials. Digital audio program on CD-ROM used. One hour of lab per week.

Offered: every fall.

Formerly Elementary French I

**FR 102 - Elementary French Conversation II (3 cr.)**

Prerequisite: FR 101 or the equivalent.

This is a continuation of French in Action. Digital audio program on CD-ROM used. One hour of lab per week.

Offered: every spring.

Formerly Elementary French II

**FR 190 - Special Topics in French (1-3 cr.)**

Topics in French that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

**FR 203 - Intermediate French Conversation I (3 cr.)**

Prerequisite: FR 102 or the equivalent.

This is a continuation of French in Action. Digital audio program on CD-ROM used.

Offered: every fall.

Formerly Intermediate French I

**FR 204 - Intermediate French Conversation II (3 cr.)**

Prerequisite: FR 203 or the equivalent.

This is a continuation of French in Action. The emphasis is on fluent oral reports based on articles from current French publications. Digital audio program on CD-ROM used.

Offered: every spring.

Formerly Intermediate French II

**FR 290 - Special Topics in French (1-3 cr.)**

Topics in French that are not offered on a regular basis are studied. The course may be repeated for credit if the topic varies.

**FS - FORENSIC SCIENCE**

**FS 152 - Crime, Science, And Justice. (3 cr.)**

Prerequisite: PHYS 101/PHYS 103/PHYS 105/PHYS 123/PHYS 132/PHYS 133, METR 101, CHEM 101/CHEM 103/CHEM 105, GEOL 101, or BIO 101/BIO 103 or BIO 107/BIO 117

In the United States since 1989, there have been hundreds of post-conviction DNA exonerations in criminal cases. These exonerations have taken place across the entire country and are not limited to geographical areas. Many of those exonerated were serving sentences on Death Row awaiting execution at the time of their exoneration and served an average of 12 years in prison before their release. This course will present the background, causes, and processes to prevent unjustified convictions in future criminal cases. Actual cases will be studied in detail. The course is presented to all students as an informative modern day discussion on this important topic (NSP).

**FS 190 - Special Topics in Forensic Science (1-3 cr.)**

Topics in forensic science that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

**FS 201 - Introduction to Forensics (4 cr.)**

Prerequisite: CJ 101 and FB or FC major or permission.

This course introduces students to the criminalistics concepts of crime scene procedures, techniques, and reconstruction pattern analysis. Even though this course is designed for students who have little or no science background, basic scientific measurements will assist in understanding the methods behind forensic science and its application to the legal system. Usually associated with law enforcement, the forensic scientist plays an increasingly active role in the civil and criminal justice arenas.

Offered: in the fall semester

Fall'14 changed to 4 crs.

Three lecture hours, one three-hour lab.

Lab fee \$100.

**FS 240 - Scientific Evidence (3 cr.)**

Prerequisite: FS 201, BIO 107/BIO 117, and CJ 101.

This course introduces the forensic science major to the theories of scientific evidence. After a brief study of the history, theory, and application of the rules of evidence in complex civil and criminal matters, the course will specifically focus on the procedures of qualification of expert witnesses and various scientific disciplines relative to the admissibility of expert testimony and scientifically-based evidence through each stage of a legal proceedings. The course will include both the civil and criminal trial processes, definitions of scientific evidence, and qualification of expert witnesses. These topics and the procedures for validating scientific evidence disciplines will be studied in detail through actual case studies from various U. S. judicial jurisdictions.

Distribution: MR

Offered: in the spring semester

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences' students.

**FS 290 - Special Topics in Forensic Science (1-3 cr.)**

Topics in forensic science that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

**FS 310 - Crime Scene Processing (3 cr.)**

Prerequisite: FS 201 and FS 240; CHEM 209 or concurrently. Forensic Biology and Forensic Chemistry majors only.

This course presents a detailed study of crime scene investigation through the eyes of the forensic scientist. The course, for the forensic science major, illustrates the role of the forensic scientist in responding to the crime scene and follows an investigation through the trial process. A major focus will be evidence recognition, documentation, and collection techniques at the crime scene. A detailed analysis of the developing common law is included so that the student will be immersed in the legal processes of major criminal investigations.

Distribution: MR

Offered: in the fall semester

**FS 333 - Independent Study in Forensic Science (1-3 cr.)**

See "Independent Study"

**FS 334 - Independent Study in Forensic Science (1-3 cr.)**

See "Independent Study"

### **FS 390 - Special Topics in Forensic Science (1-3 cr.)**

Topics in forensic science that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **FS 425 - Criminalistics I (4 cr.)**

Prerequisite: FS 310 and CHEM 210.

This is an in-depth study of the recognition, collection, processing, and examination physical evidence typically found at crime scenes. Emphasis is placed on the laboratory techniques used in studying physical evidence. Topics are drawn from biology, chemistry, and physics.

Distribution: MR

Offered: in the fall semester

Fall'14 changed to 4 crs.

Three lecture hours, and one three-hour lab.

Formerly FS 325

Lab fee \$100.

### **FS 426 - Criminalistics II (4 cr.)**

Prerequisite: FS 325/FS 425 and CHEM 210; CHEM 312 or BIO 401

This course is designed to provide students with a strong theoretical and experimental background in forensic science applications and techniques, including proper documentation and communication of laboratory data. Through an integrated lab-lecture approach, the chemical, biological, and physical processes underlying the sampling, storage, and analysis of evidence will be studied.

Distribution: MR

Offered: in the spring semester

Three lecture hours, and one three-hour lab.

Lab fee \$100.

### **FS 440 - Undergraduate Research (1-3 cr.)**

See "Undergraduate Research"

Laboratory fees may be required.

### **FS 441 - Undergraduate Research (1-3 cr.)**

Prerequisite: FS 440

See "Undergraduate Research"

This course is a continuation of FS 440.

Laboratory fees may be required.

### **FS 480 - Internship in Forensic Chemistry and Forensic Biology (1-3 cr.)**

See "Internships".

Distribution: MR

### **FS 481 - Internship in Forensic Chemistry and Forensic Biology (1-3 cr.)**

See "Internships".

Distribution: MR

### **FS 490 - Special Topics in Forensic Science (1-3 cr.)**

Members of the forensic science faculty offer selected topics in their areas of specialty. These courses are not offered on a regular basis and may be repeated for credit if the topic differ

Laboratory fees may be required.

## **GEOG - GEOGRAPHY**

### **GEOG 102 - World Regional Geography I: Highly Developed Countries (3 cr.)**

This survey of world geography is designed to help you develop a greater understanding of the advanced industrialized and highly developed societies of North America, Europe, Russia, East Asia and Oceania. Greater familiarity with these places will help you to appreciate the challenges confronting the more affluent parts of the world. All face issues like aging populations, increasingly costly social insurance systems, deindustrialization, and growing multiculturalism. The class puts special emphasis on the ways in which the changing global environment and an increasingly interdependent global economy are impacting political, environmental, social and cultural dimensions in all of these regions.

### **GEOG 103 - World Regional Geography II: Less Developed Countries (3 cr.)**

This survey of world geography is designed to help you develop a greater understanding of the rapidly developing societies of Middle and South America, North Africa and Southwest Asia, Sub-Saharan Africa, South Asia and Southeast Asia. Developing a better understanding of these places will illustrate challenges associated with rapid population growth, urbanization, environmental stresses, industrialization, and dependence on raw material production in a highly competitive in a global market. This class will promote a better appreciation for the ways in which the changing global environment and an increasingly interdependent global economy are impacting political, environmental, social and cultural dimensions of all of these regions.

### **GEOG 110 - Geography of United States and Canada (3 cr.)**

This course is an introduction to the discipline of geography that offers case studies and analysis from the United States and Canada. Themes covered in this course include surveys of physical features of the region, historic settlement and population patterns, agriculture and extractive industries, manufacturing organization, transportation systems, urbanization, environmental impact, and cultural geography.

Distribution: MR

## **GEOL - GEOLOGY**

### **GEOL 101 - Physical Geology (3 cr.)**

This is a systematic study of the planet Earth with emphasis on the forces, processes, and materials that are responsible for the more familiar land forms. Two class hours, three-hour lab or field trip.

Laboratory fee \$100.

**HIST - HISTORY****HIST 111 - United States History to 1877 (3 cr.)**

This is an introduction to U.S. history with special emphasis on the colonial period, the American Revolution, the New Nation, Westward Expansion, the Civil War, and Reconstruction.

Distribution: GUR/MR

**HIST 112 - United States History, 1878 to the Present (3 cr.)**

This is a survey of U.S. history with special emphasis on economic revolution, U.S. involvement in World War I, the Great Depression, the New Deal, World War II, the Cold War, and contemporary America.

Distribution: MR

**HIST 132 - Early Modern Europe 1500-1815 (3 cr.)**

This course surveys the cultural, intellectual, social, political, and economic changes in Europe between 1500 and 1815. Central themes include the contemporary understanding of the human person, class status, gender roles, and the wider world known to early modern Europeans. The course considers topics such as the Protestant and Catholic Reformations, absolutism, colonialism, the scientific revolution, the enlightenment, the French Revolution, the Napoleonic period, and the advent of industrialization.

Formerly HIST 232 Early Modern Europe 1500-1815

**HIST 133 - Modern Europe, 1815-present (3 cr.)**

This course examines the history of modern Europe from the Congress of Vienna to the present from a political, social, cultural, and intellectual history perspective. Dominant themes include nationalism, wars and revolutions, science and industry, socialism, fascism, the welfare state, feminism, the European Union, and globalization.

Formerly HIST 233 Modern European History, 1815-present

**HIST 140 - Stonehenge to Spice Girls: A Brief History of England (3 cr.)**

This course offers a one-semester introduction to the history of England from prehistory to the present with an emphasis on social history. It is intended primarily for non-history majors.

**HIST 170 - Colonial Latin American History (3 cr.)**

This course surveys the fascinating history of Spanish and Portuguese colonies in America (1500-1800). How did indigenous, Iberian and African peoples change with contact and coexistence? What political and economic institutions developed? How did socioracial and cultural identities transform? How did colonial Latin America influence global society and culture? It examines specific individuals, groups, and regions to recognize commonality and difference, as well as patterns of continuity and change over time in colonial Latin America.

Formerly HIST 270

**HIST 171 - Modern Latin American History (3 cr.)**

This course explores the dramatic history of Latin America since independence from Spain and Portugal (1800-present). How did legacies of colonial rule shape the new nations of Latin America? How did different Latin Americans envision democracy, define citizenship, and debate equality? How did Latin Americans embrace, reject, and change capitalism? How have different peoples, cultures, and ideas created such diversity across Latin America? How have Latin Americans interacted with and influenced the United States and the world?

Formerly HIST 271

**HIST 190 - Special Topics in History (1-3 cr.)**

Topics in history that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

**HIST 201 - Technology and Society (3cr.)**

This course examines the influence of technology on the development of the modern world. Technological changes have given rise to particular forms of economic and business organization, shaped cultures, allowed the rise of mass society, and had significant political ramifications. The course will use several technological breakthroughs as case studies to examine these effects.

**HIST 204 - Ancient Greece and Rome, 1000 BCE-300 CE (3 cr.)**

This course will cover the rise and fall of classical civilization in the Mediterranean from the Heroic Age in Greece through the decline of the Roman Empire, with particular emphasis on life in the cities of Athens and Rome.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

**HIST 205 - World History, Prehistory-1500CE (3 cr.)**

This course is an introductory survey of world history to 1500. Focusing on the rise of the world's major civilizations and religions. The emphasis is on the social and political history of Europe, Asia, Africa, and the Americas.

Distribution: GUR/MR

Formerly HIST 105 World Civilization I

**HIST 206 - World History, 1500CE-Present (3 cr.)**

This course explores continuity and change in world history from 1500CE to the present. It asks how interactions in the past between Africa, the Americas, Asia, and Europe shaped the patterns and processes of today's world. It examines specific encounters, empires, colonies and nations to understand the interrelated histories of today's world societies, governments, economies, and cultures.

Distribution: A&SR/GUR/MR

Formerly HIST 106 World Civilization II

**HIST 208 - Medieval Europe, 300-1300 CE (3 cr.)**

This course covers European history from the fall of Rome to the beginnings of the Italian Renaissance and explores the social, political, and cultural changes that took place during this period. Note: this course replaces HIST 307 and HIST 309 and cannot be taken for credit by students who have already taken either of those courses.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

Formerly HIST 308

### **HIST 212 - London through the Ages (3 cr.)**

Cross-Listed as: ART 212

This two-week summer course taught in London covers the history and culture of the city from the Roman period to the present day, and features extensive exploration of the city and its historic sites.

Satisfies either the cultural studies perspective or historical perspective requirement.

### **HIST 250 - Colonial North America (3 cr.)**

Prerequisite: Junior or Senior Standing.

This course examines the people and events that shaped America in the years before the creation of the United States. Because the traditional focus on the English experience overlooks the influential roles of other European nations and indigenous peoples in the process of colonization, we will begin with Columbus's "discovery" of the New World and study Spanish, French, and Dutch influences on America along with the English colonization effort. The role of various Native American societies in shaping colonial America, both as rivals and allies, will also receive extensive attention.

Formerly HIST 350 Colonial America

### **HIST 251 - Early American Women's History to 1865 (3 cr.)**

The purpose of this course is to introduce students to the diverse experiences of women in American history, which until recent decades had been largely ignored. Today, however, women's history and gender studies are two of the fastest growing and most promising fields of historical inquiry, offering students new perspectives on the nation's past and providing them with a framework to assess their own lives. This particular course will focus on the early years of American history, roughly from the 1500s to the 1860s, and cover such topics as colonial gender roles, the impact of the Revolution on women's status, gender and slavery in the Old South, and women's roles in opening the West.

### **HIST 253 - War and American Society (3 cr.)**

From the woodlands of New England to the muddy trenches of France, war waged in support of American civilization has often transformed the very society and values it was meant to protect. This course examines the changes warfare has wrought upon American society from its origins in the colonial era through the emergence of modern warfare in the early twentieth century. Topics addressed include the cultural implications of war in Native American societies, the controversy over standing armies during the Revolution, antiwar sentiment, women in war, and the impact of technology upon American military strategy.

### **HIST 254 - Sectional Crisis and Civil War (3 cr.)**

This course examines the social and cultural forces giving rise to the political conflicts in antebellum America that exploded into civil war between 1861 and 1865. Topics covered include slavery and abolitionism, American nationalism in an expanding republic, the Southern secessionist movement and disunion, battlefields and home fronts, and the trauma of modern war.

Formerly HIST 354

Formerly Civil War and Reconstruction

### **HIST 256 - History Of American Pop Culture (3 cr.)**

This course will examine the history and role of popular culture in shaping the experiences, identities, and even lives of Americans today. From film to video games to the Internet, from paperbacks and music and television, this course will consider how pop culture might be the last common ground left in a nation that is otherwise increasingly divided.

This course fulfills the History general university requirement.

### **HIST 259 - The United States in Vietnam (3 cr.)**

This course examines U.S. policy in Vietnam within the context of Vietnamese history and culture with special emphasis on Vietnamese nationalism, the French colonial period, both Indochina Wars, and the evolution of U.S. policy from the Truman presidency through the Nixon administration.

Formerly HIST 359

### **HIST 260 - The History of Pre-Colonial Africa (3 cr.)**

This is a thematic survey of the history of Africa up to the late 1890s with special emphasis on the Neolithic revolution, the rise of African states, the trans-Atlantic slave trade, and the prelude to colonialism.

### **HIST 261 - Modern African History (3 cr.)**

This course examines the origins of colonialism and the conquest of Africa. The development of colonial society and economy is explored on a regional basis. The course ends with the rise of new independent African states.

Formerly "Africa in the Twentieth Century"

### **HIST 276 - Spain: Nation and Culture (3 cr.)**

Cross-Listed as: CUL 276

What does it mean to be "Spanish"? This course aims to help students understand this complicated and much-debated question by exploring the diverse cultures and politics of culture that define modern Spain. From a hinterland of the Roman Empire, the region transformed dramatically with 700 years of Islamic rule, 500 years of Catholic monarchy and global empire, a devastating civil war, Franco's 40-year dictatorship, and the return to democracy in the 1970s. We trace how events, interactions, and cultural issues from Spain's past shape the present: religions, gender and family roles, political values, ethnic identities, immigration, and controversies about iconic traditions like bullfighting and flamenco.

### **HIST 277 - Colombia: Nation and Culture (3 cr.)**

Cross-Listed as: CUL 277

Colombia is a complex country of cultural, ethnic, and ecological diversity. This course introduces students to the indigenous, Spanish, and African foundations of modern Colombia's multi-ethnic regional identities. Using scholarship, memoirs, art, and film, we examine Colombians' responses to uneven development, inequality, political conflict, and violence to learn how they have created meaningful ways of life despite these challenges. Topics include: customs, values, and religion; arts, music, and sports; land, labor, and exports (gold, coffee, bananas, flowers, cocaine); violence, displacement, and human rights.

Satisfies Elements of Culture requirement "C" or the Historical Perspective.

### **HIST 289 - Sophomore Methods Seminar (3 cr.)**

Prerequisite: Six credits of 100-level history.

This course provides a general introduction to historiography and historical research methods by focusing on a specific historical problem.

### **HIST 290 - Special Topics in History (1-3 cr.)**

Topics in history that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **HIST 310 - Medieval Architecture and Society (3 cr.)**

Prerequisite: Junior standing.

Cross-Listed as: ART 310

This course examines the monuments of medieval architecture in their historical context. We will study knightly castles and peasant cottages as well as the great Romanesque and Gothic abbeys and cathedrals, with the ultimate goal of learning not only about the buildings themselves but the society that created them.

Satisfies either the aesthetic perspective or historical perspective requirement.

### **HIST 320 - The Twentieth Century World (3 cr.)**

Prerequisite: Junior standing.

This course explores the forces and conditions that shaped events of the fastest changing century in human history. Themes will include the World Wars, the rise and fall of the Soviet Union, colonization and decolonization, globalization, and technology.

Distribution: MR

### **HIST 333 - Independent Study in History (1-3 cr.)**

See "Independent Study".

### **HIST 334 - Independent Study in History (1-3 cr.)**

See "Independent Study".

### **HIST 336 - Early American Republic (3 cr.)**

Prerequisite: Junior standing or permission of the instructor.

This course examines the creation and evolution of the American nation from its inception in 1776 to the outbreak of the Civil War in 1861. Forged out of the fires of war and revolution, the new United States faced the difficult task of securing unto itself a republican government while establishing a role in the international community. How it did so, and with what success, will be studied through such

topics as patriotism and party politics, national identity and American folklore, and the "empire of liberty" and westward expansion. New England's changing role in the early republic will be given special emphasis.

### **HIST 341 - German History since 1871 (3 cr.)**

Prerequisite: Junior standing.

Taking as its starting point the foundation of Germany in 1871, this course analyzes social, cultural, and economic issues at stake as the German nation experimented with a variety of political institutions under a constitutional monarchy, the Weimar Republic, National Socialism, Cold War division, and finally reunification in 1990. Themes such as social class, gender, religion, generation, and ideology serve as tools of analysis in this investigation of modern Germany.

Distribution: MR

### **HIST 343 - East German Society and Culture, 1949-1989 (3 cr.)**

Prerequisite: Junior standing.

This course is designed to introduce students to the history of East German society and culture from the foundation of the German Democratic Republic through the velvet revolution of 1989 and the demise of the regime. While the course will focus predominantly on the period 1949-1989, a brief exploration of postwar conditions and the Soviet Occupation, 1945-1949, will provide the students with sufficient historical background to better evaluate the main period under investigation.

### **HIST 345 - World War II and the Holocaust in Europe (3 cr.)**

Prerequisite: Junior standing.

This course investigates the Second World War in Europe between 1939 and 1945. Students will gain a sense of the historical background of the conflict, including the rise of Italian and German variants of fascism. Main themes include the concept of total war, Operation Barbarossa, allied campaigns, occupation and resistance, anti-Semitism, the Holocaust, the post-war settlement, and memory of the war and wartime atrocities.

### **HIST 346 - The History of the British Isles, 1870-Present (3 cr.)**

Prerequisite: Junior standing.

From the late Victorian period through to the present, this course examines the history of the British Isles including England, Wales, Scotland, and Ireland. Important consideration will be given to topics such as gender roles and experiences, class identity and class conflict, enfranchisement, imperialism, the world wars, decolonization, immigration, postwar youth culture, and globalization.

### **HIST 351 - The American Revolution 1765-1789 (3 cr.)**

Prerequisite: Junior standing.

This course examines the transformation of Britain's American colonies into the United States between 1765 and 1789. Topics discussed include the changing character of imperial politics, the problems of waging revolutionary war, and the Revolution's impact on American society.

### **HIST 355 - Watching War (3 cr.)**

Prerequisite: Junior or Senior standing.

A constant in the contemporary instruction and understanding of American history is the centrality of war. To the American public, these wars have often manifested themselves in film. As filmmakers and audiences alike strive to find the "real experience" or "real meaning" of a war in what is usually less than two hours. From the Revolutionary War to the Iraq War, our understanding of history since the invention of the motion picture has been inextricably tied to what we watch. The film industry constantly revisits and even reinvents past conflicts in their movies, in the process, shifting our collective understanding of the past and changing our attitudes toward present and future conflicts. This course will examine how movies shape our understanding of American history and mythology, and will seek to place these films in a proper historical context.

### **HIST 356 - A City Upon a Hill: Boston, Massachusetts, 1630-1865 (3 cr.)**

Prerequisite: Junior standing.

The purpose of this course is to introduce students to the origins and evolution of Boston, Massachusetts, as both a city and a community. From its Puritan beginnings to its role in the American Revolution and later the antislavery movement, Boston has not only fascinated the general public, but also captured the imaginations of individual poets, writers, and artists. This course combines a variety of sources to explore the character of urban life and culture in the dynamic metropolis. Among other issues, we will address the importance of Boston's Puritan origins, examine its function as a commercial seaport within Massachusetts as well as both the British Empire and the American union, and assess its role in the American Revolution. Social interaction and cultural exchange among Bostonians will also constitute a major theme of the course. In this regard, we will examine life in Boston for various ethnic and racial communities, including French Catholics, African Americans, and Irish immigrants, as well as explore important sites of public interaction in the city such as Boston Common. Finally, we will also consider the means by which modern-day Boston has sought to preserve its historical landmarks amid continued urban development.

### **HIST 357 - New York City (3 cr.)**

Prerequisite: Junior standing.

New York City-as the world was reminded on September 11, 2001-is a global capital, a symbol of American dominance and vulnerability in the 21st century. The story of how the city came to occupy this position is central to the history of America and the modern world. This course is also a local history, for as countless observers have noted, New York is different. A historical analysis of the city offers a glimpse into the best and worst of all worlds, and it remains to be seen whether New York will be the model of the future or a monument to the past and what might have been.

### **HIST 358 - History of The United States Since 1945 (3 cr.)**

Prerequisite: Junior standing.

This course will begin with an examination of how America came to be so powerful in 1945, and will continue through the present, covering such themes and events as the Cold War, Vietnam, the Civil Rights Movement, the "Reagan revolution," and the paradox of affluence and poverty. The course will end with a consideration of America's challenges, opportunities, and responsibilities in the post-Cold War world.

### **HIST 365 - The Rise of Islam and the Caliphates: 500-1500 (3 cr.)**

Prerequisite: Junior standing.

This course examines the origins of the Islamic religion, its contribution to the development of a new political model, the Caliphate, and the impact the Caliphate as an institution had on the formation of the Islamic world from historical, theological, social, and political viewpoints. Topics will include pre-Islamic Arabia, the life of the Prophet Muhammad and his role as the first Muslim leader, the history and significance of the Rashidun, Umayyad, Abbasid, and Fatimid Caliphates, and the ways in which the institution continued to influence ideas of Islamic thought and governance during the later Middle Ages. The course will conclude by studying how modern political groups such as ISIS make use of the medieval idea of the Caliphate today.

### **HIST 372 - Latin American Revolutions (3 cr.)**

Prerequisite: Junior standing.

This course will examine several ways in which social movements in Latin America have been defined and analyzed by historians and social scientists. We will consider the circumstances under which people act collectively; how people respond to revolutionary transformations; and how economic, social, and cultural contexts limit or expand the scope of such activity. We will also give special attention to evaluating the kinds of sources that social scientists (historians, political scientists, anthropologists, and economists) employ in their studies of society, action, and change. We will focus on cases from Peru, Colombia, Mexico, Bolivia, and Brazil in the twentieth and twenty-first centuries. However, this will entail investigation into the historical roots of violent and non-violent movements and broader comparisons across Latin American and world societies.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

Formerly "Rioters, Rebels and Revolutionaries in Latin America"

### **HIST 373 - Women In Latin America (3 cr.)**

Prerequisite: Junior standing.

This course considers Latin American history through the lens of women's social and political mobilization in the region from the late colonial period to the present. Gender, power, and the creation of identities in Latin America will be explored. Particular attention will be paid to the relationship between the ideologies of gender, class, and race. These scholarly concerns will take us into the household, workplace, and civil society. Chronologically, the course begins in the late colonial period (1770-1810) and extends through contemporary urban popular movements (1970-2000) in order to examine different moments of social and political activism involving, motivated, or impeded by women.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **HIST 374 - Latin America - U.S. Relations (3 cr.)**

Prerequisite: Junior or senior standing.



This course explores the intertwined histories of Latin America, the U.S. and the world (1800-present). Why have societies so connected by cultural, commercial, and migratory ties been at odds so often? How have Latin American nations forged their foreign policy and influenced others? How have Latin American perceptions of the U.S. changed over time? The course highlights social and cultural history of Latin American foreign relations, such as; perceptions of racial and cultural inferiority; military and intelligence agencies; trade and labor; radio, television, and film industry influence.

Students may register for this course as HIST or INST.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **HIST 375 - History of Modern East Asia (3 cr.)**

Prerequisite: Junior standing.

This course examines the radical transformation of East Asia over the last 150 years, from humbled nations to world powers. For China, this course begins with the Opium War (1839-1842), after which China was forced to cede Hong Kong to the British; it concludes with the return of Hong Kong in 1997 and rising Western fears over the path China might take as the next superpower. For Japan, this course begins with its "opening" to Western trade in the 1850s, and ends with Japan seeking to find its way in the turbulent economic and cultural currents of the 1990s.

### **HIST 380 - The Development of Modern Medicine (3 cr.)**

Prerequisite: Junior standing.

This course traces the late 18th century to the present in three interrelated themes: the intellectual history of our current system of medicine, the social history of the medical profession, and changing patterns of health and disease.

### **HIST 390-394 - Special Topics in History (3 cr.)**

Prerequisite: Junior standing.

Topics of this course vary from year to year depending on faculty and student interests. This course may be repeated if topic differs.

### **HIST 440 - Undergraduate Research in History (1-3 cr.)**

Prerequisite: Junior standing and permission of instructor.

See "Undergraduate Research (p. 33)".

### **HIST 480 - Internship in History (1-3 cr.)**

See "Internships".

### **HIST 481 - Internship in History (1-3 cr.)**

See "Internships".

### **HIST 490 - Junior and Senior Seminar in History (4 cr.)**

Prerequisite: Junior standing.

Topics of this course vary from year depending on faculty and students interests. This course may be repeated if topic differs.

Distribution: MR

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

From 3 credits to 4 credits in Fall'19.

### **HIST 495 - Senior Thesis in History (2 cr.)**

Prerequisite: 15 crs of HIST, Senior standing, & permission of instructor.

This two-course sequence represents the capstone course of the history major. Senior students select a topic in the first semester and carry out supervised research. In the second semester, students write up their projects under a faculty member's direction and defend the final project before the history faculty.

Distribution: MR

### **HIST 496 - Senior Thesis in History (2 cr.)**

Prerequisite: 15 crs of HIST, Senior standing, & permission of instructor.

This two-course sequence represents the capstone course of the history major. Senior students select a topic in the first semester and carry out supervised research. In the second semester, students write up their projects under a faculty member's direction and defend the final project before the history faculty.

Distribution: MR

## **HON - ARTS & SCIENCES HONORS PROGRAM**

### **HON 102 - Cities and Societies (3 cr.)**

Prerequisite: Acceptance into Honors Program

Cities have had a disproportionate influence on the development of human society, and it is in cities that one can best see much of the creation and interaction of cultures. This course takes a broad view of culture, including such familiar areas as art, literature, and philosophy, but also the cultures of the workplace, the family, and politics.

Offered: in fall only.

This course fulfills the general university-wide history requirement or the university-wide cultures requirement.

### **HON 140 - HONORS Introduction to Psychology (3 cr.)**

Prerequisite: Acceptance into Honors Program

This is a survey of the primary topics of psychology including its historical evolution, aims and research methods. Topics include the scientific study of biopsychosocial bases of thought, feelings, and behavior, social determinants, and applications of psychology in various fields of human activity.

The course will include a special honors project.

It also fulfills the social behavioral GUR requirement

This course equates to PSY-101

### **HON 150 - HONORS Introduction to Philosophy (3 cr.)**

Prerequisite: Acceptance into Honors Program

This is a survey of the primary topics of psychology including its historical evolution, aims and research methods. Topics include the scientific study of biopsychosocial bases of thought, feelings, and behavior, social determinants, and applications of psychology in various fields of human activity.

The course will include a special honors project.

It also fulfills the social behavioral GUR requirement.

This course equates to PH 103

### **HON 190 - Special Topics in Honors (3 cr.)**

Prerequisite: Acceptance into Honors Program

The majority of Honors courses are not regular offerings, but special topics courses selected by the honors students themselves. These vary every semester and can be repeated if there is sufficient demand. Past HON 290 topics include Nanotechnology, Astrobiology, Cryptography, Forbidden Knowledge, the Politics and Business of Food, and Understanding Photography.

The course may be repeated for credit if the topic varies.

### **HON 220 - Foundation/Ideas of Natural Science (3 cr.)**

Prerequisite: Acceptance into Honors Program

This course examines the nature of the universe from the standpoint of the natural sciences. It begins with an introduction to the approach used by the natural sciences to study the universe, the scientific method. Five major ideas in the natural sciences: the structure of the atom (physics), the periodic table (chemistry), the big bang theory of the origin of the universe (astronomy), plate tectonics (geology), the structure of DNA (biology), and evolution (biology) are then examined in the context of their historical development and the scientific method. Once these have been discussed, the natural sciences will be contrasted with other fields of human endeavor, comparing the methods used by each with the scientific method. Finally, complex questions from the real world of applied fields will be analyzed and the method of benefit/risk analysis will be introduced.

Offered: in Spring only

This course satisfies the lab science requirement.

### **HON 290 - Special Topics in Honors (3 cr.)**

Prerequisite: Acceptance into Honors Program

The majority of Honors courses are not regular offerings, but special topics courses selected by the honors students themselves. These vary every semester and can be repeated if there is sufficient demand. Past HON 290 topics include Nanotechnology, Astrobiology, Cryptography, Forbidden Knowledge, the Politics and Business of Food, and Understanding Photography.

The course may be repeated for credit if the topic varies.

### **HON 300 - Astrobiology (3 cr.)**

Prerequisite: Acceptance into Honors Program.

This course will examine the definition of life, the origin and early evolution of life on Earth, and the efforts to synthesize life on Earth and discover life elsewhere in the universe. The overriding theme of the course is the unity of all things.

### **HON 301 - The Politics & Business of Food (3 cr.)**

Prerequisite: Acceptance into Honors Program.

This course will offer an overview of many policy controversies surrounding the production, distribution and consumption of food, primarily in the United States, including an examination of problems such as obesity, hunger, food deserts, and environmental damage. This course will study the involvement of government, the private sector, and the citizenry.

### **HON 302 - Science, Skepticism, and Weird Behavior (3 cr.)**

Prerequisite: Acceptance into Honors Program.

### **HON 303 - Love and Hate in Hollywood (3 cr.)**

Prerequisite: Acceptance into Honors Program.

### **HON 333 - Independent Study (3 cr.)**

Prerequisite: Acceptance into Arts and Sciences Honors Program, arrangement with a member of the honors faculty, and approval of the Honors Research Committee.

This faculty-directed research project is a supervised research project intended to allow honors students to explore an area of study in more depth than is possible in regularly offered courses. This course is intended mainly for junior honors students and cannot be taken concurrently with the senior honors project HON 495. Students can only count one faculty-directed research project toward their honors graduation requirements.

See "Independent Study"

### **HON 334 - Independent Study (3 cr.)**

Prerequisite: Acceptance into Arts and Sciences Honors Program, arrangement with a member of the honors faculty, and approval of the Honors Research Committee.

This faculty-directed research project is a supervised research project intended to allow honors students to explore an area of study in more depth than is possible in regularly offered courses. This course is intended mainly for junior honors students and cannot be taken concurrently with the senior honors project HON 495. Students can only count one faculty-directed research project toward their honors graduation requirements.

See "Independent Study"

### **HON 390-395 - Special Topics in Honors (3 cr.)**

Prerequisite: Acceptance into Honors Program

The majority of Honors courses are not regular offerings, but special topics courses selected by the honors students themselves. These vary every semester and can be repeated if there is sufficient demand.

The course may be repeated for credit if the topic varies.

### **HON 495 - Senior Honors Project (3 cr.)**

Prerequisite: Acceptance into Arts and Sciences Honors Program, arrangement with a member of the honors faculty, and approval of the Honors Research Committee.

This course is intended for senior honors students who are preparing their senior honors project under the supervision of a member of the honors faculty in an appropriate field.

## HONB - BUSINESS HONORS PROGRAM

### HONB 190 - Special Topics in Honors Business (1-3 cr.)

Prerequisite: Acceptance into the CoB Honors program

Topics in honors business that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

The course may be repeated for credit if the topic varies.

### HONB 200 - Marketing Concepts (3 cr.)

Prerequisite: Acceptance into the Honors Program or consent of the Business Honors Coordinator.

Cross-Listed as: MK 200

This course examines the marketing functions and analyzes the business environment that affects the development of promotion, pricing, distribution, and product/service/idea areas of the business organization. As the freshmen level honors equivalent of MK 200, the type of work required, pace of study, and opportunities for broader consideration of core course themes distinguish this course. In addition, this course emphasizes critical and independent thinking to produce creative applications of ideas. Key learning outcomes include an ability to analyze and comment on market strategy and tactical development. Such analysis and commentary should address environment influences, changing political, social, demographic, legal and regulatory, technological, and global marketplace environment, and the effects on the planning and execution of ethical and socially responsible marketing strategy and detailed development of the marketing mix.

Offered: While traditionally offered in the spring only, Honors Committee recommended that HONB courses be offered in both semesters due to entering cohort of 30+ students since 2017

Cannot take HONB 200 and MK 200 for credit.

### HONB 201 - Business Law: Principles and Process (3 cr.)

Prerequisite: Acceptance into the Honors Program or consent of the Business Honors Coordinator.

Cross-Listed as: BL 201

This course provides students with an introduction to the legal system and key principles of business law including the State and Federal Court System, torts, negligence, defamation, and contracts. Students will also engage in an in depth examination of legal processes including alternative dispute resolution options, legal research and writing, and preparing for and participating in a business related trial. Students will gain hands-on experience in business law processes through legal simulations, examination of business law case studies and legal research and writing. Key learning outcomes for this course include enhancing students' abilities to communicate the positions of the parties to a legal conflict; differentiate between the boundaries of law, ethics and sound business decision-making; and evaluate and determine the best course of legal action in business management, problem-solving and decision-making.

Offered: While traditionally offered in the spring only, Honors Committee recommended that HONB courses be offered in both semesters due to entering cohort of 30+ students since 2017

Cannot take HONB 201 and BL 201, BL 360 or BL 403 for credit.

### HONB 203 - Financial Accounting: The Language of Business (3 cr.)

Prerequisite: Acceptance into the College of Business Honors Program or consent of the Business Honors Coordinator.

Cross-Listed as: AC 101/AC 201

This course is the introductory financial accounting course for students enrolled in the Business Honors Program in the College of Business. This course exposes students to the basic concepts and issues of financial reporting, including critical analysis of the four primary financial statements. The emphasis is on the interpretation and use of the financial accounting information to make informed decisions. Key outcomes include an understanding of underlying accounting concepts/principles, the accounting information process, the elements of the primary financial statements, and the role of financial accounting in the economy. Cases and financial statements of actual companies are used to stimulate critical and independent thinking, as well as creative application of concepts learned in class.

Offered: in fall only.

Cannot take both HONB 203 and AC 101/AC 201 for credit.

Since HONB 203 is considered a 'bonding' experience for freshmen honors students, this course is restricted for freshmen Business Honors Students

### HONB 204 - Managing People and Processes (3 cr.)

Prerequisite: Acceptance into the College of Business Honors Program or consent of the Business Honors Coordinator.

Cross-Listed as: MAN 204

This course examines the managerial function in organizations and analyzes elements of organizational behavior that impact management practice and leadership.

As the honors equivalent of MAN 204, this course is distinguished by the type of work required, pace of study, and opportunities for broader consideration of core course themes. In addition, this course emphasizes critical and independent thinking to produce creative applications of ideas. Key learning outcomes include an ability to analyze and critique: the role that individual differences and perception play in influencing behavior in organizations; theories and concepts of decision-making and problem solving; theories and concepts of motivation; theories and concepts of leadership; and theories and concepts used in effective teamwork and other organizational processes.

Offered: While traditionally offered in the fall only, Honors Committee recommended that HONB courses be offered in both semesters due to entering cohort of 30+ students since 2017

Cannot take both MAN 204 and HONB 204 for credit.

### HONB 240 - Ethics and Social Responsibility (3 cr.)

Prerequisite: Sophomore standing, acceptance into the Honors Program, or permission of the Business Honors Coordinator.

Cross-Listed as: MAN 240

This course explores the connections between businesses and the wider social environment of which they are a part. Key learning outcomes focus on: recognition of ethical issues with respect to business activities, the basis for government regulation of business and business' involvement in the public policy process, identification and analysis of stakeholder issues, and the nature of corporate social responsibility.

Offered: While traditionally offered in the fall only, Honors Committee recommended that HONB courses be offered in both semesters due to entering cohort of 30+ students since 2017

Cannot take HONB 240 and MAN 240 for credit.

### **HONB 312 - Enterprise Process Integration with SAP (3 cr.)**

Prerequisite: MAN 101/HONB 101 or MAN 204/HONB 204; MK 200/HONB 200; BL 201/BL 360/BL 350/HONB 201; AC 202; BIS 202; BIS 220/BIS 221; FIN 214

Cross-Listed as: BUS 312

The course provides the intermediate integrative framework between BUS 101 and BUS 450. It does so by using SAP to capture the information generated in executing business processes. Students will dive deeper into the topics such as Master data, Business process design, ERP system integration and the value-added, industry specific best practices for processes. Each student will configure a fully functioning business by creating the essential business functions/elements, such as a Chart of accounts, a G/L, credit management, document management, organizational elements for procurement, fulfillment & production, to name a few. Students will create the necessary Master Data. Students will execute business transactions using previously created the org elements and Master data. The course demonstrates integration between functional areas through the configuration and execution of business processes. Using SAP, the student will build upon the introduction to each of the functional areas of business in an integrative manner.

Offered: in spring semester, even years only

### **HONB 390 - Special Topics in Honors Business (1-3 cr.)**

Prerequisite: Acceptance into the CoB Honors program

Topics in honors business that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

The course may be repeated for credit if the topic varies.

### **HONB 450 - Strategic Thinking and Action in Organization (3 cr.)**

Prerequisite: BUS 326 or BUS 312/HONB 312, and BIS 310 or BIS 312, and acceptance into the Honors Program or consent of the Business Honors Coordinator.

Cross-Listed as: BUS 450

This honors strategy course expects students to go beyond a simple understanding of business strategy to more thoroughly examine strategic thought and practice. As such, the course involves a more demanding and rapid-pace than BUS 450 in the examination and application of strategic analysis, planning, implementation, and evaluation undertaken in the development of organizational strategy. Students will critically examine the relationships and influences between environment, organizational structure, and strategy. Key learning outcomes include the application, examination, and evaluation of key elements in the strategic management process - including internal and external strategic analyses, traditional and non-traditional measures of organizational performance - and the basis and relevance of strategic management theories.

Cannot take HONB 450 and BUS 450 for credit.

Cannot be taken concurrently with BUS 326 or BUS 312.

### **HONB 495 - Senior Honors Project (3 cr.)**

Prerequisite: Acceptance into the Honors Program and approval of College of Business Honors Committee.

This course is designed to provide an opportunity to work on an independent research or creative endeavor. Senior student works one-on-one with a faculty mentor who is familiar with the field. The course plays a capstone role in completing the Business Honors Program.

## **HONE - ENGINEERING HONORS PROGRAM**

### **HONE 102 - Engineering Seminar (1 cr)**

Prerequisite: Acceptance to College of Engineering Honors Program

Cross-Listed as: ENGR 102

This seminar course is designed to introduce first- year honors engineering students both to the engineering profession and to the practice of engineering as it relates to their university experience. It enables students to further develop academic and life management skills and to learn how to use University resources.

As the honors equivalent of ENGR 102 the type of work required, and opportunities for broader consideration of core course themes distinguish this course. Students will also gain additional hands-on experience in the practice on engineering through their participation in the complementary ENGR 103 course. Students will be assessed through performance on homework, written reports, and by participation in course activities.

Cannot take HONE 102 and ENGR 102 for credit.

### **HONE 105 - Computer Programming for Engineers (2 cr)**

Prerequisite: Acceptance to College of Engineering Honors Program

Cross-Listed as: ENGR 105

This is an introductory course in the design of software solutions to engineering problems using software capable of being programmed by the user.

As the honors equivalent of ENGR 105, the type of work required, pace of study, and opportunities for more depth and breadth of course themes distinguish this course. Students learn procedural approaches to designing small to medium-scale programs. After successfully completing this course, students understand the issues involved in moving from a general problem statement to a software solution. Students learn a variety of software design solution techniques. They develop skills in logic, algorithm design, and data structure design and debugging. They apply these skills to a variety of engineering, mathematical, and numerical method problem areas. The methods of assessing student learning in the course are homework assignments; weekly quizzes; in-class, project-type programming assignments; and exams.

Cannot take HONE 105 and ENGR 105 for credit.

### **HONE 110 - Data Acquisition and Processing (3 cr)**

Prerequisite: Acceptance to College of Engineering Honors Program

Cross-Listed as: ENGR 110

This is a follow-on course to ENGR103, Introduction to Engineering, to further develop basic skills in engineering and start developing skills in entrepreneurship.

As the honors equivalent of ENGR 110 the type of work required, pace of study, and opportunities for broader considerations of core course themes distinguish this course. In this course you learn about computer-aided data acquisition and processing, as well as, applying what you have learned to date in a product innovation competition. Through a series of laboratory experiences, students will learn the principles necessary to design, implement, and analyze computer-controlled experiments as well as continuing to develop their design skills (both necessary for product design). Industry standard LabVIEW and Arduino are the learning platforms. The methods of assessing student learning in the course are homework assignments, weekly quizzes, laboratory experiments and exams.

Cannot take HONE 110 and ENGR 110 for credit.

### **HONE 190 - Special Topics in HONE (3 crs.)**

Prerequisite: Acceptance to College of Engineering Honors Program

Some of the Honors courses are not regular offerings, but special topics courses selected by the honors students themselves and/or the major department. These vary every semester and can be repeated if there is sufficient demand.

### **HONE 191 - Special Topics in HONE (3 crs.)**

Prerequisite: Acceptance to College of Engineering Honors Program

Some of the Honors courses are not regular offerings, but special topics courses selected by the honors students themselves and/or the major department. These vary every semester and can be repeated if there is sufficient demand.

### **HONE 192 - Special Topics in HONE (3 crs.)**

Prerequisite: Acceptance to College of Engineering Honors Program

Some of the Honors courses are not regular offerings, but special topics courses selected by the honors students themselves and/or the major department. These vary every semester and can be repeated if there is sufficient demand.

### **HONE 193 - Special Topics in HONE (3 crs.)**

Prerequisite: Acceptance to College of Engineering Honors Program

Some of the Honors courses are not regular offerings, but special topics courses selected by the honors students themselves and/or the major department. These vary every semester and can be repeated if there is sufficient demand.

### **HONE 193 - Special Topics in HONE (3 crs.)**

Prerequisite: Acceptance to College of Engineering Honors Program

Some of the Honors courses are not regular offerings, but special topics courses selected by the honors students themselves and/or the major department. These vary every semester and can be repeated if there is sufficient demand.

### **HONE 202 - Mechanics I-Statics (3 cr)**

Prerequisite: Acceptance to College of Engineering Honors Program. Complete MATH 134 with a minimum grade of "C" and PHYS 133  
Cross-Listed as: ME 202

This course is designed to teach problem-solving techniques and to provide students with the necessary background to take succeeding courses in solid mechanics.

As the honors equivalent of ME 202 the type of work required, pace of study and opportunities for broader considerations of course themes distinguish this course.

Cannot take HONE 202 and ME 202 for credit.

### **HONE 205 - Circuits I - Electrical Engineering (4 cr)**

Prerequisite: Acceptance to College of Engineering Honors Program and complete MATH 134 with a minimum grade of "C". Pre- or co-requisite MATH 236 and PHYS 134

Cross-Listed as: EE 205

Students will learn about the static and dynamic behavior of resistors, capacitors, and inductors, the type of electrical energy sources used, the rules used to analyze electrical circuits, to analyze DC and AC circuits for power flow and response characteristics, how to analyze and design op amp circuits used in instrumentation applications, and how to analyze and test Combinational Logic Circuits as applicable to simple industrial and domestic control settings.

As the honors equivalent of EE 205 the type of work required, pace of study and opportunities for broader considerations of course themes distinguish this course.

Three class hours, three lab/tutorial hours.

Cannot take HONE 205 and EE 205 for credit.

### **HONE 240 - Undergraduate Research (1-3 crs.)**

Prerequisite: Acceptance to College of Engineering Honors Program

A limited number of students may undertake supervised research if they show interest in and aptitude for independent and creative work. Approval of the College of Engineering Honors committee is required.

See Undergraduate Research

### **HONE 290 - Special Topics in HONE (3 crs.)**

Prerequisite: Acceptance to College of Engineering Honors Program

Some of the Honors courses are not regular offerings, but special topics courses selected by the honors students themselves and/or the major department. These vary every semester and can be repeated if there is sufficient demand.

**HONE 333 - Independent Study (3 crs.)**

Prerequisite: Acceptance to College of Engineering Honors Program and sophomore standing.

A limited number of students are accorded the opportunity to pursue course work through supervised independent study. Approval of the College of Engineering Honors committee is required.

See "Independent Study"

**HONE 340 - Undergraduate Research (1-3 crs.)**

Prerequisite: Acceptance to College of Engineering Honors Program and junior standing.

A limited number of students may undertake supervised research if they show interest in and aptitude for independent and creative work. Approval of the College of Engineering Honors committee is required.

See Undergraduate Research

**HONE 390 - Special Topics in HONE (3 crs.)**

Prerequisite: Acceptance to College of Engineering Honors Program and junior standing.

Some of the Honors courses are not regular offerings, but special topic courses selected by the honors students themselves and/or the major department. These vary every semester and can be repeated if there is sufficient demand.

**HONE 480 - Internship (3 crs.)**

Prerequisite: Acceptance to College of Engineering Honors Program and junior standing.

Juniors or Senior students may undertake an internship for credit with an approved agency, organization or business. This opportunity furthers a student's knowledge in a specialized area in a way not customarily available within the regular classroom setting. The amount of internship credit that may be counted toward the degree is limited to three (3) credit hours.

See Internship

**HONE 490 - Special Topics in HONE (3 crs.)**

Prerequisite: Acceptance to College of Engineering Honors Program and senior standing.

Some of the Honors courses are not regular offerings, but special topic courses selected by the honors students themselves and/or the major department. These vary every semester and can be repeated if there is sufficient demand.

**HONE 495 - Senior Honors Project (3 crs.)**

Prerequisite: Acceptance to College of Engineering Honors Program and senior standing.

This course is intended for senior honors students who are preparing their senior honors project under the supervision of a member of the faculty of the appropriate engineering major.

**HONU - HONORS UNIVERSITY****HONU 190 - 192 - Special Topics in Honors (1 - 3 cr.)**

Prerequisite: Acceptance into COAS, COB, or COE Honors Program

The majority of Honors courses are not regular offerings, but special topics courses selected by the honors students themselves. These vary every semester and can be repeated if there is sufficient demand.

The course may be repeated for credit if the topic varies.

**HONU 390 - 392 - Special Topics in Honors (1 - 3 cr.)**

Prerequisite: Acceptance into COAS, COB, or COE Honors Program. Sophomore Standing.

The majority of Honors courses are not regular offerings, but special topics courses selected by the honors students themselves. These vary every semester and can be repeated if there is sufficient demand.

The course may be repeated for credit if the topic varies.

**HRM - HUMAN RESOURCE MANAGEMENT****HRM 322 - Managing a Diverse Workforce (3 cr.)**

Prerequisite: MAN 204/HONB 204, or PSY 101, or SO 101

Cross-Listed as: MAN 322

As the labor force becomes increasingly diverse, a strong emphasis is being placed on diversity-related issues of all kinds in the workplace. Diversity in the workplace may result from differences in individual characteristics such as gender, race, ethnicity, national origin, age, religion, and physical ability/disability. Organizations need to address diversity issues in some manner if they are to compete effectively in a global economy. But what should an organization actually do about increased diversity in the workplace other than watch it happen? To address this question, this course examines issues related to managing and being a member of an increasingly diverse workforce. Learning how to deal with these issues in a manner that preserves the integrity and takes advantage of the contributions of all members of the workforce, regardless of their personal characteristics and group memberships, is encouraged.

Distribution: MR

Offered: in spring

HRM 322 is equivalent to MAN 322

**HRM 323 - Human Resource Management (3 cr.)**

Prerequisite: MAN 101/HONB 101 or MAN 204/HONB 204 or PSY 101

Cross-Listed as: MAN 323

The course provides an overview of human resource management practices in organizations. Focus on key learning outcomes includes the understanding, application, and problem-solving associated with: the strategic role of human resource management; legal issues of HRM including selection and compensation; principles of effective employee selection; various approaches to employee training; setting and administration of compensation; pay for performance systems; approaches to performance appraisal; workplace health and safety; value of job description and building motivation into the job design. Course includes career readiness element.

Distribution: MR

Offered: in fall and spring.

HRM 323 is equivalent to MAN 323

### **HRM 324 - Performance Management (3 cr.)**

Prerequisite: MAN 204/HONB 204, or PSY 101 and HRM 201

Cross-Listed as: MAN 324

This course takes an in-depth look at the theoretical and practical role of performance management in organizations. Students will learn how the strategic use of the performance management process can improve overall organization performance. Students will learn to: measure and monitor performance; diagnose performance deficiencies; utilizing mentoring and coaching; setting goals and objectives for performance improvement; developing and implementing performance improvement activities including training; and, developing performance improvement plans at the individual and organizational level.

Distribution: MR

Offered: in spring.

HRM 324 is equivalent to MAN 324

### **HRM 328 - Human Resources Analytics (3 cr.)**

Prerequisite: MAN 204/HONB 204, and HRM 201, and BIS 221

Cross-Listed as: MAN 328

The course offers students opportunities to apply analytical methods to enhance people-related decision-making in organizations. Students will use Human Resource (HR) data to evaluate critical HR Management questions and issues such as workforce planning, legal compliance, recruiting, hiring and promotion, performance management, training, job design, compensation, and career planning. Students will learn to solve organization HR challenges using analytics, identify advantages and disadvantages of analytic options, evaluate scholarly reports and studies, use key analytic tools, understand how to gather, track, store, retrieve, organize, analyze, interpret, and present HR data that leads to actionable business decisions.

Distribution: MR

Offered: in fall, odd years

HRM 328 is equivalent to MAN 328

### **HRM 333 - Independent Study in Human Resource Management (3 cr.)**

See "Independent Study".

### **HRM 334 - Independent Study in Human Resource Management (3 cr.)**

See "Independent Study".

### **HRM 390 - Special Topics in Human Resource Management (3 cr.)**

This is a study of advanced topics in human resource management of special interest to human resource management majors, but not offered on a regular basis.

### **HRM 436 - Compensation and Benefits (3 cr.)**

Prerequisite: HRM 323

Cross-Listed as: MAN 436

The course takes an in-depth look at the role of compensation and benefits in an organizations strategic plan to recruit, motivate and retain qualified employees in union and non-union environments. Key learning outcomes include the understanding, application, and problem-solving associated with: the design and methodology of wage and salary administration; job evaluation; salary structure; use of wage incentive systems; international compensation; health insurance administration; health and wellness programs; retirement and savings plans; other compensation and benefits options; and evaluating effectiveness of compensation and benefits programs.

Distribution: MR

Offered: in fall.

HRM 436 is equivalent to MAN 436

### **HRM 466 - Senior Seminar in Human Resource Management (3 cr.)**

Prerequisite: HRM 328; BL 424; HRM 436; and Senior HR Management major standing only

The course provides students with an opportunity to integrate their HRM knowledge and skills. Key learning outcomes focus on using data to identify and address organizational problems and opportunities, understand how to manage change, application of employment law, labor law and compliance to an organizational situation, application of HRM theories to an organizational problem or opportunities, and refine skills as a strategic business partner. Course includes career readiness element.

Distribution: MR

Offered: in spring.

### **HRM 480 - Internship in Human Resource Management (1-3 cr.)**

See "Internships".

Distribution: MR

### **HRM 481 - Internship in Human Resource Management (1-3 cr.)**

See "Internships".

## **HS - HEALTH SCIENCES**

### **HS 210 - Nutrition (3 cr.)**

Prerequisite: BIO 107 and BIO 117

This course will introduce students to the science of nutrition as it relates to individual food choices, health behaviors, and overall health. Application topics include wellness, obesity, eating disorders, sports nutrition, and diet-related disease. Nutrients and nutrient needs will be addressed using a functional approach. This course is intended for students entering health related fields and those with a general interest in nutrition.

Distribution: MR

BIO 107 and BIO 117, followed by this course, would meet the General University Requirements for the Natural Science Perspective (NSP).

### **HS 215 - Introduction to GIS (3 cr.)**

Prerequisite: Sophomore standing

Geographic Information Science (GIS) is a relatively new discipline that allows individuals to manage, analyze, and visualize information related to geographical locations in a simple format. GIS has many applications in the health care sector, particularly regarding medical and epidemiological research. For example, this tool is used to track sources of diseases and movements of contagions, to conduct health care policy research, and to track child immunizations. In this class, students will analyze health-care related data sets and learn about the versatile applications of GIS in the health care sector.

Distribution: MR

Two class hours, three hour lab.

Formerly ILP 243

\$100

### **HS 290 - Special Topics in Health Sciences (3-4 cr.)**

Prerequisite: Sophomore standing.

Topics in health sciences that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies

Distribution: MR

### **HS 291 - Special Topics in Health Sciences (3-4 cr.)**

Prerequisite: Sophomore standing.

Topics in health sciences that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies

Distribution: MR

### **HS 310 - Environmental Influences on Human Health (3 cr.)**

Prerequisite: BIO 108, CHEM 106, BIO 216 or permission of instructor.

This course offers an introductory investigation of the human health impacts of various chemical, biological, physical, and social factors in the environment. Topics include, among others, the health effects of air and water pollutants, toxic wastes, pesticides, disease organisms present in food and water, noise, radiation, climate, and socioeconomic status. The scientific methods for determining these effects are examined.

Distribution: MR

### **HS 315 - Protein Folding, Misfolding & Disease (3 cr.)**

Prerequisite: BIO 108, CHEM 106, and Junior Standing, or permission of instructor.

This course covers the effects of the alteration of the folded protein structure as a consequence of environmental stress, genetic mutation, and/or infection. Misfolded proteins can stick together and fall out of solution in a process known as aggregation. In many protein aggregation diseases, misfolded proteins self-associate, forming fiber-like aggregates that cause brain cell death and dementia. The molecular and biochemical basis of the prion diseases, which include bovine spongiform encephalopathy (mad cow disease), Creutzfeldt-Jakob disease and kuru will be examined. Other classes of misfolding diseases such as Alzheimer's disease, Parkinson's disease, Cystic Fibrosis, and cancer will be discussed including possible detection methods and therapies.

Distribution: MR

### **HS 320 - Regeneration (3 cr.)**

Prerequisite: BIO 216 or BIO 310

The ability of organisms to repair and replace tissues and body parts has long been an intriguing puzzle. This course will focus on regeneration in mammals and will discuss progress in regenerative medicine for selected organ systems. An oral presentation and a review paper on a topic of interest is required.

Distribution: MR

### **HS 321 - Evolutionary Medicine (3 cr.)**

Prerequisite: BIO 216 or permission of instructor

This course is designed to be a comprehensive introduction to evolutionary, or Darwinian, medicine. In brief, evolutionary medicine is the application of evolutionary thinking, including evolutionary processes and human evolutionary history, to understanding health and disease among contemporary human populations. This course uses a scientific approach, drawing on the methods, theories, and bodies of knowledge from various scientific disciplines, including evolutionary biology, genetics, neuroscience, physiology, nutritional sciences, and medicine.

Distribution: MR

### **HS 322 - Immunology (3 cr.)**

Prerequisite: BIO 107 and CHEM 209

Immunology is the study of the physiological mechanisms that humans and other animals use to defend their bodies from invasion by other organisms. In this course, students will be introduced to the three lines of defense utilized by humans to ward off infections. They will also learn about how improper functioning of the immune system can result in diseases like autoimmunity, allergies, and cancer.

### **HS 325 - Epidemiology (3 cr.)**

Prerequisite: BIO 108, MATH 120 or MATH 121, & Junior Standing. BIO 215 & BIO 216 recommended.

This course offers an introduction to the principles and methods of epidemiology. Epidemiology is the study of the distribution and determinants of disease and other health-related events at the population level. Topics include epidemiologic methods (e.g., study design, measures of disease distribution and association, interpretation), and the application of research findings to disease prevention and control strategies.

Distribution: MR

### **HS 333 - Independent Study in Health Sciences (1-3 cr.)**

See "Independent Study"

Distribution: MR

A lab fee may be required.

### **HS 334 - Independent Study in Health Sciences (1-3 cr.)**

See "Independent Study"

Distribution: MR

A lab fee may be required.

### **HS 390 - Special Topics in Health Sciences (3-4 cr.)**

Prerequisite: Junior standing.



Topics in health sciences that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies

Distribution: MR

### **HS 391 - Special Topics in Health Sciences (3-4 cr.)**

Prerequisite: Junior standing.

Topics in health sciences that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies

Distribution: MR

### **HS 412 - Cancer Biology (3 cr.)**

Prerequisite: BIO 306, or permission of instructor.

This course provides an overview of the fundamentals of cancer biology and cancer treatment. Intended for junior and senior students majoring in health sciences or biology. Topics include cancer as a genetic disease, oncogenes, familial cancer, signal transduction, cell cycle control, apoptosis, cancer metabolism, metastasis, and conventional and molecularly-targeted therapies.

Distribution: MR

Formerly HS 312

### **HS 440 - Undergraduate Research in Health Sciences (1-3 cr.)**

Prerequisite: At least Senior standing.

See "Undergraduate Research".

Distribution: MR

A lab fee may be required.

### **HS 441 - Undergraduate Research in Health Sciences (1-3 cr.)**

Prerequisite: HS 440

See "Undergraduate Research".

This course is a continuation of HS 440.

Distribution: MR

A lab fee may be required.

### **HS 470 - Seminar in Health Sciences (1 cr.)**

Prerequisite: BIO 306 or permission or instructor

This seminar is intended as a capstone experience for health sciences majors. Students will read, discuss, and present articles from the primary literature related to a particular theme in health science.

Distribution: MR

A lab fee may be required.

### **HS 480 - Internship in Health Sciences (3 cr.)**

See Internships

Distribution: MR

### **HS 481 - Internship in Health Sciences (3 cr.)**

See Internships

Distribution: MR

### **HS 490 - Special Topics in Health Science (1-3 cr.)**

Members of the health science faculty offer selected topics in their areas of specialty. These courses are not offered on a regular basis and may be repeated for credit if the topic differ

Laboratory fees may be required.

## **IE - INDUSTRIAL ENGINEERING**

### **IE 212 - Probability and Statistics (3 cr.)**

Prerequisite: MATH 134 or concurrently.

This is a basic study of probability and statistical theory with emphasis on engineering applications. Students become knowledgeable of the collection, processing, analysis, and interpretation of numerical data. They learn the basic concepts of probability theory and statistical inference, and become aware of techniques of statistical design.

Distribution: ER/MR

### **IE 302 - Human Factors in Design Engineering (3 cr.)**

Prerequisite: ENGR 110/HONE 110 and IE 212

This course offers an introduction to the design of systems to fit the human user for the purpose of improving user efficiency, safety, decision-making, safety, and job satisfaction. Topics include both physical and cognitive aspects of human factors engineering. Course will include opportunities for hands on data-collection and an experiment- focused student project.

Distribution: MR

Formerly Human Factors in Design

### **IE 308 - Work Analysis and Design (3 cr.)**

Prerequisite: IE 212.

This is a study of past approaches and current trends in designing effective and efficient work systems. Included are investigation and practice of the creative process, design and development procedures, implementation, and problem solving. A major design and problem-solving project is required.

Distribution: MR

### **IE 312 - Engineering Economic Analysis (3 cr.)**

Prerequisite: IE 212 or

Corequisite: IE 212

This course examines the economic aspects of engineering projects. Topics include the time value of money, basic economic principles, and the effect of financing, depreciation, and taxes on capital investments. Emphasis is on quantifying the economic impacts of

engineering projects, and identifying and selecting the most economically attractive project from a menu of alternatives.

Distribution: MR

### **IE 314 - Manufacturing Processes (3 cr.)**

Prerequisite: ME 309

Cross-Listed as: ME 322

This is a study of various methods of manufacturing. Areas studied include stages of product processing, equipment determination and justification, tooling metrology, as well as estimating design-to-product cost.

Distribution: MR

IE 314 is equivalent to ME 322

### **IE 315 - Quality Control and Engineering Statistics (3 cr.)**

Prerequisite: IE 212

This course studies statistical techniques used in analyzing experimental results and quality control. Topics include data analysis, regression, design of experiments, statistical process control, control charts, and process capability analysis.

Distribution: MR

### **IE 318 - Mathematical Programming for Engineers (3 cr.)**

Prerequisite: IE 212

This course will be an introduction to mathematical programming, with an emphasis on techniques for the solution and analysis of deterministic linear models. The primary type of model to be addressed is linear programming. The main emphasis will be on mathematical modeling of problems common to industrial engineers. This course will also emphasize effective modeling techniques, solutions methods such as the simplex and revised simplex methods.

Additionally, the course will introduce effective modeling techniques and commercial solvers such as MS Excel/Solver, LINGO, and CPLEX.

Distribution: MR

Formerly Industrial Design Laboratory I

credit change in Fall'22 to 3 crs.

### **IE 326 - Production Planning and Control (3 cr.)**

Prerequisite: IE 212

This is an introduction to quantitative production management. Topics include inventory control, production planning, master production scheduling, capacity planning, and techniques for shop floor control. The relationships between a company's manufacturing, marketing, and financial functions are included.

Distribution: MR

### **IE 328 - Lean Six-Sigma for Engineers (3 cr.)**

Prerequisite: IE 212

This course will introduce the students to both the theory and application of contemporary quality improvement techniques. The course will cover Six Sigma methodology, and problem-solving tools to improve cost, quality, time and variability. The main emphasis will be on process improvement tools and methodologies and the integral elements of a total quality management for both manufacturing and service organizations. Additionally, the course will discuss approaches for designing quality into products and processes.

Distribution: MR

One class hour, three-hour lab.

Formerly Industrial Design Laboratory II

credit change in Fall'22 to 3 crs.

### **IE 330 - Manufacturing & Production Lab (2 cr.)**

Prerequisite: IE 314 or ME 322; or concurrently

This course will introduce engineering students to core fundamental concepts in the design, implementation and assessment of automation systems utilized in industrial and manufacturing work environments. Students will finish the course with a foundational understanding and a hand-on knowledge of the key automation technologies used in controlling operations in manufacturing. Topics will include machining processes, injection molding processes, additive manufacturing processes, programmable logic controls, and robotics.

Distribution: MR

### **IE 334 - Computer Simulation and Design (3 cr.)**

Prerequisite: ENGR 105/HONE 105, and IE 212

This is a study of discrete-event simulation and its use in the analysis and design of systems. The focus is on the analysis of manufacturing systems such as assembly lines, material handling systems, and production processes. Students write programs using traditional programming languages and simulation software.

Distribution: MR

### **IE 335 - Independent Study in Industrial Engineering (3 cr.)**

See "Independent Study"

Distribution: MR

### **IE 410 - Engineering Project Management (3 cr.)**

Prerequisite: Junior or senior standing.

Corequisite: for IE students: IE 439.

This course studies the use of conceptual, analytical, and systems approaches in managing engineering projects and activities. Major topics are development and writing project plans including project proposals, project scopes, work breakdown structures, network diagrams, project schedules, and presentations. Other topics include the people side of engineering and project management, communication, and documentation. An industrial project is required.

**IE 419 - Python Programming and Machine Learning for Industrial Management (3 cr.)**

Prerequisite: ENGR 110/HONE 110,

Corequisite: IE 212

This is the study of contemporary computer tools toward industrial engineering. Students design, develop, and deploy client and web based applications including user interface and database backend. These applications are developed for inventory and production control systems, statistical applications, and database/data mining applications. Software tools and packages utilized include: VBA, HTML, CSS, PHP, MySQL and MS Access.

formerly Industrial Engineering Computer Applications

**IE 420 - Industrial Engineering Operations Research (3 cr.)**

Prerequisite: IE 212, MATH 235.

This operations research course covers more advanced topics in operations research. The course focuses on the fundamentals of model formations for mathematical programming. Topics include but not limited to parametric linear programming, transportation and assignment problems, network optimization, dynamic programming, integer programming, heuristic methods, and the introduction to non-linear programming. Applications of the introduced topics will be discussed using real case studies.

Distribution: MR

Formerly "Contemporary Issues In Operations Research"

**IE 422 - Industrial Safety and Hygiene (3 cr.)**

Prerequisite: ENGR 212 or IE 212.

This is a study of issues related to human interaction(s) within a workplace. The focus is on industrial safety and hygiene in workplace design. Other topics include: the principles of industrial hazard avoidance and the roles of NIOSH and its relationship with OSHA.

This course is a prerequisite.

**IE 424 - Computer Integrated Manufacturing (3 cr.)**

Prerequisite: ME 322.

This is a study in the issues related to computer-integrated manufacturing and the integration of automated processes within a modern manufacturing environment. The focus is on engineering design, modeling and applications in automation, flow lines, robotics, numerical control, and computer usage in manufacturing.

**IE 426 - Production Design (3 cr.)**

Prerequisite: IE 326 or permission of the instructor.

This course studies advanced topics in production planning and control, operational modeling, and network scheduling. A design project is required.

**IE 428 - Facility Design & Material Handling (2 cr.)**

Prerequisite: IE 212 and IE 318

This course will provide students with the fundamental concepts, theory and procedures for the study of facilities design and location; physical layout; material flow principles; and material handling. The course will discuss product design, process planning and schedule design in the development of analytical procedures for facility design

and material handling. Additionally, students will use software to supplement the decision-making process in the design, rationalization and improvement of factory and office layouts.

Distribution: MR

One class hour, three-hour lab.

Formerly Industrial Design Laboratory III

**IE 429 - Design and Analysis of Experiments (3 cr.)**

Prerequisite: IE 212 or equivalent.

This course deals with the design of experiments, the application of analysis of variance, regression analysis, and related statistical methods. The goals are to learn how to plan, design, and conduct experiments efficiently and effectively and learn how to analyze the resulting data to obtain objective conclusions. Experimental design and analysis are investigated.

Distribution: MR

**IE 439 - Senior Design Projects I (3 cr.)**

Corequisite: Graduating senior status.

Project management material covered in IE 410 is applied to business and industry problems. Each student develops a complete senior project plan in an industrial setting, obtains approval by a faculty and industrial project advisor, and makes an oral presentation of the proposal to the faculty. Guest lecturers relating to patents, technical writing, ethics, engineering registration, and other professional concerns are included.

Distribution: MR

**IE 440 - Senior Design Projects II (3 cr.)**

Prerequisite: IE 439.

The student works on an independent engineering project under the supervision of a project advisor. The design process is emphasized. Progress reports and a final written report are submitted to the student's project advisor. Oral presentations of reports are made before the faculty and students. A student who selects a project suggested by industry has the opportunity of working with an industrial sponsor in an actual engineering experience.

Distribution: MR

**IE 460 - Supply Chain Engineering (3 cr.)**

Prerequisite: IE 212, Junior or Senior standing.

This course introduces the student to the strategic role of supply chain engineering. The success and prosperity of businesses greatly depend on the effective supply chain and resilience in solving supply chain issues. By the end of the course the student will have the skills to formulate an effective supply chain model, evaluate supply chain performance, and apply the relevant analytical tools.

Distribution: MR

**IE 480 - Internship in Industrial Engineering (3 cr.)**

See "Internships".

**IE 482 - Industrial Engineering Research (1-3 cr.)**

Prerequisite: Junior or Senior Standing.

See "Undergraduate Research" in catalogue.

Distribution: MR

Variable credits 1-3 cr.

**IE 490 - Special Topics in Industrial Engineering (3 cr.)**

This is a study of an advanced topic in engineering of special interest to industrial engineering majors, but not offered on a regular basis.

**ILP - INTEGRATED LIBERAL AND PROFESSIONAL****ILP 190 - Special Topics in Integrated Liberal and Professional (3 cr.)**

Topics of this course vary from year to year depending on faculty and student interests. This course may be repeated if topic differs.

**ILP 212 - American Art and American Culture (3 cr.)**

Cross-Listed as: ART 205

American art both reflects and influences the culture in which it is created. This course will provide students with the opportunity to explore the evolution of major American art movements, styles, and artistic elements from the 18th century to the present and their connections to the cultural ideas of the time. Iconic works of American painting, sculpture, photography and architecture will be visually read and discussed. Selected readings, and a museum visit will supplement the visual analysis to highlight the connection between the art and the cultural context of the period. The class will include visual analysis techniques to look at and discuss a work of art using standard art terminology. Students will have the opportunity to investigate in-depth either a work of art or an artist as representative of an American art movement of their choice.

**ILP 215 - The Music-Making Mind (3 cr.)**

Prerequisite: Sophomore standing

This course will cover the theories and practices of how we learn and teach presentational and participatory music. Topics will include a comparison of different methods for teaching and learning music as well as the history and perception of emotion in music. Students will review the recent research on cognition of performing and listening to music and discuss how the music-making mind can and should be studied.

**ILP 220 - Work and Career (3 cr.)**

Prerequisite: Sophomore Standing

This course examines liberal and professional perspectives on work and career, with opportunities for students to explore the meaning and practical implications that these terms have for them individually. Students will engage in activities designed for career exploration, build a public portfolio that represents elements of this process, and develop a plan for their remaining academic journey. Key learning outcomes include: historical differences in the meaning of work and career, social problems related to work and careers, career development strategies, and contemporary organizational approaches to employee career development.

**ILP 221 - Sounds & Symbols (3 cr.)**

This course will examine the relationship between language and music across time as basic forms of human communication. as well as how that has impacted music history. It also will look at professions for which the relationship between music and language is particularly central, such as music composition and music criticism.

**ILP 224 - Experience Italy (3 cr.)**

Prerequisite: Sophomore standing

This Integrated Liberal and Professional Perspectives course, ILP 224 "Covering Italy," is designed for students to participate in international travel. This course focuses on the process and techniques of becoming better writers, speakers, and photographers through the perspective of a journalist to report on the Italian culture, media outlets, and its people.

This particular class will spend three-weeks during the summer at WNE's partner institution, Sant' Anna Institute, in Sorrento, Italy, and students will document their experiences through writing assignments and presentations.

**ILP 225 - Gender and Work (3 cr.)**

Students are introduced to sociological and managerial perspectives on gender and work, including a consideration of standards for social research and its usefulness in a managerial setting. The focus of the course is on an analysis of the quality of social research and on its relevance and application in managerial settings.

**ILP 235 - Global Sustainability Management (3 cr.)**

Prerequisite: Sophomore standing and permission of instructor.

This travel/study course explores the impact of organizational activities on sustainability through trips of one-to-three week's duration during school breaks that are chaperoned and supervised by a faculty member. These trips take students outside the geographic borders of the U.S. and provide learning experiences beyond the classroom environment. The course involves research and discussion of environmental issues relevant to the country being visited, and programs and activities that enhance the ability of students to comprehend, analyze, and grasp different aspects of sustainability that are the responsibility of organizations in the global environment. The major goal of the course is to allow undergraduate students opportunities to understand the relationship between the science of environmental sustainability and the efforts of organizations to support environmental responsibility. The course may be repeated for credit if the location/topic varies.

**ILP 238 - Global Health and Technology (3 cr.)**

This course provides a multidisciplinary study of the intersection between global health issues and the technologies being developed to resolve them. Major questions that will be addressed during the course include: (1) What are the major health problems facing the world today? (2) Who pays for healthcare and how does this vary regionally? (3) How can technology be used to solve global health issues? The course content and assignments reflect the integrated

liberal and professional approach to learning through graphical analysis of biomedical data, examination of cultural and economic issues, and both written and oral communications regarding the social implications of technology development.

At the conclusion of the course, students embark on a faculty-led trip to Guatemala, where they investigate healthcare in the region.

### **ILP 252 - Based on a True Story: Films That Inspire (3 cr.)**

Prerequisite: Sophomore standing.

This course combines social work professional knowledge, values, and skills that relate to community organization and the promotion of social justice with psychological and sociological explanations of why some people choose to act in the face of oppression, while others become bystanders, victims, or collaborate with the aggressor. The course will be taught using films based on true stories of people who took action to combat oppression.

### **ILP 253 - Justice Then and Now (3 cr.)**

Prerequisite: Sophomore standing.

This course will consider the development of the Hellenistic world, the growth of the Roman Republic, the transition to the Principate, and then the Dominate. Lectures and readings will survey Roman Literature, Philosophy, Law, Religion, and the rise of Christianity. Attention will be given specifically to the Roman practice of criminal law and procedure-apprehension, trial, and punishment-comparing this practice to that of England in the 18th century and America of today.

Formerly CUL 251.

### **ILP 290-294 - Special Topics in Integrated Liberal and Professional (3 cr.)**

Prerequisite: Junior standing.

Topics of this course vary from year to year depending on faculty and student interests. This course may be repeated if topic differs.

### **ILP 310 - Political Polling (3 cr.)**

Prerequisite: Junior or Senior standing.

Polling is a central part of political campaigns. Candidates use public opinion data to shape their message, their campaign ads and sometimes issue positions. This course draws from political science, survey research, and psychology to examine how pollsters measure voters' perceptions of candidates and issues, and how candidates use polling data to adjust their message and strategy in the heat of a campaign. The course also examines the psychology behind the formation of political attitudes and how best to measure those attitudes in a dynamic campaign environment.

Students receive hands-on experience in polling through the Western New England University Polling Institute.

### **ILP 314 - Textiles Through Time (3 cr.)**

Prerequisite: Junior standing.

This course will examine the history, sociology, aesthetics, economics, and inventions related to textiles. We will move through

time looking at the change in choice of textile production from natural fibers to manufactured fibers exploring what drove these changes and the applications of various textiles as they became available.

### **ILP 320 - The Moving Image (3 cr.)**

Prerequisite: Sophomore standing.

This course provides an introduction to the skills necessary when writing for the media in various forms-non-fiction, speech-writing, broadcast and print journalism, and film documentaries. Students will do research and preparation to enable them to create their own media products, considering how their ideas can be translated creatively into effective sound and moving images, into something functional in the everyday world. They will also learn to transform the purely functional into a product with satisfying aesthetic, educational, and ethical dimensions.

### **ILP 353 - Leadership and Team Skills (3 cr.)**

Prerequisite: Junior/senior standing.

Cross-Listed as: MAN 353

This course provides the opportunity to examine leadership issues from historical, sociological, and psychological perspectives, and to practice leadership and group skills within the classroom. Readings from historical biographies, sociology, and psychology will be used to gain insights into a range of leadership qualities and abilities. Students will also take a number of assessment instruments that will help them determine their own leadership profiles and will guide them in refining their skills during the semester. Students will be assigned to a specific small group that will perform an array of activities and serve as the context for personal skill building. Students will learn how to analyze a variety of leadership functions and develop a reflective practice that will enable them to continue to perfect their leadership skills in the future.

### **ILP 365 - Emergence of Modern Marketing (3 cr.)**

Prerequisite: Junior standing.

The purpose of this course is to introduce students to the emergence of modern marketing through "characteristics of persistent, systematic, and increasingly widespread marketing methods adopted by businesses from the nineteenth century onwards." Issues investigated include selling, advertising, branding, pricing, promotion, market research, and product planning and development. A case-based approach to the investigation of the history and context behind these pivotal moments in marketing and marketing practice is the basis for instruction in this course.

### **ILP 367 - Baseball and American Culture: The Evolution of a Pastime (3 cr.)**

Prerequisite: Sophomore standing.

This course seeks to explore the various relationships between baseball and American culture, focusing on the role of business and baseball; the way in which baseball has been used to define boundaries for American identity, particularly along the lines of race, gender, and ethnicity; the uses to which baseball has been put within different art forms, including fictional literature, poetry, music, theater, and film; and how baseball has played a significant role in the creation and maintenance of print and broadcast media institutions.

### **ILP 369 - Problem Solving Through Design (3 cr.)**

Prerequisite: Junior or senior standing.

This course is intended for all majors. The course will focus on systematic approaches to problem-solving through design. Design is the process to achieve desired transformation from the current state to an improved state. Everyone does this, whether it is a simple activity or finding the solution to a complex problem. Students will gain understanding of defining criteria and restrictions that influence designs and how designs influence culture and society.

### **ILP 370 - Human Genome Project (3 cr.)**

Prerequisite: Junior or senior standing.

This 300-level course is targeted at both non-science and science majors intrigued by the potential this new research has for affecting their lives, and the lives of their friends and family, particularly regarding health issues. The current learning objectives for this course include, but are not limited to: (1) a basic understanding of how genetics works; (2) a basic understanding of the history of the HGP; (3) an understanding of some of the potential benefits of new genetic and reproductive technologies; (4) an understanding of the inherent conflicts associated with new genetic technologies and the ethical issues associated with these conflicts, for example, concerns about access—who is denied benefits, who gains the benefits; and (5) an understanding of the civil responsibility in guiding both the research and its ultimate applications. Students will be introduced to the history and motivation for the project, the fundamentals of genomics, and applications of the HGP. The second part focuses on the ethical, legal, and social implications (ELSI) of the research.

### **ILP 375 - Exploring Public Opinion (3 cr.)**

Prerequisite: Junior/senior standing.

In this course, students will learn the basics of public opinion polling within the broader context of rhetoric and the "public sphere." Readings in rhetoric and culture criticism will frame the work that students do in constructing surveys, selecting samples, and conducting public opinion polls for clients on and/or off-campus. Practical and theoretical perspectives will be employed.

### **ILP 390-399 - Special Topics in Integrated Liberal and Professional (3 cr.)**

Prerequisite: Junior standing.

Cross-Listed as: PSY 388

Topics of this course vary from year to year depending on faculty and student interests. This course may be repeated if topic differs.

## **ILSP - INTEGRATED LIBERAL STUDIES PROGRAM**

### **ILSP 480 - Internship (1-3 cr.)**

Internship experiences typically occur within the context of major or minor academic disciplines. From time to time, however, there are opportunities that fall outside the confines of the major, but yet provides career experience.

### **ILSP 481 - Internship (1-3 cr.)**

Internship experiences typically occur within the context of major or minor academic disciplines. From time to time, however, there are opportunities that fall outside the confines of the major, but yet provides career experience.

## **INST - INTERNATIONAL STUDIES**

### **INST 100 - Global Intercultural Orientation (2 cr.)**

This course is designed for students who are preparing to study and/or work abroad. Studying abroad is a unique opportunity that more and more students are taking advantage of in an effort to become more worldly, improve their employment prospects after graduation, and to gain a better understanding of different political and economic systems, dissimilar cultures, histories, and norms, divergent religious beliefs and practices, as well as the diversity of languages that are spoken in our increasingly globalized world. The ultimate goal of this course is for students to be better prepared for what they will experience when they travel abroad in order that they can make the most of their overseas travels and experiences.

Distribution: MR

### **INST 101 - Introduction to Contemporary Global Issues (3 cr.)**

Cross-Listed as: POSC 101

The course examines numerous social, cultural, economic, and political issue areas from the vantage points of global community and global citizenship. Areas such as the regulation of business, the spread of technology, environmental pollution, health, poverty, crime, human rights, immigration, education, and democracy as well as war and peace, are analyzed within the context of globalization.

Distribution: MR

This course is a prerequisite.

### **INST 190 - Special Topics in International Studies (1-3 cr.)**

Topics in international studies that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **INST 290 - Special Topics in International Studies (1-3 cr.)**

Topics in international studies that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **INST 480 - Internship in International Studies (1-3 cr.)**

See "Internships".

Distribution: MR

### **INST 481 - Internship in International Studies (1-3 cr.)**

See "Internships".

Distribution: MR

### **INST 490 - Seminar in International Studies (3 cr.)**

Prerequisite: Senior standing and 15 credit hours of international studies or permission of the instructor.

This is an exploration of selected topics in international studies with an emphasis on developing research analytical skills. These skills are incorporated into a research project on a topic selected by the student. This course may be repeated if the topic differs. All senior international studies majors are required to enroll in this course.

Distribution: MR

**INTB - INTERNATIONAL BUSINESS****INTB 251 - Introduction to International Business (3 cr.)**

This course serves as an introduction to the vocabulary and concepts of international business and to the challenges that face business firms conducting activities across national borders. Key learning outcomes include: international business terms and concepts, cultural variables that affect business practices, different types of economic, political and legal systems and their impact on business, and the financial and regulatory frameworks of international commerce.

Offered: in spring of odd years

**INTB 333 - Independent Study in International Business (3 cr.)**

See "Independent Study".

**INTB 334 - Independent Study in International Business (3 cr.)**

See "Independent Study".

**INTB 465 - Seminar in International Business (3 cr.)**

Prerequisite: Senior Standing and International Business Major.

The course examines contemporary issues in international business. Key learning outcomes focus on current events and issues in the international domain, and to the integration of international business concepts and theories for addressing them. Strategies for international business career determination and implementation are emphasized.

Distribution: MR

Offered: in spring.

**INTB 480 - Internship in International Business (3 cr.)**

Prerequisite: Must have completed at least 57 credit hours (Junior Standing) and a minimum GPA of 2.5 overall and in the major, except where an internship is required in the major, or obtain special permission of their dean to undertake an internship.

See "Internships".

Distribution: MR

**INTB 481 - Internship in International Business (1-3 cr.)**

Prerequisite: Must have completed at least 57 credit hours (Junior Standing) and a minimum GPA of 2.5 overall and in the major, except where an internship is required in the major, or obtain special permission of their dean to undertake an internship.

See "Internships".

Distribution: MR

**IT - INFORMATION TECHNOLOGY****IT 101 - Introduction to Computing (4 cr.)**

Cross-Listed as: CS 101

This course is designed to introduce the student to various fields of computing in order to help them make an informed choice about which career path they would like to pursue. Topics include data representation, hardware, system and application software, communications and the systems development life cycle. Comparison

of the computer science and information technology fields will be ongoing throughout the course.

Distribution: GUR/MR

Offered: in the fall semester.

3 hours of lecture and 3 hours of lab per week.

This course is a prerequisite.

Laboratory fees \$50.

**IT 102 - Introduction to Programming (4 cr.)**

Cross-Listed as: CS 102

Covers problem solving with programming. Students learn to apply fundamental imperative, procedural constructs to solve common programming problems, as well as the beginnings of object oriented programming (e.g., defining classes, instantiating objects, using objects, and using application programmer's interfaces). Students learn to design and develop small programs using a procedural, imperative programming language and appropriate analysis, design, and testing techniques.

Distribution: MR

Offered: in the spring semester.

One cannot receive credit for IT 102 and CS 171 and BIS 300.

This course is equivalent to CS 102. 3 hours of lecture and 3 hours of lab per week.

This course is a prerequisite.

Satisfies Computer Competence GUR

Laboratory fees \$50.

**IT 200 - Data Structures (4 cr.)**

Prerequisite: IT 102 or CS 102 or CS 171

Cross-Listed as: CS 200

This course continues the introduction to computer programming begun in CS 102 or IT 102. This course covers the development and use of data structures in computer science and object-oriented software development. Using a modern programming language, students learn about the implementation and use of abstract data types. Students are expected to apply and augment the programming knowledge acquired in previous courses to the task of developing more complex works. Topics include linked lists, stacks, queues, hash tables, common trees and tree algorithms, graphs and traversal algorithms, and common algorithms related to these structures. Students will also learn to evaluate the efficiency of the algorithms that they implement over the course of the semester.

Distribution: MR

Offered: in the fall semester.

3 hours of lecture and 3 hours of lab per week

Lab Fee \$50.

**IT 230 - Introduction to Operating Systems and Script Development (3 cr.)**

Prerequisite: IT 101 or CS 101, and IT 102 or CS 102 or CS 171

This course provides students with the foundations for working with current operating systems. Students learn to make effective use of operating systems' powerful command-line interface. They also learn how to create scripts to automate redundant tasks and scripts to act as glue between otherwise independent applications.

Distribution: MR

Offered: in the fall semester.

### **IT 240 - Foundations of Web Systems (3 cr.)**

Prerequisite: At least sophomore standing and at least one CS or IT course.

This course provides the student with the foundation for website development and maintenance. Students learn about web browsers, how URLs are resolved, and how webpages are returned. They learn hypertext, self-descriptive text, webpage design, web navigational systems, and digital media. Students become proficient with common tools for authoring and publishing webpages.

Distribution: MR

Offered: in the spring semester.

### **IT 250 - Data Communications and Networks (3 cr.)**

Prerequisite: IT 101 or CS 101 or IT 102 or CS 102, or BIS 300.

Cross-Listed as: BIS 413

This is a study of the concepts and terminology of data communications, network design, and distributed information systems. Major topics include communication concepts, network architectures, data communications software and hardware, and the impact of communications technology on information systems.

Distribution: MR

### **IT 300 - Database Management Systems (3 cr.)**

Prerequisite: IT 101 or CS 101 or BIS 300 and junior standing.

Cross-Listed as: BIS 321

This course is a study of the concepts, theory, design techniques, and information retrieval methods, emphasizing the relational database model and structured query language (SQL). It incorporates database design and application development CASE (computer aided software engineering) tools, with emphasis on the entity-relational (E-R) model and unified modeling language (UML). Topics include data modeling and organization, database architecture, SQL, and database connectivity technologies. Design and implementation projects are required.

Distribution: MR

Depending on major, this course is equivalent to CS 364.

CS 364 is allowed to count for IT 300 in the IT major, but IT 300 is not allowed to count for CS 364 in the CS major.

Cannot receive credit for IT 300 and CS 364.

### **IT 310 - System Operation and Administration (3 cr.)**

Prerequisite: IT 230 and at least junior standing.

This course focuses on the organization and architecture of computer systems and major components such as process management, I/O

management, and resource management. The course also enables the students to learn how to perform standard system administrative tasks, such as installing system and applications software, installing new hardware, managing user accounts, backing up and restoring file systems, boot-up and shutdown, and monitoring system performance.

Offered: in alternate fall semesters.

### **IT 320 - Foundations of Human Computer Interaction (3 cr.)**

Prerequisite: CS 101 or IT 101, and CS 102 or IT 102 or CS 171

Students learn the basic concepts of human computer interaction to evaluate, design, and improve the usability of a system. These basic concepts include human factors, performance analysis, cognitive processing, usability studies, environment, and user training. Students will gain practical experience by applying these concepts to web systems.

Distribution: MR

Offered: in fall semester.

This course is a prerequisite.

### **IT 330 - Fundamentals of Cybersecurity (3 cr.)**

Prerequisite: IT 230 and IT 250, or permission of instructor.

This course introduces the fundamentals of cybersecurity, including information security, compliance and operational security; threats and vulnerabilities; application, data, and host security; access control and identity management; and cryptography. The course covers new topics in cybersecurity security as well, including psychological approaches to social engineering attacks, Web application attacks, vulnerability assessment, data loss prevention, cloud computing security, and application programming development security.

Offered: in fall semesters.

Formerly Network Security Concepts

### **IT 333 - Independent Study in Information Technology (1-3 cr.)**

See "Independent Study".

### **IT 350 - Web Systems Development (3 cr.)**

Prerequisite: IT 102 or CS 102 or CS 171, IT 240 and at least concurrent enrollment in IT 300/BIS 321/CS 364

Web applications are the heart and soul of ecommerce. Students will learn to create interactive web applications that are backed by databases using current server-side technologies. Students also learn basic web server administration, and how to secure websites and web communications.

Offered: in alternate fall semesters.

### **IT 360 - Network Management and Operations (3 cr.)**

Prerequisite: IT 230 and IT 250.

In this course, students learn about various tasks that are involved in day-to-day network management and operations. Students will learn how to perform tasks such as network configuration, remote administration access, IP configuration (static and dynamic), setting up name servers, namespace configuration and management, and how to troubleshoot network problems and fix them.

Offered: in alternate fall semesters.



**IT 390 - Special Topics in Information Technology (1-3 cr.)**

Topics offered depend upon student interest as well as particular interests of instructors. The course is offered as often as faculty time and student interest permit and may be repeated for credit if the topic differs.

**IT 410 - Advanced Topics in System Administration (3 cr.)**

Prerequisite: IT 310.

This course is a study of current advanced topics in system administration. Topics may include the latest security issues, advances in storage technologies, advances in network file systems, latest technology used in setting up shared file systems, high performance computer system maintenance, and latest strategies used for backup and restoration.

Offered: in alternate spring semesters.

**IT 430 - Ethical Hacking (3 cr.)**

Prerequisite: IT 330.

This course introduces students to techniques associated with the cybersecurity practice known as penetration testing or ethical hacking, and network defense. The course covers planning, information discovery, scanning, vulnerability assessment, exploitation, post-exploitation. The course also covers network defense fundamentals, firewall configuration, log analysis, and network forensics.

Offered: in spring semesters.

Formerly Advanced Topics in Network Security

**IT 435 - Cybersecurity Operations (3 cr.)**

Prerequisite: IT 330.

This course focuses on knowledge and skills related to security concepts, security monitoring, host-based analysis, network intrusion analysis, and security policies and procedures. Students will learn how to monitor and fight threats to an organization's IT infrastructure, assess the scope of the attack and affected systems, collect data for further analysis, and understand and follow established procedures for response to alerts converted to incidents. Students will learn how to assess security systems and measure for weaknesses and possible improvements.

Offered: in fall

**IT 450 - Advanced Topics in Web Design and Development (3 cr.)**

Prerequisite: IT 350.

This course is a study of current advanced topics in web design and development. Topics such as load balancing, quality of service, caching, information architecture, website administration tools, usability, and security in ecommerce will be studied.

Offered: in alternate spring semesters.

**IT 460 - Advanced Topics in Network Administration (3 cr.)**

Prerequisite: IT 360.

This course is a study of current advanced topics in network administration. Topics such as latest software/hardware network management tools, switches and routers, firewall configurations, and latest tools to manage and troubleshoot enterprise and service provider networks will be studied.

Offered: in alternate spring semesters.

**IT 480 - Internship in Information Technology (3 cr.)**

See "Internships".

Distribution: MR

**IT 481 - Internship in Information Technology (3 cr.)**

See "Internships".

Distribution: MR

**IT 490 - Special Topics in Information Technology (1-3 cr.)**

Topics offered depend upon student interest as well as particular interests of instructors. The course is offered as often as faculty time and student interest permit and may be repeated for credit if the topic differs.

**JRNL - JOURNALISM****JRNL 100 - Journalism: Practices and Principles (3 cr.)**

Prerequisite: ENGL 132 or equivalent with grade of "C-" or better

This course offers an introduction to the nature, problems, and ethics of newspaper work as well as the organization and techniques of the modern newsroom. The course places special emphasis on writing the news story in its various forms. Extensive written assignments are required.

**JRNL 120 - Producing The Westerner (1 cr.)**

Prerequisite: Work on The Westerner and permission of the instructor.

This course gives students hands-on experience with producing a college newspaper. Students may be responsible for writing, editing, photographing, graphic design, layout, advertising, and aspects of business management.

Course may be repeated once for credit.

**JRNL 121 - Producing The Westerner (1 cr.)**

Prerequisite: Work on The Westerner and permission of the instructor.

This course gives students hands-on experience with producing a college newspaper. Students may be responsible for writing, editing, photographing, graphic design, layout, advertising, and aspects of business management.

Course may be repeated once for credit.

**JRNL 220 - Producing a College Newspaper (3 cr.)**

Prerequisite: Permission of the instructor.

In this course, students learn all aspects of newspaper production, including writing, editing, layout, research, checking sources, and meeting deadlines for the university's newspaper, *The Westerner*.

### **JRNL 303 - Contemporary Journalism (3 cr.)**

Prerequisite: COMM 100 or COMM 233; and JRNL 100 or JRNL 101

This course develops students' nonfiction storytelling, research, and writing skills, focusing in particular on the various media platforms for which journalists produce material in contemporary society. Students consider similarities and differences among different styles of journalism, examine the expectations of news consumers in different media and the impact those expectations have on journalism as a profession, and develop stories that include multimedia components. Students will be expected to produce stories worthy of publication and/or broadcasting as a result of this course.

### **JRNL 333 - Independent Study in Journalism (1-3 cr.)**

See "Independent Study".

### **JRNL 360 - Sportswriting (3 cr.)**

Prerequisite: JRNL 100 or JRNL 101, and two courses in English writing with grades of "C" or better.

Cross-Listed as: COMM 360

This course introduces students to the craft of sportswriting. Beginning with a discussion of how to approach writing in general, the course focuses principally on analyzing models of successful sportswriting and developing skills in producing sportswriting. Students will be expected to read copiously and critically and to write (and revise) several short assignments as well as one research-based project.

### **JRNL 362 - Entertainment Journalism (3 cr.)**

Prerequisite: JRNL 100 or JRNL 101

This course analyzes the increasing popularity and practice of entertainment journalism, with an eye toward helping students understand how and why this form of journalism has become so prominent in contemporary media industries. The course examines how the high standards of journalism: truth, accuracy, correct grammar and punctuation, and verification of facts, have shaped this field, as well as how failures to maintain these high standards have had severe consequences. Students will be required to read entertainment news stories as well as analyses of how such stories function in popular culture, and to produce entertainment stories for print, online, social, and/or audio-visual media to demonstrate knowledge and expertise in this field of study.

Distribution: MR

### **JRNL 370 - Advanced Radio Reporting (3 cr.)**

Prerequisite: COMM 241 or COMM 245, and COMM 251; or JRNL 100 or JRNL 101, and COMM 245

Cross-Listed as: COMM 371

This course provides students with professional radio reporting opportunities. It focuses on radio news reporting with instruction and real-life applications in developing, researching, writing, and producing broadcast news stories to be aired on National Public Radio Station WAMC. Students receive on-the-air talent techniques and one-on-one coaching for professional voice-over productions. Story ideas are assigned by the instructor, the WAMC news director,

and news producers; students must also generate his/her own story proposals.

Distribution: MR

### **JRNL 390-393 - Special Topics in Journalism (1-3 cr.)**

Prerequisite: Junior standing

Topics offered depend upon student interests as well as particular interests of instructors.

This course may be repeated for credit if topic differs.

## **LA - LIBERAL ARTS**

### **LA 100 - First Year Seminar (2 cr.)**

This course represents a segment of the general education requirements, specifically pertaining to personal development and relevant academic skills. First Year Seminar is a course designed to ease the transition to the first year of college and to explore the value of college and develop a sense of personal identity. While course content can vary from section to section, there is a commonly shared core of objectives that characterizes the seminar. Organized around academic interests, there is structured opportunity to become acquainted with the intricacies of particular academic disciplines, or, if undecided, to engage career exploration activities. As regards general education components, the seminar serves as an introduction to critical thinking, a platform for exploring information literacy, and practical application of oral presentation strategies. One of the unique components of the course is linking the role of instructor to that of academic advisor for the students enrolled in any particular section. The course is also distinguished by the use of student assistants known as First Year Seminar Assistants whose role is to support students in the academic transition challenges of the first year.

Distribution: GUR

### **LA 102 - First Year Seminar for Pharmacy (1 cr.)**

Prerequisite: Pre-Pharmacy majors only.

Intended for pre-pharmacy students, this course is designed to ease students' transition to their first year of college and to allow them to explore the value of college and personal identity. This seminar provides a structured opportunity for pre-pharmacy students to become acquainted with the intricacies of their chosen academic discipline and to engage in career exploration activities. This first year seminar course emphasizes both the learning (academics, resources, information literacy, and critical thinking) and living (social and extracurricular) aspects that are relevant to the students' college experiences and responsibilities.

formerly First Year Seminar for Pre-Pharmacy

### **LA 103 - College Success Coaching Experience (0 cr.)**

Prerequisite: First Year students with fewer than 27 credits.

Designed for those students who have been admitted to the college with full participation in this program as a condition of acceptance. Prerequisites are less than 24 credits, first term of enrollment.

Course will meet one time per week for 50 minutes

### **LA 105 - International Student Seminar (1 cr.)**

Prerequisite: New international student with fewer than 24 credits. To be taken in the first semester/term or enrollment.

This course is designed specifically for international students who are new to Western New England University, providing a general orientation to the University and the surrounding area while addressing transitional issues an international student may face in the first semester of study. In this 15 week course, students will learn about the resources available to them and develop skills for college success in an American classroom.

Changed from 0 cr. to 1 crs.

### **LA 110 - First Year Seminar Arts & Sciences (3 cr.)**

Prerequisite: First Year Students Only

The course represents a segment of the general education requirements, specifically pertaining to personal development and relevant academic skills. First Year Seminar is a course designed to ease the transition to the first year of college and to explore the value of college and develop a sense of personal identity. While course content can vary from section to section, there is a commonly shared core of objectives that characterizes the seminar. Organized around academic interests, there is structured opportunity to become acquainted with the intricacies of particular academic disciplines, or, if undecided, to engage major and/or career exploration activities. As regards general education components, the seminar serves as an introduction to critical thinking, a platform for exploring information literacy, and practical application of oral presentation strategies. One of the unique components of the course is linking the role of instructor to that of academic advisor for the students enrolled in any particular section. The course is also distinguished by the use of student assistants known as First Seminar Assistants whose role is to support students in the academic transition challenges of the first year. In addition, the LA 110 course offers the opportunity for the faculty to use a medium of their choice to emphasize critical thinking and writing skills as they relate to contemporary issues, making students more aware of local, national, and global issues that will influence the world they live in.

Distribution: GUR

### **LA 150 - Writing and Reading Laboratory I (1 cr.)**

Prerequisite: Must be taken concurrently with ENGL 130, or ENGL 132, or ENGL 133

This is a one-credit laboratory course designed to supplement the work in certain sections of ENGL 132 English Composition I: College Reading and Writing with a review of English fundamentals. Topics include sentence structure, mechanics, and usage.

### **LA 151 - Writing and Reading Laboratory II (1 cr.)**

Prerequisite: Must be taken concurrently with ENGL 130, or ENGL 132, or ENGL 133

This is a one-credit laboratory course that introduces basic rhetorical principles and applies the principles taught in LA 150 to assignments in certain sections of ENGL 133 English Composition II: Introduction to Literature.

### **LA 175 - Academic Reading Strategies I (1 cr.)**

Prerequisite: Must be taken concurrently with ENGL 130, or ENGL 132, or ENGL 133

This is a one-credit laboratory course that provides students with an understanding of the skills needed for proficiency in college reading.

Some theory is presented, but the emphasis is on the application of the skills to college reading.

### **LA 176 - Academic Reading Strategies II (1 cr.)**

Prerequisite: Must be taken concurrently with ENGL 130, or ENGL 132, or ENGL 133

This is a one-credit laboratory course that applies the strategies taught in LA 175 to textbooks from courses across the curriculum.

### **LA 190 - Special Topics in Liberal Arts (1-3 cr.)**

Liberal Arts topics that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **LA 250 - Language Support Lab I (1-2 cr.)**

This is a one-credit laboratory course which gears instruction to the individual needs of students who speak English as a foreign or second language or who come from a bilingual background. The course is usually taken concurrently with a designated section of ENGL 132. May be taken for two credit hours by arrangement.

### **LA 251 - Language Support Lab II (1-2 cr.)**

This is a one-credit laboratory course that continues the work of LA 250. This course is usually taken concurrently with a designated section of ENGL 133. May be taken for two credit hours by arrangement.

### **LA 275 - Guided Research Strategies for Thesis and Project Writers (1 cr.)**

Prerequisite: Recommended for sophomores and above. Target audience is sophomores working on faculty research, first semester seniors, and second semester juniors who will be completing a senior thesis, capstone project, or an independent research project. May be repeated once for credit.

This course guides students through the research process for thesis or in-depth written projects. Building on the first-year introductions to information literacy, this class extends students' information research skills to more advanced, discipline-specific techniques and tools. Beginning with their own topics, students learn to form research questions or problems, develop strategies for discovering authoritative information, and the effective and ethical use of sources. Students have ample time for hands-on research pertinent to their project, with immediate guidance and feedback from the instructor. The course meets in a computer lab. Students are encouraged to have a research topic before beginning this course.

Offered: in the fall.

### **LA 276 - Guided Research Strategies for Thesis and Project Writers (1 cr.)**

Prerequisite: Recommended for sophomores and above. Target audience is sophomores working on faculty research, first semester seniors, and second semester juniors who will be completing a senior thesis, capstone project, or an independent research project. May be repeated once for credit.

This course guides students through the research process for thesis or in-depth written projects. Building on the first-year introductions to information literacy, this class extends students' information research skills to more advanced, discipline-specific techniques and

tools. Beginning with their own topics, students learn to form research questions or problems, develop strategies for discovering authoritative information, and the effective and ethical use of sources. Students have ample time for hands-on research pertinent to their project, with immediate guidance and feedback from the instructor. The course meets in a computer lab. Students are encouraged to have a research topic before beginning this course.

Offered: in the spring.

### **LA 277 - Guided Research Strategies for Thesis and Project Writers (1 cr.)**

Prerequisite: Recommended for sophomores and above. Target audience is sophomores working on faculty research, first semester seniors, and second semester juniors who will be completing a senior thesis, capstone project, or an independent research project. May be repeated once for credit.

This course guides students through the research process for thesis or in-depth written projects. Building on the first-year introductions to information literacy, this class extends students' information research skills to more advanced, discipline-specific techniques and tools. Beginning with their own topics, students learn to form research questions or problems, develop strategies for discovering authoritative information, and the effective and ethical use of sources. Students have ample time for hands-on research pertinent to their project, with immediate guidance and feedback from the instructor. The course meets in a computer lab. Students are encouraged to have a research topic before beginning this course.

Offered: in the fall.

### **LA 278 - Guided Research Strategies for Thesis and Project Writers (1 cr.)**

Prerequisite: Recommended for sophomores and above. Target audience is sophomores working on faculty research, first semester seniors, and second semester juniors who will be completing a senior thesis, capstone project, or an independent research project. May be repeated once for credit.

This course guides students through the research process for thesis or in-depth written projects. Building on the first-year introductions to information literacy, this class extends students' information research skills to more advanced, discipline-specific techniques and tools. Beginning with their own topics, students learn to form research questions or problems, develop strategies for discovering authoritative information, and the effective and ethical use of sources. Students have ample time for hands-on research pertinent to their project, with immediate guidance and feedback from the instructor. The course meets in a computer lab. Students are encouraged to have a research topic before beginning this course.

Offered: in the spring.

### **LA 290 - Special Topics in Liberal Arts (1-3 cr.)**

Liberal Arts topics that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **LA 333 - Independent Study in Liberal Arts (1-3 cr.)**

See "Independent Study".

### **LA 390 - Special Topics in Liberal Arts (1-3 cr.)**

Liberal Arts topics that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **LA 391 - Student Literacy Volunteers (1-3 cr.)**

Prerequisite: Sophomore standing or higher.

This is an introduction to the problems of illiteracy and to the techniques of teaching literacy. Students receive elementary training in techniques and practice those techniques under supervision in the Greater Springfield community.

### **LA 490 - Special Topics in Liberal Arts (1-3 cr.)**

Liberal Arts topics that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **LA 491 - Student Literacy Volunteers II (1-3 cr.)**

Prerequisite: Sophomore standing or higher, LA 391.

This is a continuation of the work in LA 391.

## **LSOC - LAW AND SOCIETY**

### **LSOC 101 - Law & Society I: Introduction to Law & Society (3 cr.)**

This is an introductory survey course which examines the interrelation between law and society, viewing law as a cultural development and a product of history, religion, philosophy, economics, politics, and geography. The survey will emphasize the development of legal concepts and institutions in the United States, as well as in other societies and on the international level.

Distribution: MR

Formerly "Introduction to Law and Society"

### **LSOC 102 - Law & Society II: Legal Justice and Social Justice (3 cr.)**

This courses explores the relationship between various conceptions of legal and social justice as well as the relationships between law, justice, and politics. Featured prominently are the nature and the sociopolitical implications of the American "carceral state" and the rise of "cimmigration".

Formerly LSOC 206 "Legal Justice and Social Justice"

### **LSOC 202 - The Literature of the Law (3 cr.)**

Prerequisite: LSOC major and junior status or permission of the instructor.

This course is founded on the notion that, just as the "Gettysburg Address" is both a political document and great literature, so, too, does much of past legal writing rise to such a level of splendid prose as we all may wish to emulate. In addition to plays and novels whose plots involve a deep legal milieu, this course will also study the clear prose of such writers as Coke, Blackstone, Marshall, and Holmes.

### **LSOC 207 - Introduction to Political Theory (3 cr.)**

Prerequisite: POSC 101, or INST 101, POSC 102, three credit hours of European history or sophomore standing.

Cross-Listed as: POSC 207 and PH 207

Survey course designed to introduce students to major political thinkers and schools of thought with an emphasis on classical liberalism and the social contract tradition

Distribution: MR

Offered: in fall

Formerly Western Political Thought

### **LSOC 225 - Law and Judicial Politics (3 cr.)**

Prerequisite: POSC 102.

Cross-Listed as: POSC 225

This course will explore the basic principles and categories of American law, its processes and institutions. We will look at the legal profession, the guardians of the law, from their education to their roles in the legal system, and we will examine our courts and judges and the politics that surround their work.

Not open to students w/POSC 325, POSC 326 or CJ 234.

### **LSOC 226 - The Legal Profession (3 cr.)**

Prerequisite: POSC 101, POSC 102, INST 101, LSOC 101, LSOC 102, CJ 101, or Sophomore standing.

Cross-Listed as: POSC 226

LSOC/POSC 226 introduces the legal profession from the perspective of both law practitioners and the social sciences; provides an inside view of the practice of law as well as social science perspectives on the role of the lawyer in society; considers issues associated with access to justice, legal ethics, and cause-lawyering among others; clarifies the connections between the goals of liberal education, on the one hand, and legal education, on the other; and compares and contrasts the values, perspectives, and assumptions of social science and ethics with those of the legal profession.

Offered: Spring Only

### **LSOC 290 - Special Topics in Law and Society (1-3 cr.)**

Topics in law and society that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **LSOC 307 - Justice, Diversity, and Democratic Citizenship (3 cr.)**

Prerequisite: Junior or Senior standing.

Cross-Listed as: POSC 307

LSOC/POSC 307 examines how contemporary liberal democracies can and should come to terms with issues of national, cultural, ethnic, religious, and racial diversity. The course considers (1) whether, under what conditions, and to what extent national, cultural, ethnic, religious, and racial minorities can and should be accommodated, integrated, and/or assimilated in society and (2) to what extent (and in what ways) the state can and should promote a particular ideal of liberal democratic citizenship.

Offered: in spring

Formerly LSOC 230

Formerly When Cultures Collide

### **LSOC 325 - Constitutional Law (3 cr.)**

Prerequisite: POSC 102 and Junior Standing

Cross-Listed as: POSC 325

This is a study of constitutional principles as decided by the U.S. Supreme Court. Emphasis is on the Court's roles as arbiter of federalism and separation of powers and interpreter of the Bill of Rights and the Civil War Amendments.

Distribution: MR

### **LSOC 330 - Contemporary Political Theory (3 cr.)**

Prerequisite: Junior Standing

Cross-Listed as: POSC 330

Distribution: MR

Cross-listed as LSOC 330 and PH 330

### **LSOC 333 - Independent Study in Law and Society (1-3 cr.)**

See "Independent Study".

### **LSOC 334 - Independent Study in Law and Society (1-3 cr.)**

See "Independent Study".

### **LSOC 340 - International Governance and Law (3 cr.)**

Prerequisite: POSC 101 or INST 101 or POSC 102 and junior standing.

Cross-Listed as: POSC 340

This is analysis of international law and organization in the 20th century. Special attention is paid to landmark cases and principles as well as to the structure and processes of the United Nations, European Community, and other experiments in international organization.

Distribution: MR

Formerly "International Law and Organization"

### **LSOC 344 - Comparative Legal Systems (3 cr.)**

Prerequisite: POSC 201 and junior standing or permission of the instructor.

This course will review the major systems now operative on each continent and examine and compare the basic principles of each. It will consider tribal and communal approaches to conflict resolution as well as national legal systems.

Distribution: MR

Formerly POSC 344.

### **LSOC 390 - Special Topics in Law and Society (1-3 cr.)**

Topics in law and society that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **LSOC 440 - Undergrad Research in Law and Society (1-3 cr.)**

Prerequisite: Junior standing and permission of instructor.

See "Undergraduate Research".

### **LSOC 441 - Undergrad Research in Law and Society (1-3 cr.)**

Prerequisite: Junior standing and permission of instructor.

See "Undergraduate Research".

### **LSOC 480 - Internship in Law and Society (1-3 cr.)**

See "Internships".

### **LSOC 481 - Internship in Law and Society (1-3 cr.)**

See "Internships".

### **LSOC 490 - Senior Seminar in Law and Society (4 cr.)**

Prerequisite: Senior standing

This course explores advanced topics in law and society, with a particular focus on questions of civil and criminal justice and individuals' access thereto. Students in the course will be required to research and write a substantial research term paper.

From 3 credits to 4 credits in Fall'19.

## **MAN - MANAGEMENT**

### **MAN 204 - Management and Organizational Behavior (3 cr.)**

Cross-Listed as: HONB 204

The course examines individual, interpersonal, and group behavior in organizations. Coverage includes OB concepts as they influence effective management practice and leadership. Course content is designed to facilitate the attainment of key learning outcomes focused on the understanding and recognition of: the role that personality and perception play in influencing behavior in organizations; concepts associated with effective work design; theories and concepts of decision-making and problem solving; theories and concepts of motivation; theories and concepts of leadership; and theories and concepts from the behavioral sciences in developing strategies for effective teamwork and other organizational processes. Course includes career readiness element.

Distribution: MR/CR

Offered: in Fall and Spring semester.

Formerly "Organizational Behavior"

### **MAN 240 - Business and Society (3 cr.)**

Cross-Listed as: HONB 240

This course explores the connections between businesses and the wider social environment of which they are a part. Key learning outcomes focus on: recognition of ethical issues with respect to business activities, the basis for government regulation of business and business' involvement in the public policy process, identification and analysis of stakeholder issues, and the nature of corporate social responsibility.

Formerly BUS 240.

This course can be taken to fulfill the Ethical Perspective (PH 211) requirement.

Cannot take both PH 211 and MAN 240/HONB 240 for credit.

This course does not fulfill the ethics requirement for Arts & Sciences or Engineering students.

### **MAN 303 - Interpersonal Skills for Leading (3 cr.)**

Prerequisite: MAN 204/HONB 204; and COMM 233.

Competency in interpersonal skills is essential for leadership in organizations. This course utilizes theory and research in the social and behavioral sciences to identify best practices in the interpersonal dimensions of leading. Key learning outcomes include the

development of interpersonal skills involved in active listening, providing feedback, effective persuasion, and managing conflict in a diverse workplace. Course includes career readiness element.

Distribution: MR

Offered: in Fall.

Formerly MAN 201 "Interpersonal Skills for Leading"

### **MAN 305 - Managing for Sustainability (3 cr.)**

Prerequisite: MAN 204/HONB 204

The course focuses on the principles and practices of managing organizations sustainably. The course integrates concepts of sustainability into the management of organizations with respect to social, financial and environmental criteria. Key learning objectives include recognition and application of the concept of sustainable development in business; the ways in which principles of sustainability can provide businesses with competitive advantages; various bases for evaluating the economic, environmental, and social impact of organizational activities; and how managers contribute to the achievement of sustainable business development.

### **MAN 306 - Global Sustainability (3 cr.)**

Prerequisite: MAN 204/HONB 204

This travel/study course explores the impact of organizational activities on sustainability through trips of one-to-three week's duration during school breaks that are chaperoned and supervised by a faculty member. The travel component of the course will be to a geographical area either inside or outside the US where global elements of sustainability can be addressed effectively. This course involves research and discussion of sustainability issues relevant to the location visited. The goal of the course is to allow undergraduate students opportunities to understand the financial, social and environmental impact of business practices in the visited region or country and appreciate how the financial, social and environmental issues of that location influences the conduct of business.

### **MAN 311 - International Management (3 cr.)**

Prerequisite: MAN 204/HONB 204

This course focuses on issues of nations and cultures with respect to central themes in management practice including motivation, communication, negotiation, leadership, ethics and social responsibility, organizational structure, human resources, and diversity. Learning outcomes are focused on the recognition and application of relevant concepts and practices with respect to: an awareness of the influence of culture on behavior, particularly in terms of leadership, motivation, decision-making, and conflict; familiarity with the types of situations and issues that managers may confront when working internationally and/or returning home; and an appreciation for the complexity of ethics and social responsibility in the global environment.

Offered: in spring of odd years

### **MAN 315 - Organizational Theory (3 cr.)**

Prerequisite: MAN 204/HONB 204 or SO 101

Cross-Listed as: SO 315

The course examines organizations at a macro-level in order to develop skills for analyzing the complicated situations in contemporary organizations. Key learning outcomes focus on the understanding and application of vocabulary of organization theory; recognizing existing organizational theories, models, and concepts;

historical approaches to organizational theorizing; strengths and weaknesses of different organizational designs; the role of conflicting perspectives, ambiguity, paradox, and contradictions as they relate to organizational life; inherent tensions of specialization, and integration that characterize organizational designs and processes.

### **MAN 316 - Intercultural Competence (3 cr.)**

Prerequisite: Junior or Senior Standing.

Intercultural competence, the ability to shift cultural perspective and appropriately adapt behavior to cultural differences and commonalities, is an essential component of contemporary business life. Because “culture” is the core concept of intercultural competence, we spend a significant portion of this course exploring the concept of culture, reading and considering expressions of culture by members of diverse cultures, and discussing a wide range of strategies for enhancing a set of cognitive, affective and behavioral skills that support effective and appropriate interaction in a variety of cultural contexts. Readings, activities and discussions emphasize the concept of culture, the nature of intercultural competence, the relevance of intercultural competence to contemporary business, and the development of an enhanced understanding of the norms and values of one’s own culture and the culture of others.

### **MAN 322 - Managing a Diverse Workforce (3 cr.)**

Prerequisite: MAN 204/HONB 204, or PSY 101, or SO 101

As the labor force becomes increasingly diverse, a strong emphasis is being placed on diversity-related issues of all kinds in the workplace. Diversity in the workplace may result from differences in individual characteristics such as gender, race, ethnicity, national origin, age, religion, and physical ability/disability. Organizations need to address diversity issues in some manner if they are to compete effectively in a global economy. But what should an organization actually do about increased diversity in the workplace other than watch it happen? To address this question, this course examines issues related to managing and being a member of an increasingly diverse workforce. Learning how to deal with these issues in a manner that preserves the integrity and takes advantage of the contributions of all members of the workforce, regardless of their personal characteristics and group memberships, is encouraged.

Distribution: MR

Offered: in spring of even years

MAN 322 is equivalent to HRM 322

### **MAN 323 - Human Resource Management (3 cr.)**

Prerequisite: MAN 204/HONB 204

The course provides an overview of human resource management practices in organizations. Focus on key learning outcomes includes the understanding, application, and problem-solving associated with: the strategic role of human resource management; legal issues of HRM including selection and compensation; principles of effective employee selection; various approaches to employee training; setting and administration of compensation; pay for performance systems; approaches to performance appraisal; and value of job description and building motivation into the job design. Course includes career readiness element.

Distribution: MR

Offered: in fall and spring.

MAN 323 is equivalent to HRM 323

### **MAN 331 - A Humanistic Approach to Leadership and Management (3 cr.)**

Prerequisite: MAN 204/HONB 204

The course provides a study of fiction, biography, drama, and film as primary sources to arrive at a better understanding of how effective leadership and management occur. Key learning outcomes focus on the understanding, use, and problem-solving applications associated with: the basic differences among successful leadership styles and situational factors; personal leadership styles; leadership skills such as initiative, planning, and risk taking; application of humanistic leadership principles to work and family situations; effective leadership decisions; and non-traditional learning sources in everyday leadership opportunities.

### **MAN 333 - Independent Study in Management (3 cr.)**

See "Independent Study".

### **MAN 334 - Independent Study in Management (3 cr.)**

See "Independent Study".

### **MAN 341 - Leadership and Change (3 cr.)**

Prerequisite: MAN 204/HONB 204

This course focuses on the leadership challenges in organizations pursuing change. Key learning outcomes in the course include the understanding, use, and problem-solving applications associated with a range of current perspectives on the key elements of effective leadership, the fundamental elements and best practices in the area of organizational change, and the concepts of leadership and change.

Offered: in fall

### **MAN 353 - Leadership and Team Skills (3 cr.)**

Prerequisite: Junior or senior standing.

This course provides the opportunity to examine leadership issues from historical, sociological, and psychological perspectives, and to practice leadership and group skills within the classroom. Readings from historical biographies, sociology, and psychology will be used to gain insights into a range of leadership qualities and abilities. Students will also take a number of assessment instruments that will help them determine their own leadership profiles and will guide them in refining their skills during the semester. Students will be assigned to a specific small group that will perform an array of activities and serve as the context for personal skill building. Students will learn how to analyze a variety of leadership functions and develop a reflective practice that will enable them to continue to perfect their leadership skills in the future.

Offered: in fall

This course satisfies the Remote Work Certificate requirement.

### **MAN 370 - Project Management (3 cr.)**

Prerequisite: MAN 204/HONB 204

This course introduces the project management discipline and focuses on critical success factors in achieving project success. The roles managers and technical professionals fulfill in the project

development process will be explored with emphasis on the skill set demanded for successful project participation, contribution, and completion. Current trends in project management will be analyzed with emphasis on the impact of globalization. Key learning outcomes include: an understanding of standard project management processes, analytical techniques used in project management, and the different roles and responsibilities in projects.

Distribution: MR

Offered: in fall and spring.

This course satisfies the Remote Work Certificate requirement.

### **MAN 390 - Special Topics in Management (3 cr.)**

This is a study of advanced topics in management of special interest to management majors, but not offered on a regular basis.

### **MAN 422 - Conflict Resolution (3 cr.)**

Prerequisite: MAN 204/HONB 204

This course provides in-depth coverage of conflict-resolution in organizational settings. Key learning outcomes focus on conflict styles and response alternatives along with various modes of resolution including alternative dispute resolution, third-party intervention, mediation, and arbitration.

Offered: in spring

### **MAN 430 - Family Business Management (3 cr.)**

Prerequisite: MAN 204/HONB 204 or ENTR 251

Cross-Listed as: ENTR 430

Family Enterprises have unique challenges, problems and issues such as starting-up and on-going decision-making issues with family members, handling conflicts involving family members and non-family members, family risk profiles, taxation, estate planning, multi-generation and succession issues, going public, and selling out. This course is particularly important for students who are planning to enter family businesses upon graduation.

### **MAN 466 - Senior Seminar in Management and Leadership (3 cr.)**

Prerequisite: MAN 303, HRM 323 and MAN 370. Senior Management and Leadership majors only

The course provides students with an enhanced understanding of current perspectives on management and leadership. Key learning outcomes focus on new models of leadership practice the integration of management and leadership imperatives in global and diverse organizations, and current practices of ethical, socially responsible, and creative managerial problem-solving. Course includes career readiness element.

Distribution: MR

Offered: in spring.

Formerly Seminar in Management and Leadership

### **MAN 480 - Internship in Management (3 cr.)**

See "Internships".

Distribution: MR

### **MAN 481 - Internship in Management (1-3 cr.)**

See "Internships".

## **MATH - MATHEMATICS**

### **MATH 100 - Algebra Fundamentals (3 cr.)**

Prerequisite: One year of secondary school algebra, or placement recommendation.

This is a review of the fundamentals of high school algebra, as well as some college algebra, and is designed for students who need a review in preparation for the mathematics courses required by their major.

Offered: Fall semester

May not be counted toward the GUR Mathematical Analysis requirement.

May be taken for credit only as a general elective.

### **MATH 101 - Essential Math Skills (1 cr.)**

This course is designed to assist students who need extra practice in many of the skills necessary to be successful in Math 111. This includes reading for understanding and writing for clarity as well as working with linear, quadratic, polynomial and exponential functions. Essential Algebra skills such as computing slope, applying FOIL to multiply binomials and more will also be practiced.

Offered: Fall semester

### **MATH 107 - Mathematics For Elementary Education I (3 cr.)**

Prerequisite: Successful performance on the Western New England University placement test.

This course is the first of a two-semester sequence in mathematics that satisfies the mathematics requirement for prospective elementary teachers. Topics include an examination of whole numbers, integers, and rational numbers with an emphasis on place value, arithmetic operations, and their associated properties. A study of set theory, numeration systems, and basic number theory is also included. Problem-solving techniques and use of models and manipulatives are integrated throughout the course.

Distribution: GUR/MR

Offered: in the fall semester.

This course is a prerequisite.

### **MATH 108 - Mathematics for Elementary Education II (3 cr.)**

Prerequisite: MATH 107 or permission of the instructor.

This course is a continuation of MATH 107. A further study of the real number system focuses on rational numbers, decimals and irrational numbers. Other topics including quantitative reasoning, percents, ratios, measurement, and geometry are studied within the context of the elementary curriculum. The use of models and manipulatives are integrated throughout the course.



Distribution: GUR/MR

Offered: in the spring semester.

This course is a prerequisite.

### **MATH 109 - Precalculus Mathematics (3 cr.)**

Prerequisite: Two years of algebra and one year of geometry, or placement recommendation, or MATH 100.

This is an overview of the algebra and trigonometry needed for analytic geometry and calculus and is designed to prepare students to take calculus. Topics include basic algebra, functions and graphs, radicals and exponents, identities, and equations.

Distribution: GUR/MR

Offered: in the fall and spring semesters.

This course is a prerequisite.

### **MATH 111 - Analysis for Business and Economics (3 cr.)**

Prerequisite: Successful performance on the Western New England University placement test.

This course considers optimization and sensitivity analysis to support business decision making. Topics include building models for supply, demand, revenue, cost and profit; future and present value for compound interest (both discrete and continuous) problems and annuities; systems of equations; and linear programming.

Distribution: BUSR/CR/GUR/MR

Offered: fall and spring semesters.

This course is a prerequisite.

Formerly "Analysis for Business and Economics I"

### **MATH 114 - Analysis for Business and Economics (1 cr.)**

Prerequisite: MATH 109 is a pre- or corequisite, or permission of the department.

This course is designed to help students increase their proficiency in trigonometry. Topics include a study of angles and their measures (in degrees and radians), the unit circle, right triangle trigonometry, trigonometric functions and their graphs, trigonometric identities, trigonometric equations, and inverse trigonometric functions.

Distribution: BUSR/CR/GUR/MR

Offered: fall and spring semesters.

### **MATH 115 - Contemporary Mathematics (3 cr.)**

This course is a survey of some contemporary applications of mathematics as well as quantitative literacy. Topics, which may vary each year, will be chosen from critical thinking, problem solving, logic, uncertainty, the Consumer Price Index, compounding, savings plans, investments, loans, credit cards and mortgages, income taxes, the Federal Budget, proportion and the golden ratio, voting, apportionment, and scheduling problems in the business world.

Distribution: GUR

Offered: in the fall semester.

### **MATH 117 - Mathematical Reasoning (3 cr.)**

This course is intended to satisfy two objectives. One objective is to learn some of the methods used in mathematics to solve problems. The areas of mathematics to be considered may include logic, algebra, geometry, number theory, counting (sometimes referred to as combinatorics), graph theory, etc. A second objective is to learn how a mathematical approach can assist in the general endeavor of solving problems. The approach includes: stating problems clearly and concisely, determining what is important and what is irrelevant, making conjectures, justifying conclusions using logic, etc. Various problem-solving strategies will be introduced and applied.

Distribution: GUR

Offered: in the fall and spring semesters.

### **MATH 120 - Intro Statistics for the Arts & Sciences (3 cr.)**

Prerequisite: Successful performance on Western New England University placement test.

This course offers an introduction to the basic descriptive and inferential statistics. Techniques for visualizing, analyzing, and interpreting data are explored. Topics include data display, data visualization, frequency distributions, measures of central tendency and dispersion, correlation and regression, confidence intervals, and one- and two-sample hypothesis testing.

Distribution: GUR/MR

Offered: fall and spring semesters.

Credit for both this course and MATH 121 or QR 112, is not permissible.

### **MATH 121 - Introductory Probability and Statistics (3 cr.)**

Prerequisite: Successful performance on Western New England University placement test.

In this course, we introduce elementary probability, explore several measures of centrality and dispersion, introduce the estimation concept for both point and interval, and present the hypothesis testing concept. We complement the elementary probability with conditional probability and Bayes rule. In addition, we introduce linear regression and contingency tables as the main data analysis tool.

Distribution: GUR/MR

Offered: fall and spring semesters

Credit for this course and MATH 120 or QR 112, is not permissible.

### **MATH 123 - Calculus I for Management, Life, and Social Sciences (3 cr.)**

Prerequisite: Three years of high school mathematics including two years of algebra.

This course is an introduction to the topics and techniques of calculus and is designed primarily for majors in business and the life and social sciences. It is a study of functions, including exponential and logarithmic functions, limits, continuity, the derivative, and applications of the derivative. Business related applied topics include supply and demand functions, and marginal cost, revenue, and profit. The techniques learned are applied in problems such as population trends, drug absorption rates, velocity, and acceleration. There is an emphasis on rates of change, curve sketching, and maximizing and

minimizing functions.

Credit for both this course and MATH 133 is not permissible.

Distribution: BUSR/CR/GUR/MR

Offered: fall and spring semesters.

This course is a prerequisite.

Credit for both this course and MATH 127 or MATH 133 is not permissible.

### **MATH 124 - Calculus II For Management, Life, and Social Sciences (3 cr.)**

Prerequisite: MATH 123 or MATH 127 or MATH 133.

This course is a study of the techniques and applications of integration and multivariable calculus. The applied topics studied include models of growth and decay, continuous interest, payments on loans, and consumers' and producers' surplus.

Credit for both this course and MATH 134 is not permissible.

Distribution: BUSR/CR/GUR

Offered: in the spring semester.

### **MATH 127 - Calculus I with Pre-Calculus Review (5 cr.)**

Prerequisite: MATH 109 or placement recommendation.

This course is the first half of an introduction to single-variable calculus with an emphasis on trigonometric, exponential, and logarithmic functions, and has a review of precalculus topics incorporated throughout. Calculus topics include limits, the derivative, differentiation rules, curve-sketching, optimization, linear approximation, Newton's method, L'Hopital's rule, and antiderivatives. Precalculus topics include domain and range of functions, function operations and transformations, polynomial and rational expressions, properties of exponents, inverse functions, exponential and logarithmic functions, trigonometric and inverse trigonometric functions, and solving equations and inequalities.

Distribution: BUSR/CR/GUR

Offered: in the spring semester.

### **MATH 130 - Problem Solving in Calculus (1 cr.)**

Corequisite: MATH 133

This course is designed to provide review and practice of those skills from algebra, geometry, precalculus, and trigonometry that are important for success in MATH 133, Calculus I. Students demonstrate mastery of skills through a gateway exam that is administered several times throughout the semester.

Offered: fall semester

The course will be letter graded A - F as of Fall'21.

This course was graded pass/fail.

### **MATH 133 - Calculus I (4 cr.)**

Prerequisite: MATH 109 or the equivalent.

This course is the first half of an introduction to single-variable calculus with an emphasis on trigonometric, exponential, and logarithmic functions. Topics include functions, mathematical

models, limits, continuity, the derivative and applications of the derivative, antiderivatives, the integral, and the fundamental theorem of calculus.

Distribution: ER/GUR/MR

Offered: fall and spring semesters.

This course is a prerequisite.

Credit for both this course and MATH 123 or MATH 127 is not permissible.

### **MATH 134 - Calculus II (4 cr.)**

Prerequisite: MATH 127 or MATH 133

This course is the second half of an introduction to single variable calculus, with an emphasis on trigonometric, exponential, and logarithmic functions. Topics include antiderivatives, techniques of integration, applications of integration, infinite sequences and series, approximating functions, Taylor series and an introduction to differential equations. A computer algebra system such as Mathematica may be used.

Credit for both this course and MATH 124 is not permissible.

Distribution: ER/GUR/MR

Offered: fall and spring semesters.

This course is a prerequisite.

Credit for both this course and MATH 124 is not permissible.

### **MATH 150 - Applied Discrete Mathematics (3 cr.)**

Topics include congruence and modular arithmetic, counting techniques, relations and functions, sets, logic, probability, graphs, trees, and graph coloring. Applications include RSA cryptography, SQL, hash tables and register allocation.

Distribution: GUR/MR

Offered: in the spring semester.

This course is a prerequisite.

### **MATH 190 - Special Topics in Mathematics (1-3 cr.)**

Topics in mathematics that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

Distribution: GUR

### **MATH 221 - Introductory Probability & Statistics II (3 cr.)**

Prerequisite: MATH 120 or MATH 121 or BIS 221 or IE 212 or PSY 207

Students continue their introduction to statistics, by furthering their understanding of the statistical topics and establishing statistical thinking. Topics include basic probability theories, commonly used discrete and continuous distributions of random variables, estimation and inference for several parameters. Other statistical topics like ANOVA, nonparametric statistics, and Bayesian inference will be discussed as well. Basic calculation and simple simulations in R will be introduced.

Distribution: GUR/ER/MR

Offered: Fall semester

This course is a prerequisite.

### **MATH 235 - Calculus III (3 cr.)**

Prerequisite: MATH 134 or MATH 124.

This is an extension of the basic concepts of calculus to functions of several variables. Topics include parametric equations, polar coordinates, vectors and vector-valued functions, partial differentiation and applications, multiple integration and applications, vector fields, and line integrals. A computer algebra system such as Mathematica may be used.

Distribution: GUR/ER/MR

Offered: fall and spring semesters.

This course is a prerequisite.

### **MATH 236 - Differential Equations (3 cr.)**

Prerequisite: MATH 134.

This is a survey of the standard solution methods and applications of ordinary differential equations. The emphasis is on first and second order equations, and the topics include various solution methods, mathematical modeling, qualitative analysis, vibration models, and Laplace transforms.

Distribution: GUR/ER/MR

Offered: fall and spring semesters.

This course is a prerequisite.

### **MATH 245 - Topics in Linear Algebra and Calculus (3 cr.)**

This course is a survey of topics from linear algebra and calculus. Topics from linear algebra include matrices and matrix operations, Euclidean  $n$ -space, solving systems of equations, linear transformations, orthogonal projections, eigenvalues, and eigenvectors. Topics from calculus include polynomial, rational, exponential and logarithmic functions, limits, continuity, derivatives and optimization problems.

Distribution: GUR

Offered: Spring semester

This course is a prerequisite.

### **MATH 251 - Advanced Discrete Mathematics (3 cr.)**

Prerequisite: MATH 150 or permission.

This is a study of proof techniques and the writing of mathematical arguments in areas such as set theory, number theory, relations, and functions. Emphasis is placed on this theory as it relates to computer science and computer programming. Topics also include mathematical induction, recursive definitions, cardinality, and computability.

Distribution: GUR/MR

Offered: in the fall semester.

This course is a prerequisite.

Credit for both this course and MATH 281 is not permissible.

### **MATH 281 - Foundations of Mathematics I (3 cr.)**

Prerequisite: MATH 124 or MATH 134.

This course is an introduction to the foundational concepts necessary for the study of advanced mathematics. Topics include sets, logic, method of proof, mathematical induction, well ordering, relations, equivalence relations and functions. Emphasis will be placed on the deductive reasoning process and the writing of mathematical arguments.

Credit for both this course and MATH 251 is not permissible.

Distribution: GUR/MR

Offered: in the fall semester.

Changed from 4 cr. to 3 cr. in Fall'16.

Changed from 3 cr. to 4 cr. in Fall'13.

This course is a prerequisite.

Credit for both this course and MATH 251 is not permissible.

### **MATH 290 - Special Topics in Mathematics (1-3 cr.)**

Topics in mathematics that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

Distribution: GUR

### **MATH 302 - MTEL Prep (2 cr.)**

This course will provide additional resources to help prospective secondary mathematics teachers prepare for and pass the MTEL Mathematics test. The course will examine the content and structure of the test as well as identify topics requiring further focus and study. Both multiple choice and open-response questions similar to the official test will be used. Students and the professor will prepare and present solutions to the class.

Offered: on demand

### **MATH 306 - Linear Algebra (3 cr.)**

Prerequisite: MATH 124 or MATH 134 or MATH 251 or permission.

This course is the study of the topics and techniques of linear algebra. The topics covered in this course include systems of linear equations, matrices, determinants, vector spaces, linear transformations, eigenvalues and eigenvectors. Applications in many fields are discussed.

Distribution: MR

Offered: in the fall and spring semester.

### **MATH 310 - Theory of Interest (3 cr.)**

Prerequisite: MATH 134

An introduction to the fundamental theory and concepts of financial mathematics and how they are applied to calculate present and future values of various cash flows. Topics include simple and compound interest, annuities, loan amortization, bonds, rates of investment return, term structure of interest rates, duration, immunization, and interest rate swaps.

Offered: Fall semester

Formerly "Topics in Actuarial Science" 1-3 cr

### **MATH 331 - Computation in Statistics (3 cr.)**

Prerequisite: MATH 221 and MATH 306, and either CS 102, IT 102, CS 171, BIS 315, ENGR 105 or HONE 105

Students will learn computing skills essential in applied statistics. Topics will be presented using R or Python; LATEX (mathematical document preparation language); reproducible research; simulation methods (Monte Carlo studies, bootstrap, MCMC); statistical computing algorithms.

Offered: alternate Spring semesters

### **MATH 333 - Independent Study in Mathematics (1-3 cr.)**

See "Independent Study".

### **MATH 334 - Independent Study in Mathematics (1-3 cr.)**

See "Independent Study".

### **MATH 350 - Vector Calculus and Fourier Series (3 cr.)**

Prerequisite: MATH 235 and MATH 236.

This course studies selected topics from vector calculus, line and surface integrals (including Theorems by Green, Gauss, and Stokes), Fourier series, and Fourier series solutions to the linear one-dimensional wave equation.

Distribution: MR

Offered: in the fall semester and in the spring on demand.

formerly Engineering Analysis I

### **MATH 363 - Theory of Computation (3 cr.)**

Prerequisite: MATH 251 and either CS 200 or IT 200, or permission of the instructor.

This course is a study of the mathematical models and theory that form a foundation for computer science. Topics include the theory of formal languages and their applications to computation, finite state automata, regular expressions, context-free grammars, Turing machines, Chomsky's hierarchy and the theory of computability.

Distribution: MR

Offered: Spring semester

### **MATH 371 - Modern Aspects of Geometry (3 cr.)**

Prerequisite: MATH 251 or MATH 281, or permission.

This is an examination of various topics in geometry. Topics selected depend on the interests of the instructor and the needs of the students involved. Possible topics include finite geometries, Euclid's Elements (Book I), advanced topics in Euclidean geometry, Euclidean constructions and impossible constructions, transformations of the plane, non-Euclidean geometry, and projective geometry.

Distribution: MR

Offered: in alternate spring semesters.

### **MATH 372 - Probability (3 cr.)**

Corequisite: MATH 235 is a prerequisite or a co-requisite.

An introduction to probability at the calculus level. Topics include axioms of probability, basic combinatorics, conditional probability, independence, discrete and continuous random variables, expected value and variance, joint distributions, moment generating functions, laws of large numbers, and central limit theorem.

Offered: every spring semester

This course is a prerequisite.

### **MATH 375 - Creative Problem Solving (3 cr.)**

Prerequisite: MATH 251 or MATH 281, or permission.

The course will discuss creative problems from all areas of mathematics. Students will learn problem-solving techniques, will combine some of the seemingly disparate parts of their mathematics background, and will gain an appreciation of new areas of mathematics by looking at some of the fundamental questions that illustrate the key ideas. There will be emphasis on student presentation and analysis of solutions, and students will learn how to present mathematical arguments while developing their mathematical creativity.

Offered: alternate Spring semesters

### **MATH 377 - Elementary Number Theory (3 cr.)**

Prerequisite: MATH 251 or MATH 281, or permission.

This is the study of integers and their properties. The course provides an account of classical number theory as well as some of its historical background including divisibility, greatest common divisors, prime factorization, congruences, and theorems of Wilson, Fermat, and Euler. Time permitting, further topics may include multiplicative functions, primitive roots, and applications of the classical subject area in cryptography.

Distribution: MR

Offered: in alternate spring semesters.

### **MATH 378 - Combinatorics (3 cr.)**

Prerequisite: MATH 251 or MATH 281, or permission.

Combinatorics concerns the mathematical theory of counting. This course emphasizes enumeration, but existence and construction issues will also be discussed. Topics include basic principles of combinatorics, distributions, inclusion-exclusion, generating functions, Polya theory, combinatorial designs, and error-correcting codes. Further topics can be selected from: Fibonacci numbers, partially ordered sets, Ramsey theory, and applications to graph theory.

Offered: in alternate fall semesters.

### **MATH 379 - Graph Theory (3 cr.)**

Prerequisite: MATH 251 or MATH 281, or permission.

This is an introduction to graph theory and its applications through a modeling process. Topics include degrees, isomorphic graphs, trees, connectivity, traversability, matchings, planarity, coloring, digraphs, Ramsey Numbers, networks, and distance.

Offered: in alternate fall semesters.

### **MATH 383 - Mathematical Statistics (3 cr.)**

Prerequisite: MATH 372

This is a calculus-based course on the fundamental concepts of statistical theory. Topics include sampling distributions, order statistics, point estimation, interval estimation, hypothesis testing including Neyman-Pearson lemma, power function, goodness of fit tests and nonparametric tests.

Offered: in alternate fall semesters.

### **MATH 384 - Applied Regression & Time Series (3 cr.)**

Prerequisite: MATH 306 and MATH 383

A course in practical statistical methods with emphasis on data analysis and computation. Regression topics include simple and multiple linear regression, least squares, confidence intervals and hypothesis tests related to regression models, ANOVA, model selection, and diagnostics. Time series topics include time series modeling, estimation, and forecasting using ARMA models and ARIMA models.

Offered: in alternate spring semesters.

### **MATH 390 - Special Topics in Mathematics (1-3 cr.)**

Prerequisite: Junior standing and permission of the instructor.

Topics offered depend upon student interests as well as particular interests of instructors. The course is offered as often as faculty time and student interest permit. May be repeated for credit if topic differs.

### **MATH 401 - Actuarial Models I (3 cr.)**

Prerequisite: MATH 310 and MATH 372

The first course in a two-semester sequence covering models for single and multiple life contingencies. Topics include survival distributions, life insurance and annuities, premium calculation, present value random variables, and benefit reserves.

Offered: alternate fall semesters

### **MATH 402 - Actuarial Models II (3 cr.)**

Prerequisite: MATH 401

The second course in a two-semester sequence covering models for single and multiple life contingencies. Topics include multiple life and decrement models, expenses, individual and collective risk models, pensions, participating and universal life insurance, and reserves.

Offered: alternate Spring semesters

### **MATH 405 - Applied Stochastic Processes (3 cr.)**

Prerequisite: MATH 372

Corequisite: MATH 306 is a pre- or co-requisite

This course is an introduction to stochastic processes, beginning with a review of conditional expectations. Main topics include discrete Markov chains, Poisson processes, continuous-time Markov chains, and Brownian motion. Emphasis is on real-world applications of stochastic processes.

Offered: every other fall

### **MATH 406 - Mathematical Finance (3 cr.)**

Prerequisite: MATH 372

Corequisite: MATH 236 is a pre- or co-requisite

This is a course in the mathematical theory of financial risk management. The first part of the course is spent on developing both discrete and continuous models for ex-dividend stock price movements and portfolio management, pricing stock options (European, American and Exotic) by the CRR formula (discrete) or the Black-Scholes formula (continuous) or Monte-Carlo simulation and hedging risks by option greeks. The second part of the course is spent on mean-variance analysis for portfolio diversification, focusing on derivations of minimum variance portfolio, Capital Market Line and CAPM formula.

Offered: on demand

### **MATH 412 - Introduction to Topology (3 cr.)**

Prerequisite: MATH 251 or MATH 281, or permission.

This course covers introductory topics in the general theory of topological spaces. Topics include closed sets, closure, limit points, basic open sets, subspaces, continuity, homeomorphisms, product spaces, connectedness, compactness, and separation properties. There is an emphasis on writing formally correct mathematical proofs.

Offered: on demand.

### **MATH 418 - Introduction to Modern Algebra (3 cr.)**

Prerequisite: MATH 251 or MATH 281, or permission.

This course is an introduction to the axiomatic study of the algebraic structures of groups, rings, and fields. Topics include groups, subgroups, permutation groups, cosets, normal subgroups, group homomorphisms, factor groups, rings, subrings, polynomial rings, ideals, ring homomorphisms, factor rings, integral domains, fields, and the Fundamental Theorem of Algebra. There is an emphasis on writing formally correct mathematical proofs.

Distribution: MR

Offered: in the fall semesters.

### **MATH 420 - Mathematical Modeling (3 cr.)**

Prerequisite: MATH 236

This is an introduction to the construction and refinement of mathematical models. Techniques vary but typically include continuous modeling using differential equations as well as discrete modeling using linear programming and operations research. Applications may include models from population dynamics, environmental science, disease epidemiology, resource allocation, network flows, and financial planning.

Offered: on demand

### **MATH 421 - Real Analysis (3 cr.)**

Prerequisite: MATH 251 or MATH 281, or permission

This is an introduction to the rigorous treatment of analysis. Topics covered include the real number system, sequences, limits of functions, continuity, differentiation, integration, infinite series, sequences, and series of functions. There is emphasis on writing formally correct mathematical proofs.

Distribution: MR

Offered: in the spring semester.

### **MATH 427 - Complex Analysis (3 cr.)**

Prerequisite: MATH 235 or permission.

This is an introductory course in the theory of functions of a complex variable covering standard topics: the algebra and geometry of complex numbers, differentiation, integration, power series expansions, residues, and poles.

Offered: on demand.

### **MATH 441 - Data Visualization & Data Techniques (3 cr.)**

Prerequisite: MATH 221, and either CS/IT 102 or CS 171 or BIS 315 or ENGR 105/HONE 105.

Topics include common techniques for visualizing univariate and multivariate data, data summaries, and checking modeling

assumptions. Students will learn how to create, and interpret visualizations using the ggplot2 R package. Data techniques for obtaining and preparing data for visualization and further analysis will also be discussed. SQL in SAS and/or R will be introduced.

Distribution: MR

Offered: alternate Spring semesters

### **MATH 451 - Senior Project I (1 cr. )**

Prerequisite: Senior standing.

Senior students will work with a faculty member of their choice on a research topic of interest. At the end of the spring term, the student will submit a paper and give an oral presentation to the faculty in the Department of Mathematics and to his/her peers based on the research done over the course of two semesters.

Distribution: MR

Offered: fall semester.

### **MATH 452 - Senior Project II (2 cr. )**

Prerequisite: Senior standing.

Senior students will work with a faculty member of their choice on a research topic of interest. At the end of the spring term, the student will submit a paper and give an oral presentation to the faculty in the Department of Mathematics and to his/her peers based on the research done over the course of two semesters.

Distribution: MR

Offered: spring semester.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **MATH 461 - Undergraduate Research I (1 - 3 crs. )**

Prerequisite: MATH 251 or MATH 281, Junior or Senior standing and permission of the Chair.

This course offers qualified students the opportunity to conduct original research in the mathematical sciences under the supervision of a faculty member.

For details on the registration process, see the "Undergraduate Research" section of this Catalogue.

Distribution: MR

Offered: on demand

### **MATH 462 - Undergraduate Research II (1 - 3 crs. )**

Prerequisite: MATH 251 or MATH 281, Junior or Senior standing and permission of the Chair.

This course offers qualified students the opportunity to conduct original research in the mathematical sciences under the supervision of a faculty member.

For details on the registration process, see the "Undergraduate Research" section of this Catalogue.

Distribution: MR

Offered: on demand

### **MATH 463 - Undergraduate Research III (1 - 3 crs. )**

Prerequisite: MATH 251 or MATH 281, Junior or Senior standing and permission of the Chair.

This course offers qualified students the opportunity to conduct original research in the mathematical sciences under the supervision of a faculty member.

For details on the registration process, see the "Undergraduate Research" section of this Catalogue.

Distribution: MR

Offered: on demand

### **MATH 464 - Undergraduate Research IV (1 - 3 crs. )**

Prerequisite: MATH 251 or MATH 281, Junior or Senior standing and permission of the Chair.

This course offers qualified students the opportunity to conduct original research in the mathematical sciences under the supervision of a faculty member.

For details on the registration process, see the "Undergraduate Research" section of this Catalogue.

Distribution: MR

Offered: on demand

### **MATH 480 - Internship in Mathematics (1-3 cr.)**

See "Internships".

### **MATH 481 - Internship in Mathematics (1-3 cr.)**

See "Internships".

### **MATH 490 - Seminar (3 cr.)**

Prerequisite: Permission of the instructor.

Topics discussed depend upon the interest of the students. Seniors or unusually well qualified juniors may be admitted to the course only by permission of the department.

Offered: on demand.

### **MATH 491 - Special Topics in Mathematics (1-3 cr.)**

Prerequisite: Junior standing and permission of the instructor.

Topics offered depend upon student interests as well as particular interests of instructors. The course is offered as often as faculty time and student interest permit. May be repeated for credit if topic differs.

## **ME - MECHANICAL ENGINEERING**

### **ME 202 - Statics (3 cr.)**

Prerequisite: Complete MATH 134 with a minimum grade of "C", and PHYS 132 or PHYS 133.

Cross-Listed as: HONE 202

This course is designed both to teach problem-solving techniques and to provide students with the necessary background to take succeeding courses in solid mechanics. Students will become familiar with the analysis of two- and three-dimensional force systems using both scalar and vector techniques. These systems include frames, machines, trusses, and simple structures. Additionally, students will have the ability to draw free body diagrams and apply the principles of static equilibrium to both particles and rigid bodies and to analyze problems involving friction. Students will determine the centroids of

lines, areas and volumes and the moments of inertia of areas and masses using calculus and composite section methods. A project of a typical statics problem is required. The methods of assessing students include homework assignments, quizzes, examinations, projects, and a final exam.

### **ME 203 - Dynamics (3 cr.)**

Prerequisite: ME 202/HONE 202, MATH 236 or concurrently.

This course is designed to provide students with a clear understanding of the theory and applications of dynamics. The course depicts realistic situations encountered in engineering practice. Students will learn how to apply Newton's Second Law of Motion to study the effects caused by an unbalanced force acting on a particle; use the principle of work and energy to solve problems involving forces, displacements, and velocities; determine the power and efficiency of machines; solve problems involving impact of bodies; and analyze problems involving the planar kinematics and kinetics of rigid bodies. A project of a typical dynamics problem is required. The methods of assessing students include homework assignments, quizzes, examinations, projects, and a final exam.

### **ME 205 - Measurement Computing (2 cr.)**

Prerequisite: ENGR 105/HONE 105 and PHYS 134.

This introductory and hands-on experience course is offered to all students who have some knowledge or experience in programming. Concept of event driven programming is introduced during class lectures while its applications to data collection and analysis are demonstrated during laboratory sessions. Students will learn how to use Object Oriented programming capabilities of Microsoft Visual BASIC to develop true 32-bit applications for data acquisition and control, which can run under Microsoft Windows 32-bit platforms. Practical application exercises related to data acquisition and control, database management, and analysis will be selected from the fields of engineering. There will be one 75-minute laboratory exercise every week where students will practice designing user interfaces, debugging codes, and running programs and interfacing transducers to PC. Computer projects will be assigned. The method of assessing student learning will include computer assignments, performance during laboratory sessions, and quizzes. One class hour and 1.5 laboratory hours.

Distribution: MR

### **ME 208 - Mechanics of Materials (3 cr.)**

Prerequisite: ME 202/HONE 202. Co-req or prereq: MATH 235

Corequisite: MATH 235.

This introductory course is offered to both Mechanical Engineering majors and nonmajors and is designed to increase the students' awareness of the static behavior of deformable bodies and to provide them with the necessary background to take advanced courses in solid mechanics. Students will determine pertinent mechanical properties of materials from stress-strain diagrams; analyze statically indeterminate members; analyze the effect of temperature change in members; determine the state of stress and strain at a point resulting from uniaxial, biaxial, and triaxial loading; determine stresses and displacements in axially, flexurally, and torsionally loaded members; determine the stresses in thin-walled pressure vessels; determine the principal stresses, the maximum in-plane shear stresses, and the absolute maximum shear stress in members subjected to combined loadings; and determine the critical stress in ideal columns subjected to various types of supports. An individual written report analyzing an aspect of mechanics of materials and a group project involving design, building, and testing are required. The methods of assessing

students include homework assignments, quizzes, examinations, projects, and a final exam.

Distribution: MR

### **ME 303 - Thermodynamics I (3 cr.)**

Prerequisite: CHEM 105 and MATH 235.

This introductory course is offered to both Mechanical Engineering majors and non-majors and is intended to familiarize students with the fundamental concept of the first and second law of thermodynamics. Students will learn how to determine the thermodynamic properties of real and ideal substances by using thermodynamic property tables and mathematical relationships. The concepts of energy, heat, work, entropy, reversible, and irreversible processes are introduced and applied to real engineering systems and thermodynamic cycles. Students are expected to use software packages to perform the assigned computer projects. Quizzes, homework assignments, a midterm, and a final exam will be used to assess a student's performance.

Distribution: MR

### **ME 304 - Thermodynamics II (3 cr.)**

Prerequisite: ME 303.

This intermediate course is offered to Mechanical Engineering majors and nonmajors and is designed to teach thermodynamic analysis of various power and refrigeration cycles. The first and second law analyses of the Carnot, Rankine, Otto, Diesel, Brayton, Sterling, and Ericsson cycles will be studied. Reheating and regeneration concepts will be discussed and applied to the Rankine cycle. Maxwell relations are used to establish relationships among thermodynamic properties. Students learn how to analyze nonreactive ideal gases such as the air-water vapor mixture. Each student is expected to work on an independent design project dealing with power or refrigeration systems and submit a final written report. The method of assessing students includes homework assignments, quizzes, exams, computer projects, and a design project.

Distribution: MR

### **ME 309 - Materials Science (3 cr.)**

Prerequisite: CHEM 105 and PHYS 134.

This course introduces the fundamental concepts of material science and engineering. Students are provided with information concerning the interrelationship between the microstructure of a material, its properties, and its processing. The analysis of mechanical properties, the manufacturing process, the material specifications for a selected application or component, and the advantages and limitations of the selected material are presented. Major topics include: material selection, crystallographic structure, diffusion, solidification, phase diagrams, microstructure, and mechanical properties of different classes of materials. The course is presented in a series of classroom lectures, selected videos, case studies, and independent investigations. A project and a technical poster presentation are required. The methods of assessing students include quizzes, exams, homework assignments, and applications of principles to case studies.

Distribution: MR

### **ME 311 - Mechatronics (3 cr.)**

Prerequisite: ME 203, and ME 205 or permission of instructor.

Mechatronics is the synergistic integration of mechanism, electronics, computer control, and information technology to achieve a functional system. This course centers around the modeling and analysis of the

basic hardware and software components of PC-based data acquisition and control, and electro-mechanical systems including sensors, actuators, signal processing, microcontrollers, mechanisms, and PID motion controls. Hands-on experience of the applications and programming of simple mechatronic systems is provided. The method of assessing students includes quizzes, homework assignments, exams, and laboratory reports.

Distribution: MR

### **ME 313 - Mechanical Laboratory I (2 cr.)**

Prerequisite: ME 203 or concurrent, ME 208 or concurrent; or permission of the ME laboratory coordinator.

This course is the first in a three-course sequence designed to give students hands-on experience in the use of laboratory instruments and in the collection and interpretation of data. Experimental methodology and communication of experimental results are stressed throughout the course. The course also serves to enhance the technical writing skills of the student. A student works in a team to perform laboratory experiments in dynamics, mechanics of materials, measurement techniques, data acquisition, and manufacturing. A written report or technical memorandum is submitted either by each student or by the group. The assessment is based upon the quality of both the writing and engineering content of the written reports.

Distribution: MR

One class hour, one three-hour lab.

### **ME 314 - Mechanical Laboratory II (2 cr.)**

Prerequisite: ME 303; ME 313; ME 316 or concurrently; or permission of the ME Lab Coordinator.

This course, the second in a three-course sequence, builds on the skills developed in ME 313. Experimental methodology and communication of experimental results are also stressed throughout this course. A student works in a team to perform laboratory experiments in material science, mechanics of materials, fluid mechanics, alternative energy, data acquisition, SPC and manufacturing. A written report or technical memorandum is submitted either by each student or by the group. Additionally, each student works on an interdisciplinary team design project under the supervision of faculty project advisors. Periodic written progress reports and a final written report are submitted. A final oral report is presented before an assembly of faculty and students. The assessment is based upon the quality of both the writing and engineering content of the written reports.

Distribution: MR

### **ME 316 - Fluid Mechanics (3 cr.)**

Prerequisite: ME 203, and ME 303 or permission of instructor.

This introductory course is offered to both mechanical engineering majors and nonmajors and is designed to provide students with the background and tools required to develop a physical feel for the phenomenon of fluid motion, to develop practical methodologies for the solution of engineering flow problems encountered in modern technology, and to prepare students to enter professional practice. Students become familiar with pressure measurement; hydrostatic forces on submerged surfaces; developing and using the continuity, momentum, and energy equations; dimensional analysis and dynamic similitude; analysis of flow in closed conduits; calculating the drag force on various two- and three-dimensional bodies; and understanding boundary layer theory, model testing, and fluid measurement techniques. A team design project involving a typical fluid dynamics problem is required. The methods of assessing

students include homework assignments, quizzes, examinations, projects, and a final exam.

Distribution: MR

### **ME 318 - Design of Solar Energy Systems (3 cr.)**

Prerequisite: ME 303.

This course is an introduction to the theory and application of various solar energy systems, including principles of solar energy collection, conversion, storage, and distribution. Topics such as solar air and water heating and cooling applications, their components and systems in addition to Passive solar strategies and concepts are also highlighted in this course. The course aims at enhancing the students understanding on solar energy availability, collection, and potential utilization of solar energy in improving the indoor environmental quality of built-up spaces. A project involving the design of an energy independent home is required. The methods of assessing students will include homework, quizzes, examinations, classroom discussions, design projects, and a final exam. 3 class hours.

Distribution: MR

### **ME 320 - Mechanical Vibrations (3 cr.)**

Prerequisite: ME 203 or ME 207; ME 208; MATH 350.

This course is an introductory treatment of vibrating systems. Students learn to analyze both free and forced, undamped and damped, single degree-of-freedom systems using both equilibrium and energy methods. The method of mass and spring equivalence as applied to both translational and rotational systems is also presented. The study of the response of rotating machinery, dynamic transmissibility, and vibration isolation systems subject to sinusoidal inputs are included. Students learn mathematical methods of analyzing nonsinusoidal inputs using Fourier series; Fourier transforms and convolution methods are introduced to solve two degree-of-freedom systems using matrix methods and to apply the technique to the design of a vibration absorber. An introduction to continuous systems using Rayleigh's and other approximate numerical methods are made. The means of assessing students include homework assignments, quizzes, in-class exams, and a comprehensive final exam.

Distribution: MR

### **ME 322 - Manufacturing Processes (3 cr.)**

Prerequisite: Junior or Senior standing in Engineering

This is an introductory course that introduces the fundamentals of a variety of manufacturing processes. Students will focus on both the theoretical and practical aspects of manufacturing processes and materials selection while receiving an introduction to the language of manufacturing. The student will learn to design, analyze, and control each manufacturing process, and quantify its capabilities, typical applications and its advantages and limitations. The topics highlighted in this course are: material selection, metrology, and quality control, casting, forming, material removal, joining, heat treating, and the integration of these techniques into a manufacturing system. The course is presented in a series of classroom lectures, selected videos, case studies, and laboratory experiments which provide students with hands on manufacturing experience. Each student will be assessed by their performance on quizzes, exams, homework assignments, and applications of the learned principles to case studies and laboratory experiments.

Distribution: MR

### **ME 324 - Design of Mechatronic Systems (3 cr.)**



Prerequisite: ME 311

Mechatronics is a modern discipline that transcends the boundaries between Mechanical, Electrical, Computer Engineering, and Information Technology. It is defined as the science of intelligent and integrated systems in which engineers integrate mechanical, electrical and computer engineering to design, develop, fabricate and test complex automated systems. The evolution of this area is particularly a consequence of the tremendous growth in the area of computers, intelligent sensors, electronic signal conditioners, PC and PLC-based controllers. Because of the emphasis upon system integration, this course will center on system integration with practical industrial applications. This intermediate, cross-discipline, project-based course which is offered to mechanical engineering juniors provides a real-life experience related to the practice of mechatronics engineering. Students will continue using their knowledge and skill of Visual Basic.NET or LabView in conjunction with an off the shelf A/D board to develop Human Machine Interface (HMI) and collection and analysis routines. Finally, student will be introduced to the design and applications of relational database management systems using MySQL or Microsoft SQL servers.

Distribution: MR

### **ME 333 - Independent Study in Mechanical Engineering (3 cr.)**

See "Independent Study"

Distribution: MR

### **ME 334 - Independent Study in Mechanical Engineering (3 cr.)**

See "Independent Study"

Distribution: MR

### **ME 415 - Wind/Water Turbine Fundamentals (3 cr.)**

Prerequisite: ME 303 and ME 316.

This course introduces wind and water turbines for power generation, with a focus on current Horizontal Axis Wind Turbines (HAWT). Fluid machinery design concepts are developed which include: lift/drag mechanism, control volume theory, Euler's pump equation and fluid machinery similitude. Application of control volume theory to wind and water turbine design and optimization is formulated, and applied to several case studies. The Betz limit and current HAWT wind turbine aerodynamic limitations are formulated. Key mechanical and electrical components are studied with a focus on overall system performance. New and novel wind/water turbine concepts are discussed and analyzed.

Distribution: MR

### **ME 417 - Heat Transfer (3 cr.)**

Prerequisite: ME 303 and ME 316.

This senior level course is offered to both Mechanical Engineering majors and nonmajors and is designed to convey the basic principles of heat transfer by incorporating a broad range of engineering applications. Students will use conduction, convection, and radiation equations to determine heat transfer rates over and through plane, cylindrical, and spherical surfaces; determine the optimum thickness of insulation; analyze the effect of heat generation on temperature distribution and heat rate; determine the performance of extended surfaces; calculate the temperature distribution and evaluate the heat rate for two-dimensional steady-state conduction; determine the temperature and heat transfer rate for one-dimensional and

multidimensional transient conduction; determine the heat transfer rate over a cylinder, sphere, noncircular cylinders, and on a tube bank in the cross-flow of a gas; and perform engineering calculations that involve energy balance and appropriate convection correlations for internal flows and radiation exchange between surfaces. A team project involving a heat transfer experiment and design of cooling fins for a leaded cylindrical wall is required. The methods of assessing students include homework assignments, quizzes, examinations, projects, and a final exam.

Distribution: MR

### **ME 419 - Experimental and Analytical Stress Analysis (3 cr.)**

Prerequisite: ME 208; MATH 350; ME 435 or concurrently.

This senior level course builds on the material presented in ME 208 and develops the students' ability to apply the principles of advanced mechanics of materials to problem solving while applying common experimental techniques for solution verification. The analytic studies will involve the study of three-dimensional states of stress and strain, unsymmetric bending of beams; stresses and deflections of curved beams and beams on elastic foundations; deflection and slope in beams using Castigliano's theorem; and stresses in thick walled cylinders. The experimental studies include the basic theory and installation techniques of electric resistance strain gauges, photoelastic coatings, and applications of load and deflection measuring techniques. Applications of these techniques in the verification of analytical solutions is emphasized throughout the course. Methods of assessing students include homework assignments, laboratory reports, quizzes, a midterm, and a comprehensive final exam.

### **ME 420 - Wind/Water Turbine Aerodynamic Design (3 cr.)**

Prerequisite: ME 415 and ME 316.

This course applies control volume theory, Euler's fluid machinery equation and fluid dynamic similitude to the aerodynamic design of wind and water turbines. Control volume theory is used to generate turbine performance goals and realistic design constraints. Key aerodynamic relationships for wind/water turbine concepts are formulated and applied to real wind turbine applications. Both turbine cascade theory and turbine blade element theory are developed. Cascade theory applications include turbine performance estimates using available predictions and the use of fluid dynamic similitude. Blade element theory includes turbine blade design using airfoil lift/drag polars. Blade solidity and rotational speed are investigated for optimum performance.

### **ME 421 - Green Engineering: Materials Selection in the Life Cycle Design Process (3 cr.)**

Prerequisite: ME 208 and ME 309.

There exists an enormous range of materials available to the engineer. This course is intended to provide the student with an understanding of the rationale for selecting specific materials for use in applications that range from aerospace, energy and the environment to medical and transportation. The basis of the course is to help the student strategically think about matching the material to the design of a successful product. In all good design, the strategy requires that we define the function of the object, the constraints that are not negotiable, define the objectives of the application, and ultimately consider the free variables. The free variable in well-designed products is frequently the material selection. This course considers

materials selection on the basis of materials properties as controlled by processing and the resulting structure.

### **ME 422 - Control Systems (3 cr.)**

Prerequisite: MATH 350 and ME 203.

This is an introductory course in the analysis and design of controls for mechanical systems. Students learn to apply advanced mathematical procedures such as matrix algebra, complex variables, and Laplace transforms to model both mechanical and control systems. Control system representation and performance are studied. Students learn methods of modeling and testing systems for stability, time domain analysis and design specifications, frequency response, and feedback characteristics. Computer application and modeling are used extensively in the course. Several computer projects are assigned. The method of assessing students includes class participation, homework, examinations, projects, and a final exam.

### **ME 423 - Product Development and Innovation (3 cr.)**

Prerequisite: Senior standing in Engineering.

Cross-Listed as: BME 423/BME 471 and BUS 423

This course will cover new product innovation from both an entrepreneurship and intrapreneurship perspective. Students will learn about generating and identifying business opportunities, assessing concept ideas from technical, market, and financial perspectives; designing and developing new products; testing prototypes from technical and market perspectives; and developing a marketing plan including launch, monitoring, and measurement provisions. Interdisciplinary teams of business and engineering students will apply these principles to develop product concepts, prototype products, final designs, and marketing plans for a new consumer or business product. The final designs and plans will be presented to an expert panel of business executives, investors, and faculty.

Cannot receive credit for taking BME 423/BME 471 and BUS 423.

### **ME 425 - Design of Machine Elements (3 cr.)**

Prerequisite: ME 208 and ME 309, or BME 240 and BME 351.

This senior level course is designed to introduce students to the methodologies involved in the analysis and design of simple machine parts. The impacts of social, economic, and material constraints on the design process are also considered. Students use failure theories to determine the state of stress in members made of ductile or brittle materials subjected to either steady, alternating, or combined steady and alternating stresses; construct fatigue diagrams and fatigue failure curves; and use Miner's Equation to analyze the state of stress in materials subjected to various loading cycles. Topics include the design of circular and noncircular shafts subjected to steady and fluctuating loads, the determination of the characteristics of clutches and brakes to satisfy operating conditions; the specification of springs subjected to either steady or fluctuating loads to satisfy design specifications; and the specification of threaded fasteners. A project involving the design of machine elements is required. The method of assessing students includes homework assignments, quizzes, examinations, and projects.

Distribution: MR

### **ME 426 - Gas Dynamics (3 cr.)**

Prerequisite: ME 303, ME 316, and senior standing.

Cross-Listed as: ME 526

This course introduces students to the analysis and design procedures currently used for solving engineering problems in compressible fluid

flow. Students learn how to combine the concepts of dynamics, thermodynamics, and fluid mechanics to generate useful analyses for the design of fluid machinery. Students use control volume theory and several derived compressible flow analyses to develop design procedures for wind tunnels, exhaust pipe tuning, aircraft inlets and nozzles, shock tubes, and gas turbines. Several case studies encompassing contemporary design problems from industry are used in the classroom to enhance the learning process. An individual design project using these methods is assigned. The method of assessing students includes classroom participation, homework assignments, examinations, and a final exam.

### **ME 427 - Kinematics and Control of Electro-Mechanical Systems (3 cr.)**

Prerequisite: ME 203 and EE 205/HONE 205

This is an introductory level course in electric drive systems. Advances in power electronics has permitted the development of adjustable-speed drives which provide significant performance and efficiency improvements in such areas as pumps and compressors, precision motion control in automated factories, wind-electric systems in generating electricity, and hybrid-electric vehicles, to name a few. To understand what a variable-speed drive is and how it works we will study such things as mechanical models related to rotating machines, review of associated electric circuits' theory, overview of electric converter operation, electro-mechanical energy conversion principles, and what needs to be considered in controlling the various types of electrical machines available to us. Successful completion of this course should provide the student with a strong background at the systems integration level of electric drives. Methods of assessment include homework, quizzes, and tests.

Formerly "Systems Engineering"

### **ME 430 - Metrology: The Science of Measurement (3 cr.)**

Prerequisite: Senior standing in Biomedical, Industrial, or Mechanical Engineering.

This course is an introduction to the fundamentals of metrology, the science of measurement. Students will be introduced to real-world applications in topical areas including process certification, conventional and advanced inspection tools and techniques, gage repeatability and reproducibility (Gage RR), and re-engineering techniques of precision machine components using Faro Arm, White Light, Coordinate Measurement Machines (CMM), and Non-Contact Lasers. This course provides students with the ability to make judgments regarding the proper selection and usage of metrology tools and processes for advanced measurement techniques. It also, facilitates the application of metrology skills to advanced project work in the engineering curricula, as well as to the needs and practices of industry. The methods of assessing students include homework, quizzes, examinations, classroom discussions, hands-on laboratories, and a final exam.

### **ME 437 - Design Projects (3 cr.)**

Corequisite: ME 439.

Selected students work on an independent design project in the semester prior to enrolling in ME 440. This course is intended to provide students with the opportunity for a two-semester project sequence with ME 440. See description for ME 440.

Distribution: MR

**ME 439 - Professional Awareness (1 cr.)**

Prerequisite: Senior standing.

This course is designed to make students aware of some of the problems, concerns, and responsibilities of an engineer as a professional. In addition, students are guided in formulating a proposal for a Senior Design Project in preparation for project work in ME 440. Students participate in discussions, led by invited speakers, on topics that enable them to write a professional résumé, interview for a job, generate an effective and substantive report, and make an effective technical oral presentation. Students are exposed to ethical issues in engineering environments; made aware of the necessity of protecting their work with either patents, copyrights, trademarks, and trade secrets and of not infringing on the similar rights of others; and apprised of issues of safety in the work place, product liability, and the importance of professional registration. Faculty and representatives from industry present ideas for Senior Design Projects and each student chooses a project and develops and writes a project proposal under the supervision and guidance of a faculty advisor. The assessment in this course is based on students' participation in discussions, the submission of short papers on some of the issues raised in the presentations, and the quality of the project proposal and oral presentation. One class hour.

Distribution: MR

**ME 440 - Senior Design Projects (3 cr.)**

Prerequisite: ME 439 and graduating senior status.

This is a capstone design course that prepares students for entry-level positions. In this course, each student works on an independent engineering project under the supervision of a faculty advisor. Students apply the design process and communicate the results of their project work in both an oral and written form. Oral reports are presented before an assembly of faculty and students. Students apply engineering design principles either by working on a product, improving a product, or designing experiments to investigate causes of either an observed phenomenon or a problem in engineering. Students are required to demonstrate their achievements using appropriate laboratory exhibits. Students who select industry-sponsored projects have the opportunity of working with the industrial advisor in an actual engineering environment. The assessment in this course is based on the students' level of commitment demonstrated throughout the semester, the level of achievement attained in the project, the recording of activities in a log book, and the quality of the written report and oral presentation. Meeting hours by arrangement.

Distribution: MR

**ME 444 - Computer Applications in Mechanical Engineering (3 cr.)**

Prerequisite: ME 417 or concurrently; and senior standing.

This advanced course is offered to Mechanical Engineering majors. Students learn to use computational methods and numerical techniques in conjunction with spreadsheet packages to solve practical engineering problems encountered in solid mechanics, fluid mechanics, heat transfer, dynamics, machine design, measurements, and vibrations. The development of computer algorithms/macros for either design or analysis is also emphasized. Students use case studies to investigate problems requiring a multidisciplinary approach. A total of 10 computer projects will be assigned. Each student is expected to work on two independent design projects and submit a final written report for each project. The methods of assessing students include computer assignments and the design projects.

**ME 445 - Design of Alternative Energy Systems (3 cr.)**

Prerequisite: ME 303, ME 316, and ME 417 or concurrently.

This course is an introduction to the theory and application of various alternative energy systems, including solar, wind, fuel cells, geothermal, and ocean waves. Students will become familiar with calculating the thermal performance of various alternative energy systems, and learn the various limitations and practical examples where each is used. A project involving the design of an energy independent home is assigned. The methods of assessing students include homework, quizzes, examinations, classroom discussions, a design project, and a final exam.

**ME 447 - Fundamentals of Flight (3 cr.)**

Prerequisite: ME 203, ME 303 or concurrently, and ME 316 or concurrently, or permission of instructor.

This course is an introduction to the fundamentals of flight, with a focus on engineering aspects of flight. Topics include basic aerodynamics of sub-sonic flight, airfoil and wing design, airplane performance at various flight attitudes and conditions, aircraft stability and control, airplane systems and instruments, airport and flight environments, navigation, and aviation weather. Basic wind tunnel experiments and a flight simulator are also used to demonstrate the concepts covered during classroom sessions. The methods of assessing students include homework, quizzes, examinations, classroom discussions, a team-based aerodynamic design project, and a final exam.

**ME 449 - Computer-Aided Engineering (3 cr.)**

Prerequisite: ME 208, and ME 417 or concurrently

This course is offered to all engineering majors. Students learn the fundamentals of conceptual design and engineering analysis/simulation. Computer hardware and software required to perform solid modeling and finite element analysis are presented. Commercial software packages such as SDRC Master Series and Fluent are used during the laboratory sessions to provide students with hands-on experience related to the concepts learned during class lectures. Students will use these commercial tools to generate solid models and import the geometry into the simulation module to perform finite element analysis or design optimization. Each student will complete 14 solid modeling and finite element assignments outside of the class and laboratory periods. Additionally, each student will work on an independent design project and submit a final written report. The methods of assessing students include computer assignments, performance during laboratory sessions, and the design project. One class hour and three hours lab.

Distribution: MR

**ME 455 - Applications of Mechatronic Systems (3 cr.)**

Prerequisite: ME 311 and ME 324

Cross-Listed as: ME 656

This advanced course is intended to equip students with an in-depth knowledge and understanding of key mechatronic concepts and their applications to the robust design of mechatronic products and systems for consumers and industry. Core aspects are combined with practical industrial applications and are presented in an optimal way for understanding. A collection of case studies drawn from a variety of industries (complete with parts, lists, setup, and instructions) are used to support the mechatronics design methodology.

This course which builds on the skills introduced in ME 311 and ME 324 will help students to deepen their knowledge of system integration and Mechatronics system design process. It also develops

concepts related to robotics applications, plus advanced topics of mechatronic system design like design for testing and fault-tolerant design. The course, like ME 324, also provides a real life experience related to the practice of mechatronics engineering.

### **ME 460 - Noise Control and Engineering Acoustics (3 cr.)**

Prerequisite: Junior or senior standing in Engineering.

Noise has become a major factor in influencing the marketability and competitiveness of industrial products such as cars and washing machines. In addition many products are required to satisfy strict legal and regulatory noise limits, e.g. aircraft take off noise. This course introduces to engineering students the fundamentals of acoustics, vibrations, and noise control. It then uses these principles in designing effective noise-control solutions to common engineering problems. Students will learn the effects of noise on people. Students will perform several laboratory and field experiments. Several case studies encompassing contemporary design problems from industry are used in the classroom to enhance the learning process. An individual design project using these methods is assigned. The method of assessing students includes classroom participation, homework assignments, examinations, and a final exam.

### **ME 466 - Applied Computational Fluid Dynamics (3 cr.)**

Prerequisite: ME 304 and ME 316.

This is a study of fluid machinery design. Topics include boundary layer theory; procedures for analyzing fluid flow losses; compressible flow effects; design concepts and analyses for airfoils, airfoil cascades, compressors, and turbines; model testing and evaluation; and introduction to gas turbine analysis and design. A design project involving the use of analytical and experimental methods is required. The methods of assessing students include homework, quizzes, examinations, classroom discussions, a design project, and a final exam.

### **ME 480 - Internship in Mechanical Engineering (3 cr.)**

See "Internships".

### **ME 482 - Mechanical Engineering Research (1-3 cr.)**

Prerequisite: Junior or Senior Standing

See Undergraduate Research

Variable credits 1-3 cr.

### **ME 490 - Special Topics in Mechanical Engineering (3 cr.)**

A study of an advanced topic in engineering of special interest to mechanical engineering majors.

## **METR - METEOROLOGY**

### **METR 101 - Introductory Meteorology (3 cr.)**

This is an introductory course in meteorology for the non-technical student. Topics include the earth-sun system, the earth's atmosphere, the earth's heat budget, weather measurements, clouds, horizontal air movement, stability, fronts, short-term weather forecasting, and climate. Two class hours, three-hour lab.

Laboratory fee \$100.

### **METR 151 - Climate Change (3 cr.)**

Prerequisite: One of the following: PHYS 101, PHYS 103, PHYS 105, PHYS 123, PHYS 133, CHEM 101, CHEM 103, CHEM 105, BIO 101, METR 101, or GEOL 101

Cross-Listed as: ILP 236

This course will first address the physical laws and underpinnings of the observed global warming trend. Changes in the atmospheric abundance of greenhouse gases and aerosols and in land surface properties, that alter the energy balance of the climatic system and the preexisting greenhouse effect, will be investigated. Model projections for future climates will be discussed. The investigation of the physical science basis will be followed by an assessment of the observed and projected global and local impacts of the climatic changes and the adaptations and vulnerabilities of natural, social, and economic systems impacted by these changes. Finally the proposed political solutions addressing these threads, (local and global) especially as expressed and outlined in the Assessment Reports of the Intergovernmental Panel on Climate Change (IPCC) a panel under the joint auspices of the United Nations and the World Meteorological Organization will be discussed. (NSP)

## **MK - MARKETING**

### **MK 200 - Principles of Marketing (3 cr.)**

Prerequisite: Sophomore standing.

Cross-Listed as: HONB 200

Principles of Marketing (MK 200) is an exploration of the role of marketing both within the firm and within society. This course examines customer value, identification of opportunities to create customer value, and creation of an integrated marketing strategy appropriate for an identified opportunity to create customer value.

Distribution: BUSR/MR

Offered: fall and spring semesters.

This course is a prerequisite.

### **MK 302 - Market Analysis (3 cr.)**

Prerequisite: MK 200/HONB 200

In this course students apply marketing concepts to identify and understand gaps in the marketplace, to analyze and understand potential opportunities, to vet those opportunities, and to present their findings to decision makers.

Distribution: MR

Offered: in the fall and spring semesters.

### **MK 303 - Customer Solutions (3 cr.)**

Prerequisite: MK 302

Building on the market analysis skills learned in MK 302, students will more completely develop customer solutions in this course. This includes development of appropriate customer solutions and realistic revenue models within a marketing strategic framework. Analysis, evaluation, recommendation and rationale for the most promising option require analytic and professional communication skills.

Distribution: MR

Offered: in the fall and spring semesters.

### **MK 311 - Multinational Marketing (3 cr.)**

Prerequisite: Junior standing and MK 200/HONB 200.

This course is an introduction to the complexities and implications of foreign markets, the contemporary environment, problems, and practices in international and global marketing. Emphasis is on decision-making and policy formulation including demographic, cultural, economic, political, legal, technological, logistical, and competitive aspects of doing business outside the home country.

Offered: Fall and Spring

Formerly MK 411

### **MK 318 - Marketing Research (3 cr.)**

Prerequisite: MK 200/HONB 200 and BIS 221

This course is a study of the quantitative and qualitative techniques of marketing research and their effective use in marketing management. The course emphasizes the flow of marketing information, the development of sound primary research, and the adaptation of research tools to management planning and decision making.

Distribution: MR

Offered: Fall

### **MK 319 - Marketing Analytics (3 cr.)**

Prerequisite: MK 200/HONB 200, and BIS 221 or MATH 120

This course will help develop the student's analytical mindset. Students will explore secondary datasets using different analytical approaches to answer important marketing questions related to buyer personas, forecasting, purchase behavior, and segmentation. The focus is the development of the data translator, who plays a critical role in the communication of analytical results throughout the firm. This is one of three courses that can fulfill the marketing research requirement.

Distribution: MR

Offered: spring

### **MK 320 - Price and Product Strategy (3 cr.)**

Prerequisite: EC 111 or EC 112, BIS 221, and MK 301.

Marketing is about the exchange process of products and services for monetary consideration between buyers and sellers. This course examines the creative and management processes, approaches, and analytical tools and techniques involved in creating products/services and setting the prices for them. The teaching pedagogy employs interdisciplinary student teams that identify customer needs and create product/service design and pricing solutions for them. While the major focus will be on the development and pricing of new products, other product and pricing issues such as product life cycle, product development and pricing, product line pricing, branding, and price-quality relationship will be covered.

Distribution: MR

Offered: in the spring semester.

### **MK 322 - Sales and Sales Management (3 cr.)**

Prerequisite: MK 302 or PHARB 200

This course is an examination of the role of personal selling in the marketing mix. Planning, training, organizing, forecasting, and reporting of individual sales personnel and group sales activities are emphasized.

Offered: in the spring semester.

### **MK 323 - Distribution Strategy (3 cr.)**

Prerequisite: MK 302

This course examines channels of distribution as organizational networks that create value for the customer through the generation of possession, time, and place utilities. The approach will be both strategic and managerial-strategic in the sense that marketing channels are value adding chains that create competitive advantage, managerial in the sense that channels must be designed, developed, and maintained as the marketing environment changes.

Distribution: MR

Offered: in the fall semester.

### **MK 333 - Independent Study in Marketing (3 cr.)**

See "Independent Study".

### **MK 334 - Independent Study in Marketing (3 cr.)**

See "Independent Study".

### **MK 340 - Promotion Design and Applications (3 cr.)**

Prerequisite: MK 200/HONB 200 and junior standing

This is a course designed to give students experience applying promotions and graphic design theory to the development of promotional materials such as print advertisements, sales support materials, newsletters, flyers, logo design, business communication materials, and web pages. Students will be introduced to graphic design computer software used for creating marketing and sales materials.

Offered: in the fall and spring semesters.

### **MK 372 - Digital Media Marketing Strategies (3 cr.)**

Prerequisite: MK 200

This course investigates the dynamic topic of digital media marketing, the technological innovation that has changed the way businesses market themselves in a digital world. An overview of digital media marketing and the development of digital media marketing strategy will be the primary focus of the course. Additional topics include new technologies in digital media marketing, the evaluation of digital media marketing promotional tools, and the implementation of digital media marketing campaigns. This course will help students to gain a better understanding of the value of digital media marketing as a viable and often times necessary marketing resource.

Formerly "Social Media Marketing"

### **MK 390 - Special Topics in Marketing (3 cr.)**

This course is a study of advanced topics in marketing of special interest to marketing or marketing communication/advertising majors, but not carried in the catalog on a regular basis.

Distribution: MR

### **MK 423 - Applied Marketing Capstone (3 cr.)**

Prerequisite: MK 303

Students will apply the marketing value creation process through a client-based practicum.

Distribution: MR

Offered: Spring

**MK 480 - Internship In Marketing (3 cr.)**

See "Internships".

Distribution: MR

credit change Fall'22 to 3 crs

**MK 481 - Internship in Marketing (1-3 cr.)**

See "Internships".

Distribution: MR

**MK 485 - Marketing Communication/Advertising Internship (3 cr.)**

Prerequisite: Marketing Communication/Advertising majors.

See "Internships".

**MK 486 - Marketing Communication/Advertising Internship (1 - 3 cr.)**

Prerequisite: Junior or Senior Standing, and Marketing Communication/Advertising majors.

See "Internships".

credit change Fall'22 to 1 - 3 crs

**ML - MILITARY LEADERSHIP****ML 100 - Introduction to Army Physical Fitness (1 cr.)**

This course is based on the Army Physical Fitness Training Program. It is designed to introduce students to the ethos and approach to fitness within the military and to augment their training as future leaders if they choose to pursue a commission in the United States Army. This course is open to all students.

**ML 101 - Foundations of Officership (1 cr.)**

This is an introduction to basic leader and officer competencies to establish a foundation for continued study. Learn basic life skills pertaining to personal fitness, time management, and interpersonal communication. Includes introduction of Army values and expected ethical behavior. Presents the unique duties and responsibilities of officers and the expectation of selfless service.

**ML 102 - Basic Leadership (1 cr.)**

This is an introduction of a generic model of problem-solving; instruction in basic skills that underlie effective problem-solving; relate the problem-solving model and basic skills to the resolution of military problems. Fundamental leadership concepts are introduced including factors that influence leader and group effectiveness.

**ML 201 - Individual Leadership Studies (2 cr.)**

This course emphasizes development of problem-solving and critical thinking skills through experiential learning activities. Application of effective written and oral communication, feedback, and conflict resolution skills.

**ML 202 - Leadership and Teamwork (2 cr.)**

This course focuses on self-development guided by knowledge of self and group processes. Experiential learning activities are designed to challenge current beliefs, knowledge, and skills.

**ML 301 - Military Leadership I (3 cr.)**

Overview of military leadership at a hands-on tactical level and theoretical level. Tactical leadership phase: focus on the small unit leader and skills required for successful leadership of unit from a fire team through platoon level. Theoretical leadership phase: focus on basic leadership principles, communication concepts, and motivation theory.

**ML 302 - Military Leadership II (3 cr.)**

This is an introduction to military leadership and management. Development of practical managerial/leadership skills in planning, organizing, delegation, and control and development of instructor skills through instruction training, performance-orientated training, and individual classroom presentations.

**ML 333 - Independent Study in Military Leadership (1-3 cr.)**

See "Independent Study".

**ML 334 - Independent Study in Military Leadership (1-3 cr.)**

See "Independent Study".

**ML 401 - Leadership and Officership I (3 cr.)**

This course provides an introduction of Army staff organization, functions, and processes. Personnel and training management; includes counseling techniques and Army career management perspectives. Refines leadership skills to lead people and manage resources.

**ML 402 - Leadership and Officership II (3 cr.)**

This course focuses on military law and ethics, constitutional basis of powers, basic principles of criminal law and ethics, rules of evidence, military judicial structuring within the Army, and issues dealing with problems faced by the newly commissioned officer.

**MUS - MUSIC****MUS 101 - Introduction to Music (3 cr.)**

A nontechnical course guides students in approaching classical music of the 16th - 20th centuries. Topics include the diversity of musical forms, historical backgrounds, composer biographies, and selected musical examples.

Distribution: GUR/MR

Offered: every semester.

Formerly "Music Appreciation"

**MUS 102 - The Art of Singing (3 cr.)**

Intended for students with little or no singing background, this course is designed to be a "lab choir." Students will study basic techniques of good ensemble vocal production, and will learn fundamentals of music reading, musicianship, and choral singing. Lecture rehearsals may be augmented with assigned listening and video screenings.

**MUS 110 - Beginning Guitar (3 cr.)**

This course is designed as an introduction to guitar for those with little or no experience on the instrument. Skills to be developed

include reading basic notes on a staff in first position, learning basic first position chords, using standard notation, reading Tablature, playing melodies with a pick, learning basic strumming styles, and playing in a group. All techniques and music theory will be taught in the context of songs. An acoustic guitar is preferred for classroom use.

Students who have at least a year experience playing guitar should sign up for MUS 210 Intermediate Guitar.

### **MUS 120 - American Popular Music (3 cr.)**

This course is designed to be an introduction to the art of song as found in a wide range of American forms such as folk, musical theater, jazz, pop, and rock. Attention will be paid to the origins of music and the contexts in which it has been performed. The course aims to help students identify not only various genres but well-known singers and songs as well, and, for musical theater, some of the shows the songs are from. Poetic content and artistry of lyrics will be examined. Basic concepts of musicianship will also be covered (rhythm, meter, pitch, style, harmony, voice parts, instrumentation, etc.), as they pertain to the recordings.

Formerly MUS 320

### **MUS 141-148 - University Singers (1 cr.)**

Prerequisite: Permission of instructor.

Students receive credit for participating in rehearsals and performances of the jazz choir.

### **MUS 151-158 - Campus Chorus (1 cr.)**

Prerequisite: Permission of instructor.

Students participate in the performance of the campus chorus.

### **MUS 161-168 - Pep Band (1 cr.)**

Prerequisite: Permission of instructor.

Students participate in the performances of the University's pep band.

### **MUS 181-188 - Concert Band (1 cr.)**

Prerequisite: Permission of instructor required.

Students participate in the practice and performance of the University's concert band.

### **MUS 190 - Special Topics in Music (1-3 cr.)**

Topics in music that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **MUS 201 - Basic Music Theory and Composition (3 cr.)**

An introduction to the art and science of music theory covering musical notation, rhythm, and harmony. These techniques are then put to practical use through the art of composing. The students will be able to write their own music and hear them performed in class.

### **MUS 210 - Intermediate Guitar (3 cr.)**

Prerequisite: MUS 110 or permission.

This course is aimed at those who already have some experience playing guitar. It will introduce students to notes and chords beyond first position. The first unit is on power chords and barre chords. The

second unit introduces students to basic finger style guitar and finger picking, with a special focus on acoustic blues and Travis-picking. All techniques and music theory will be taught in the context of songs. Skills to be developed include reading Tablature and chord charts, learning basic chord theory, and playing in a guitar ensemble.

An acoustic guitar is preferred for classroom use.

### **MUS 230 - The Music of Social Protest (3 cr.)**

An exploration of the historical contexts, and the political, psychological, and artistic components of the music, both in the United States and around the world. Through sound recordings, film viewings, and readings, students will become familiar with some of the major genres, artists, and musical compositions that comprise the body of music of social protest. Issues of commercialization and the global market will be discussed in relationship to protest music.

### **MUS 240 - World Music (3 cr.)**

This course is an introduction to the music of the world's people, including South and Central America, Africa, and Asia. Music will be studied in the context of a people's history and cultural traditions. Includes extensive listening, film viewing, and cultural studies.

### **MUS 250 - CMSS Individualized Musical Instrument Instruction (3 cr.)**

Prerequisite: permission of the coordinator of music.

Fee: \$300. Private instruction at the Community Music School of Springfield (CMSS) in such instruments as bass (electric and string), cello, clarinet, drums, flute, guitar (acoustic and electric), piano, saxophone, trombone, trumpet, and violin. Twelve 50 minute sessions. (If a student withdraws prior to the second lesson, \$254 of the fee shall be reimbursed. If a student withdraws after the second lesson but prior to the third, the student shall be reimbursed \$200 of the fee. If a student withdraws after the third lesson, the student shall not receive a reimbursement of any of the fee.) Students solely responsible for selecting the day/time of the lesson by dealing directly with the CMSS. Students are responsible for their own transportation to and from the CMSS. MUS 250 is offered in the fall, MUS 251 in the spring term. May be taken more than once for credit. Offered: every semester.

\$300

### **MUS 251 - CMSS Individualized Musical Instrument Instruction (3 cr.)**

Prerequisite: permission of the coordinator of music.

Fee: \$300. Private instruction at the Community Music School of Springfield (CMSS) in such instruments as bass (electric and string), cello, clarinet, drums, flute, guitar (acoustic and electric), piano, saxophone, trombone, trumpet, and violin. Twelve 50 minute sessions. (If a student withdraws prior to the second lesson, \$254 of the fee shall be reimbursed. If a student withdraws after the second lesson but prior to the third, the student shall be reimbursed \$200 of the fee. If a student withdraws after the third lesson, the student shall not receive a reimbursement of any of the fee.) Students solely responsible for selecting the day/time of the lesson by dealing directly with the CMSS. Students are responsible for their own transportation to and from the CMSS. MUS 250 is offered in the fall, MUS 251 in the spring term. May be taken more than once for credit. Offered: every semester.

\$300

**MUS 290 - Special Topics in Music (1-3 cr.)**

Topics in music that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

**MUS 331 - Rock and Roll: 1950 to 1990 (3 cr.)**

An exploration of the evolution of rock and roll from the blues and folk influence to hip hop. Major artists will be studied, as well as the role of advancements in sound technology and the growth of music as an industry.

**MUS 333 - Independent Study in Music (1-3 cr.)**

See "Independent Study".

**MUS 334 - Independent Study in Music (1-3 cr.)**

See "Independent Study".

**MUS 390-393 - Special Topics in Music (1-3 cr.)**

Topics in music that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

**NSCI - NEUROSCIENCE****NSCI 212 - Introduction to Behavioral Neuroscience (3 cr.)**

Prerequisite: PSY 101.

This is a systematic study of the physiological basis of behavior with an emphasis on the role of the central nervous system. The course serves as an introduction to cellular and behavioral neuroscience for psychology and neuroscience majors. Topics include structure and function of the central nervous system (brain, neurons and synapses), sensation and perception, psychopharmacology, neuroanatomy and neurochemistry of learning and memory, emotions, and psychological disorders.

Distribution: MR

**NSCI 224 - Sensation and Perception (3 cr.)**

Prerequisite: One non-lab science and one lab science course is required prior to taking this as an NSP course (BIO 101 or BIO 107/BIO 117 or CHEM 101).

This Natural Science Perspective (NSP) course examines the physiological basis of sensation and uses a comparison of multiple approaches to measure the internalization of sensory stimuli into a private, meaningful experience (perception). All that we feel, think and do depends on sensations and perceptions. The physiological and psychological aspects underlying sensory experiences are combined in a thought-provoking manner that engages students. Students will learn how sensory systems filter information to the brain where it is further processed into a perception of the environment. The content is discussed in light of contemporary applications, human experience, and the problems that occur when sensation is diminished or lacking.

**NSCI 232 - Research Methods in Neuroscience (3 cr.)**

Prerequisite: PSY 207 or MATH 120

This course presents an overview of research methods in neuroscience. Students will learn the process of selecting a research topic, designing an experiment, analyzing the results, and presenting their findings in a research paper. Additionally students will be

introduced to basic research methods and design principles using relevant examples from neuroscience such as the principles of design of fMRI studies, the use of transgenic mice, and conditional gene knockouts. Important topics such as professional ethics, fundamental statistics and data analysis tools, the range of possible experimental designs (from simple descriptive studies to multifactorial designs), and ways to control unwanted variables and avoid common pitfalls will be discussed.

Distribution: MR

**NSCI 247 - Scientific Communication (3 cr.)**

Prerequisite: ENGL 133, NSCI 212 or permission of the chair.

This course is designed to develop communication skills in the sciences. Many forms of scientific communication will be examined including traditional manuscripts, poster presentations, digital presentations and federal grant composition. This course satisfies the writing intensive course requirement for Arts and Sciences students.

**NSCI 248 - Reproductive Endocrinology and Physiology (3 cr.)**

Prerequisite: BIO 101 or BIO 107/BIO 117

This course addresses reproductive strategies of non-humans, human reproductive anatomy and physiology, human reproductive endocrinology and human reproductive medicine. This latter topic will occupy a large portion of the term. We will broadly introduce physiological systems of hormone regulation and modulation as well as reproduction. Students will learn the science behind contemporary issues in reproductive medicine and make comparisons of infertility statistics from the World Health Organization with those from the American Society for Reproductive Medicine (via CDC).

**NSCI 250 - Neuroscience Lab Rotation I (1 cr.)**

Prerequisite: NSCI 212.

In this course the students have the opportunity to rotate into a faculty's neuroscience lab and acquire basic technological skills and knowledge of the research in progress.

Distribution: MR

**NSCI 251 - Neuroscience Lab Rotation II (2 cr.)**

Prerequisite: NSCI 250.

In this course the students have the opportunity to rotate into a faculty's neuroscience lab and acquire basic technological skills and knowledge of the research in progress. The student will begin to take the lead on some experiments and show proficiency in animal handling and care.

Distribution: MR

**NSCI 267 - Neurobiology (4 cr.)**

Prerequisite: NSCI 212 or BIO 108/BIO 118

This course is an introduction to molecular and cellular principles of neurobiology and the organization of neural networks. Topics include developmental and synaptic plasticity. The course will include laboratory experience electrically recording nerve cells, computer simulations and modeling, and examining the use of molecular techniques in neurobiology.

Distribution: MR

**NSCI 312 - Cognitive Neuroscience (3 cr.)**



Prerequisite: NSCI 212 or Permission of Chair

This course will provide a comprehensive study of the neural systems that underlie human perception, emotions, memory, and language; and of the clinical disorders that result from damage to these systems. Following a review of neural cell physiology and neuroanatomy, the course will focus on the manner in which basic cognitive functions are disrupted subsequent to brain injury. Current diagnostic methods will be studied, including an examination of how to interpret research/clinical findings and detect inherent limitations.

### **NSCI 324 - Animal Learning Lab (4 cr.)**

Prerequisite: NSCI 212 or PSY 313, or Permission of Chair

The basic principles of operant conditioning are demonstrated in two non-invasive behavioral experiments using standard operant conditioning equipment for rodents. Course content will cover operant and respondent conditioning, extinction, shaping, schedules of reinforcement, discrimination training, and inhibitory learning. Students will be required to prepare IMRAD formatted papers (Introduction, Methods, Results, And Discussion) based on their experimental results. Students will be responsible for conducting their own experiments (recording and analyzing data) and presenting relevant research articles in the student journal club.

### **NSCI 333-334 - Independent Study in Neuroscience (3 cr.)**

See "Independent Study".

### **NSCI 348 - Sport-Induced Concussions (3 cr.)**

Prerequisite: Sophomore standing

This course is designed to provide a comprehensive examination of sport-induced concussions, combining the basic medical science of closed head injury with the policy and practice of assessing and managing concussions on and off the playing field. The course content includes an introduction to brain anatomy and the neurological effects that occur in response to physical trauma to the brain; a description of the immediate and long term symptoms associated with concussions and a review of the cognitive and neurological diagnostic tools used for evaluation; an examination of the effects of repeated concussions, Post-concussion Syndrome, and rehabilitation options for concussed patients; an investigation of the management of concussions and return-to-play protocols.

### **NSCI 350 - Neuroscience Lab Placement I (3 cr.)**

Prerequisite: NSCI 250/NSCI 251.

In this course the students will further increase their knowledge and skill level in a faculty's neuroscience lab. The student will conduct research more independently; assist in the training and supervision of other students; and read, comprehend, and lead journal club discussions of relevant research articles.

### **NSCI 351 - Neuroscience Lab Placement II (3 cr.)**

Prerequisite: NSCI 250/NSCI 251.

In this course the students will further increase their knowledge and skill level in a faculty's neuroscience lab. The student will conduct research more independently; assist in the training and supervision of other students; and read, comprehend, and lead journal club discussions of relevant research articles.

### **NSCI 380 - Neural Systems and Behavior (3 cr.)**

Prerequisite: NSCI 212, BIO 108 or permission of the chair.

In this course students will examine the link between systems level neuroscience and behavior. The course will focus on models used in research, and especially non-human models (e.g. dolphins, lobsters, etc). The course will address the basic circuits, electrophysiological phenomena, and modulators of neural systems as they pertain to animal behavior. Students will consider matters of neuroethology through discussion of recent advances in the literature/scientific publications.

### **NSCI 381 - Evolution of Nervous Systems (3 cr.)**

Prerequisite: NSCI 212 and NSCI 267 (concurrent enrollment)

As one of just four categories of tissue persistent across the great phylogeny of animals, nervous tissue likely offered our kingdom notable fitness to adapt to ecological changes throughout the nearly billion years of animal evolution. This course will survey theories on the origins of electrical tissue and follow tissue specialization from its departure from a putative ancestral and contractile tissue through the arrangement of electrical cells into progressively more complex systems. We will examine the efficacy of several of these nervous system designs (e.g. distributed networks, flanking longitudinal connectives, and centralized nervous systems). We will engage the challenging problem of appreciating elegance in solving ecological problems ('selective pressures') with simple neural systems, and why more complex systems may have provided some benefit ('fitness'). Lastly, the contributions of several investigators of neural evolution including DuJardin, Cajal, and Gould will be considered.

### **NSCI 385 - Neurodevelopment (3 cr.)**

Prerequisite: NSCI 212; BIO 306 recommended, or permission of the chair.

Across species, formation of the nervous system shares some common mechanisms. This conservation enables the study of a variety of species. This course will describe the key concepts that contribute to nervous system development in several model organisms, covering concepts such as neurogenesis, neural migration and axon growth/guidance, synaptic activity and apoptosis. Research techniques as they apply to development in genetics and molecular biology are briefly explained.

### **NSCI 387 - Stem Cells and Adult Neurogenesis (3 cr.)**

Prerequisite: NSCI 212; NSCI 385 is recommended, or instructor's permission

Stem cells are in the media all the time, but students are learning very little about them. In this course, embryonic and adult stem cells will be examined in terms of their molecular, cellular and potential therapeutic properties. Students will learn about the different types of stem cells (embryonic, adult-generated and induced pluripotent cells) and the clinical applications.

Adult neurogenesis refers to the areas of the mature brain that continue to produce neurons throughout life. Students will learn about adult neurogenesis in the context of behavior and disease such as depression and degeneration.

### **NSCI 401 - Genetic & Molecular Tech in Neurosci (4 cr.)**

Prerequisite: NSCI 212 and NSCI 267 or Instructor's Approval

This practice-based, laboratory course introduces students to a selection of advanced techniques and methods used in contemporary

genetic and molecular neuroscience. The common fruit fly, *Drosophila melanogaster*, will be examined and utilized as our model organism because it offers unparalleled genetic tools, rapid lifespan turn-over, and relatively simple anatomy and physiology. Some of the techniques that students will practice include:

immunohistochemistry and immuno-fluorescence (fixation, primary and second antibody conjugation), fluorescence microscopy (excitation, emission, and filter cube physics), inverted microscopy (physiologic microscopy, activation of synapses and calcium indicator dyes), both end-point and quantitative Polymerase Chain Reaction (PCR), "fly pushing" (produce mutant strains), and evaluation of custom cassette inserts to the fruit fly genome (e.g. GAL4/UAS, GAL80 / temperature sensitive control, and geneswitch lines).

#### **NSCI 405 - Seminar in Neuroscience (3 cr.)**

Prerequisite: NSCI 267 and NSCI 232; or PSY 309 or permission of chair.

This capstone seminar will cover current approaches and techniques in the field of neuroscience. Guest speakers and Western New England faculty in neuroscience and related areas will present their research. In this course, students critically review the relevant literature, develop skills in oral presentation of scientific data and analysis of experimental results, and interact with faculty members working in fields associated with the topics discussed. The role of the instructor is to provide perspectives or guide the discussions, but the emphasis is on efforts by the students. The students are expected to critically read the designated papers and sufficient other references to place the paper in context, then clearly and critically present its results and conclusions and lead a round-table discussion with the other students.

Distribution: MR

Changed from 4 crs to 3 crs Fall'20

#### **NSCI 424 - Neurobiology of Addiction (3 cr.)**

Prerequisite: NSCI 212; or permission of Chair

This course will engage in the latest discussion on the neural theory of addiction. Most of the course will examine current theories and research in drug addiction, emphasizing our current understanding of the neurobiological mechanisms of addiction for psychostimulants, opioids, alcohol, nicotine, and cannabinoids. In addition to lecture, students will have the opportunity to conduct behavioral pharmacology experiments and learn to report their findings in an IMRAD-formatted research paper.

#### **NSCI 450 - Senior Neuroscience Thesis I (4 cr.)**

Prerequisite: NSCI 350/NSCI 351.

In the first semester of this course the student will prepare and present a research proposal, and begin data collection for their senior research project. In the second semester the student will complete the data collection, analyze their results, and write a complete APA thesis of their senior research project. The student will assist the sponsoring faculty in preparing the paper for a conference presentation and for publication, if required.

#### **NSCI 451 - Senior Neuroscience Thesis II (4 cr.)**

Prerequisite: NSCI 350/NSCI 351.

In the first semester of this course the student will prepare and present a research proposal, and begin data collection for their senior research project. In the second semester the student will complete the

data collection, analyze their results, and write a complete APA thesis of their senior research project. The student will assist the sponsoring faculty in preparing the paper for a conference presentation and for publication, if required.

### **PH - PHILOSOPHY**

#### **PH 103 - Introduction to Philosophy (3 cr.)**

This course examines basic assumptions about reality, knowledge, and values. Students learn how to explain, analyze and evaluate arguments. Topics discussed and analyzed may include long-standing questions in philosophy and modern applications such as: Does God exist? Are we a combination of body and soul? Do we have free will? What do we know and how do we know it? Can moral beliefs be objectively true or false? What is the best form of government? Are non-human animals moral subjects?

Distribution: MR

Offered: every semester.

#### **PH 110 - Critical Thinking (3 cr.)**

This is a study of informal reasoning techniques. Topics include methods of understanding and evaluating deductive and inductive arguments, ways of detecting fallacious reasoning, and skills helpful in making practical judgments. Emphasis is on enabling students to think more clearly and reason more precisely. Does not satisfy the ethical perspectives requirement of the GUR or the Humanities requirement for A & S.

Distribution: MR

Offered: every semester.

Not open to students who completed PH 204.

#### **PH 190 - Special Topics in Philosophy (1-3 cr.)**

Topics in philosophy that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

#### **PH 204 - Symbolic Logic (3 cr.)**

This is an examination of formal methods for determining the validity of arguments and inferences. Topics include truth tables, truth trees, and natural deduction in both sentence logic and predicate logic.

Distribution: A&SR

Offered: every spring.

Does not satisfy the ethical perspectives requirement of the GUR or the Humanities requirement for A & S.

Formerly PH 104.

#### **PH 207 - Introduction to Political Theory (3 cr.)**

Prerequisite: POSC 101, or INST 101, POSC 102, three credit hours of European history or Sophomore standing.

Cross-Listed as: LSOC 207 and POSC 207

Survey course designed to introduce students to major political thinkers and schools of thought with an emphasis on classical liberalism and the social contract tradition

Distribution: GUR/MR

Offered: every semester.

Does not satisfy the ethical perspectives requirement of the GUR.

formerly Contemporary Moral Problems

### **PH 208 - Ethics (3 cr.)**

Prerequisite: Sophomore standing.

This is an introduction to the basic concepts and principles of ethics as developed from ancient to modern times. The course covers theories of the good life such as hedonism, stoicism, and self-realization; the challenge of relativism; and theories of right and wrong, such as utilitarianism. Concepts to be discussed may include virtue and vice, moral duty, moral rights, and moral responsibility.

Distribution: GUR/MR

Offered: every semester.

### **PH 210 - Ethics for Social Workers (3 cr.)**

Prerequisite: SW 100

This course presents students with principles drawn from moral philosophy and social work to be used in identifying, assessing, and resolving ethical dilemmas in social work practice. The course covers basic theories of ethics including utilitarianism and Kantian ethics as well as conceptions of virtue and vice. Case studies in social work are used throughout, applying theory to practice.

Offered: every spring semester.

### **PH 211 - Business Ethics (3 cr.)**

Prerequisite: Sophomore standing.

This is an examination of ethical problems confronting people in business and the professions. Issues include employee rights and duties, professional and corporate responsibility, affirmative action, environmental pollution, worker health and safety, advertising, government regulation, competing conceptions of justice, and alternative economic systems.

Distribution: BUSR/GUR/MR

Offered: every semester.

Formerly PH 310.

This course can be taken to fulfill the PH 211 requirement.

Cannot take both PH 211 and MAN 240 for credit.

### **PH 214 - World Ethics (3 cr.)**

Prerequisite: Sophomore standing.

This course explores the ethical traditions not only of the United States and Europe, but also of Asia, Africa, and South and Central America, both secular and religious. The course will compare the main U.S. & Western European ethical perspectives of ethical naturalism, utilitarianism, and Kantian ethics with the main Asian traditions of Buddhism, Hinduism, and Confucianism, as well as those of indigenous African cultures.

Distribution: BUSR/GUR/MR

Offered: every semester.

Formerly "Ethics Across the Continents"

### **PH 225 - Ethics of Digital Technologies (3 cr.)**

Prerequisite: Sophomore standing.

This course will address social and ethical issues that arise in the computing and information technologies. We will begin with an

introduction to moral reasoning and an overview of the main ethical theories and their normative frameworks. We will then address some of the standard topics in computer ethics, including concerns about the internet and its regulation, the ethics of search engines, privacy and surveillance, intellectual digital property, cybersecurity, and professional codes of ethics. Finally, we will explore the broader topics in the ethics of information technologies, including the ethics of big data science's methods, assumptions, and applications, the ethics of algorithms and artificial intelligence, and robot ethics.

Distribution: A&SR

Offered: every semester.

### **PH 231 - Biomedical Ethics (3 cr.)**

Prerequisite: Sophomore standing.

A critical examination of basic concepts, such as autonomy and privacy, and ethical issues in biomedical ethics, such as informed consent, euthanasia, assisted suicide, cloning, stem cell research, research and experimentation on animals, rights to healthcare, and the just allocation of medical care. Attention will also be paid to the application of major moral theories.

Offered: in alternate years.

Formerly PH 309.

### **PH 240 - Gandhi and King (3 cr.)**

Prerequisite: Sophomore standing.

Cross-Listed as: REL 240

A critical examination of the life, times, and thought of Gandhi and King. Special attention will be paid to Gandhi's campaigns to end apartheid in South Africa and the British occupation of India, as well as King's part in the U. S. civil rights movement. The course will focus on their ethical, political, and religious thought, and their commitment to nonviolence.

Offered: every other year.

This course will satisfy the ethical perspectives requirement of the GUR.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **PH 241 - Environmental Ethics (3 cr.)**

Prerequisite: Sophomore standing.

This course introduces students to the philosophical and ethical analysis of environmental issues, such as pollution, use of scarce natural resources, environmental justice, and climate change. In addition to focusing on environmental threats to human well-being, it explores the issue of humanity's duties to future generations, as well as to other species and their ecosystems. Other issues include corporate responsibility for the environment and appropriate forms of activism in defense of the environment.

Distribution: GUR/MR

Formerly Philosophy and the Environment

### **PH 245 - War, Terrorism and Torture (3 cr.)**

Prerequisite: Sophomore standing.

According to the just war tradition, some wars may be just and others unjust. If that's correct, what makes a war just or unjust? Are there moral limits to what one may do in war? For example, is terrorism always morally wrong? In fighting terrorism, can it be morally right to use torture in interrogation? Should combatants ensure that wars end in a just peace? What is a "just" peace? We will debate these questions in the context of a study of such wars as the Roman civil wars, the Crusades, the American Revolution, the American Civil War, World War I, World War II, and such terrorist campaigns or organizations as the IRA/Ireland/England conflict, al-Qaeda and ISIS/ISIL, and the Arab/Zionist conflict in Palestine.

Distribution: GUR/MR

This course satisfies the ethical perspective requirement of the General University Requirements.

Formerly "War, Torture and Terrorism"

### **PH 290 - Special Topics in Philosophy (1-3 cr.)**

Topics in philosophy that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **PH 304 - Philosophy of Religion and Spirituality (3 cr.)**

Prerequisite: Sophomore standing.

Cross-Listed as: REL 304

This course consists of analysis, interpretation, and evaluation of religious responses to the world of human experience. Topics include the concern of religion with reason, order and pattern, moral insight, and art, and the context of the problems for which religion proposes solutions. Some attention is given to the history of the subject.

Offered: every year.

Formerly Philosophy of Religion

### **PH 316 - Philosophy and Climate Change (3 cr.)**

Prerequisite: Junior standing.

In this course we will evaluate the scientific evidence for the claim that greenhouse gases are increasing global temperatures, and critically analyze some of the philosophical, economic, and political issues that arise given the possibility of anthropogenic global warming (AGW). Topics include probable consequences and effects of global warming, legitimating appeals to expertise and authority, the concepts of risk, uncertainty, and probability, rational decision-making under conditions of uncertainty, the precautionary principle, cost/benefit analyses of inaction, mitigation (prevention), and adaptation, atmospheric justice, causal and moral responsibility, ethical obligations and duties, and rights.

Satisfies A & S Writing Intensive requirement.

### **PH 330 - Contemporary Political Theory (3 cr.)**

Prerequisite: Junior Standing

Cross-Listed as: POSC 330

Distribution: MR

Cross-listed as LSOC 330 and PH 330

### **PH 333 - Independent Study in Philosophy (1-3 cr.)**

See "Independent Study".

### **PH 334 - Independent Study in Philosophy (1-3 cr.)**

See "Independent Study".

### **PH 341 - Modern and Contemporary Philosophy (3 cr.)**

Prerequisite: Junior standing.

This course introduces students to some of the major figures and schools in modern and contemporary philosophy, and may include such giants as Descartes, Locke, Hume, Kant, Mill, Hegel, Nietzsche, and Russell. Topics include metaphysics, epistemology, and ethics.

Distribution: MR

Offered: every other year.

### **PH 390 - Special Topics in Philosophy (1-3 cr.)**

Prerequisite: Junior standing or permission of the instructor.

Topics offered depend upon student interests as well as particular interests of instructors. The course is offered as often as faculty time and student interest permit. Recent topics have included "Philosophy of Mind," "Philosophy of Love," and "Aesthetics." The course may be repeated for credit if topic differs.

### **PH 480 - Internship in Philosophy (3 cr.)**

See "Internships".

Distribution: MR

### **PH 481 - Internship in Philosophy (3 cr.)**

See "Internships".

Distribution: MR

## **PHAR - PHARMACY - 1st & 2nd Professional Years**

### **PHAR 510 - Introduction To Pharmacy & Health Prof I (1 cr.)**

Prerequisite: Acceptance into 1st Year Pharmacy (Recommended, Previous).

The entering pharmacy learner explore the profession of pharmacy and other related healthcare professions in the first semester of this two course series. Learners will become acquainted with pharmacy career opportunities and pathways, and learn the importance of leadership, professionalism, and involvement in pharmacy organizations. Learners will examine the historical evolution of the pharmacist's role from one focused on drug compounding and distribution to a patient-centered practice model and interprofessional collaboration. Learners will begin the process of becoming a healthcare team member by preparing self and thinking as a team member, and will explore the roles, responsibilities, and values of other health care providers to prepare for team-based provision of care. Finally, learners will familiarize themselves with the basics (names, classes, formulations) of the most commonly prescribed medications.

Offered: Fall Only

Formerly "Introduction to Pharmacy"

### **PHAR 511 - Drug Information & Informatics (2 cr.)**

Prerequisite: Acceptance into 1st Year Pharmacy (Recommended, Previous).

Students will develop skills in providing evidence-based recommendations to both patients and other health care professionals. Learners will build upon basic drug knowledge to understand medication safety as it relates to both clinical and distributive services, as well as the implementation of quality control and assurance programs in a practice based environment. Core skills in assessing clinical questions; searching primary, secondary, and tertiary literature; and synthesizing multiple sources of information will be emphasized. Pharmacy informatics principles will be reviewed in terms of safety and efficiency improvement of the medication use process. This overall skill set will provide the foundation of drug information, medication safety, and pharmacy informatics, preparing the learner to practice evidence-based pharmacy. Poison information will also be provided periodically throughout the course.

Offered: Fall Only

### **PHAR 512 - Immunology (3 cr.)**

Prerequisite: Acceptance into 1st Year Pharmacy (Recommended, Previous).

Learners will be introduced to the basic elements of the immune system. They will gain knowledge of the mechanisms of immunity which act in a wide range of clinical conditions, including: protection against infectious agents; rejection of tumors; transplantation of tissues and organs; autoimmune and other immunopathologic conditions; and allergy.

Offered: Fall Only

### **PHAR 513 - Biochemistry (3 cr.)**

Prerequisite: Acceptance into 1st Year Pharmacy (Recommended, Previous).

Learners will explore the fundamental biochemical principles underlying cellular physiology and biological processes. They will gain knowledge of biomacromolecules mainly from a structural point of view. Learners will gain insight into molecular metabolic and synthetic pathways in order to provide a foundation for understanding disease states, mechanisms of drug action and drug metabolism.

Offered: Fall Only

### **PHAR 514 - Pharmaceutics I (2 cr.)**

Prerequisite: Acceptance into 1st Year Pharmacy (Recommended, Previous).

Learners will study the measurement units, and mathematical functions and applications that are essential to the safe, accurate practice of pharmacy in this course. They will gain familiarity and be able to relate pharmaceutical nomenclature, numerical expressions, measurement equivalents, calculation formulas, problem analysis, and reasoning.

Offered: Fall Only

### **PHAR 516 - Pharmacy Ethics (3 cr.)**

Prerequisite: Acceptance into 1st Year Pharmacy (Recommended, Previous).

Learners will be introduced to the major ethical theories and principles of bioethics. They will also be introduced to the legal concepts that encompass the rights and responsibilities of the pharmacist and their practical application. Learners will begin to

appreciate the relationship of ethics and ethical decision making, within legal constructs, of a health care provider in a culturally diverse population.

Offered: Fall Only

### **PHAR 517 - Healthcare Policy & Delivery (2 cr.)**

Prerequisite: Acceptance into 1st Year Pharmacy (Recommended, Previous).

Students will be introduced to the U.S. health care system and managed health care. The students will learn about the structure, organization, financing and delivery of health care in the United States with emphasis placed on pharmacy.

Offered: Fall Only

### **PHAR 518 - Pharmaceutical Calculations (2 cr.)**

Prerequisite: Acceptance into 1st Year Pharmacy (Recommended, Previous).

Learners will explore the study of measurement units, numerical conversion or equivalency factors, and mathematical solving methods that are common and vital to the safe and accurate practice of pharmacy. Learners will focus on pharmaceutical nomenclature, measurement constants or equivalents, calculation formulas and methods, and problem analysis and solving. They will be introduced to prescription interpretation, prescription notation and abbreviations, basic pharmaceutical calculations, statistics, and the mathematics of chemical kinetics, pharmaceuticals, and pharmacokinetics.

Offered: Fall Only

### **PHAR 520 - Healthcare Communications (3 cr.)**

Learners will explore effective communication methods for creating positive, therapeutic relationships. They will learn to apply written and verbal communication skills and behavioral interventions with diverse populations, including patients, families, and other healthcare providers. Learners will develop the ability to effectively interact with low literacy and non-English speaking patients. Cultural competence will be introduced to aid interactions and communications with patients possessing diverse values, beliefs, and behaviors. Skills in interviewing, active listening and empathy, assertiveness, and problem-solving will be emphasized.

Offered: Spring Only

### **PHAR 522 - Pathophysiology (3 cr.)**

Learners will gain understanding of the basic principles and mechanisms of disease, including inflammation and repair, degeneration, disturbances on hemodynamics, developmental defects, and neoplasia. They will focus on select disease states of organ systems with the goal of providing a rationale for drug therapy.

Offered: Spring Only

### **PHAR 523 - Genetics & Genomics (2 cr.)**

Students will learn the basic principles and processes involved in genetic inheritance and gene expression. In addition, students will explore how genetic variation arises and is the basis for a number of diseases and individual responses to environmental factors, including medication therapy. Students will be introduced to basic pharmacological concepts, such as pharmacokinetic and pharmacodynamic processes. Variation in therapeutic response in patients will be linked to genetic variation of the proteins involved in these pharmacological processes. Students will explore various

resources that can be used to guide the use genetic patient information for developing therapeutic recommendations. The ethical, legal, and social implications of utilizing genetic information clinically, will also be discussed.

Offered: Spring Only

### **PHAR 524 - Pharmaceutics II (2 cr)**

Learners will gain knowledge of medicinal formulations and physical/chemical properties of drugs. They will investigate the stability of compounded products, quality control, sterilization, biotechnology preparations, and pharmaceutical compounding using the foundational principles of pharmaceutical calculations. Learners will explore the process by which dosage form affects drug absorption, distribution, metabolism and elimination.

Offered: Spring Only

### **PHAR 525 - Pharmaceutics II Lab (1 cr.)**

Learners will examine the legal, practical and scientific bases of drug products and pharmaceutical delivery systems. They will apply their knowledge of physicochemical theories, terminology, and pharmaceutical skills in the preparation of oral and topical formulations.

Offered: Spring Only

### **PHAR 526 - Pharmacy Outcomes (2 cr.)**

Learners will gain an understanding of how pharmacoeconomic, clinical, and humanistic outcomes relate to the provision of pharmacy care in various health care areas. They will review trends in innovative service provision, examine systems for patient care improvement, describe key concepts in outcomes management, and discuss successful cases from the professional literature.

Offered: Spring Only

### **PHAR 527 - Self Care Therapeutics (3 cr)**

In this early exposure, learners will acquire a knowledge base of community pharmacy practice. Learners will begin to gain insight and develop a sense of community involvement in pharmacy practice by shadowing and applying basic pharmacy care. Through observation and participation, learners will explore the various facets of community pharmacy practice by integrating communication skills and relating didactic instruction to civic involvement, humanistic care of patients, and social awareness of unmet medical needs. This may include, but is not limited to: companionship; patient care; medication-related services; screening for medical problems; dispensing pharmaceuticals; medication counseling; purchasing; inventory control; and varying management styles. Learners will gain insight into self and professional goals through reflection and continued development of professional portfolios. An on-campus orientation will be required for all learners prior to starting their IPPEs. Learners will give presentations at the end of the semester.

Offered: Spring Only

### **PHAR 528 - Intro to Pharmacy & Health Prof II (1 cr)**

The pharmacy learner will continue to be introduced to various pharmacy career paths and opportunities, examine the history of pharmacy and explore more healthcare professions in this second course of the two course series. Learners will become acquainted with pharmacy career opportunities and pathways, and learn the importance of leadership, professionalism, and involvement in pharmacy organizations. They will examine the historical evolution

of the pharmacist's role from one focused on drug compounding and distribution to a patient-centered practice model and interprofessional collaboration. Learners will continue the process of thinking as a team member by reviewing similarities and differences in communication techniques among various healthcare professionals. Learners will gain insight into self and professional goals through reflection.

Offered: Spring Only

### **PHAR 533 - Indep Study in Phar (1 cr)**

Offered: Fall Only

### **PHAR 534 - Indep Study in Phar (1 cr)**

Offered: Spring Only

### **PHAR 540 - IPPE Health Services (2 cr)**

This course is based on the College of Pharmacy's outcome statements and accreditation standards for introductory pharmacy practice experience. In this rotation, learners will build a knowledge base of institutional pharmacy practice. Learners will gain insight and develop a sense of involvement in institutional pharmacy practice by applying basic pharmacy care within various aspects of the health system. Through observation and participation, learners will explore the various facets of health system pharmacy practice by integrating communication skills and relating didactic instruction to clinical involvement, humanistic care of patients, and social awareness of unmet medical needs. This may include, but is not limited to: patient care; medication-related services; screening for medical problems using a collaborative approach; and working within organizational structures with varying management styles. Learners will also develop an appreciation of various practice modalities, inclusive of, but not limited to: prescriber order entry systems, electronic medical records, prescription automation and informatics, purchasing, formulary control, medical teams, research, and committees. Learners will continue to gain insight into self and professional goals through reflection and on-going development of professional portfolios.

Offered: Spring Only

### **PHAR 541 - IPPE Community (2 cr)**

In this early exposure, learners will acquire a knowledge base of community pharmacy practice. Learners will begin to gain insight and develop a sense of community involvement in pharmacy practice by applying basic pharmacy care. Through observation and participation, learners will explore the various facets of community pharmacy practice by integrating communication skills and relating didactic instruction to civic involvement, humanistic care of patients, and social awareness of unmet medical needs. This may include, but is not limited to: patient care; medication-related services; screening; for medical problems; dispensing pharmaceuticals; medication counseling; purchasing; inventory control; and varying management styles. Learners will gain insight into self and professional goals through reflection and continued development of professional portfolios. Learners will give presentations at the end of the semester.

Offered: Spring Only

### **PHAR 580 - Professional Development I (0 cr)**

In addition to curricular requirements, learners are required to satisfy professional development requirements. These program requirements have been selected by the College of Pharmacy to foster personal and professional growth and development. Learners will be required to develop and utilize electronic portfolios to document professional

experiences (e.g., meetings, activities, assignments), track community service, and reflect upon and assess learning activities and experiences. The learners' academic advisors will review and assess the portfolios and provide the learner feedback. The portfolio requirements for each academic year must be satisfied in order for learners to progress into the next academic year. As directed by the Associate/Assistant Dean for Academic Affairs, learners will meet on campus for portfolio development, assessment activities, and Dean's Seminar. Dean's Seminar provides learners with insight into current pharmacy and health care-related issues through guest presentations.

#### **PHAR 590 - Special Topics in Pharmacy (1 cr)**

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

Offered: Fall Only

#### **PHAR 591 - Special Topics in Pharmacy (1 cr)**

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

Offered: Spring Only

#### **PHAR 610 - Principles of Pharmacokinetics (4 crs.)**

Prerequisite: Acceptance into 2nd Year Pharmacy (Recommended, Previous).

Learners will study the theoretical, mathematical, and functionally dependent physiologic relationships that comprise the quantitative basis for determining population and patient-specific drug dosage regimens. Learners will focus on the rate, time course, and extent of drug absorption, distribution, and elimination. They will utilize data of drug plasma concentrations in order to calculate and monitor safe and effective drug dosing regimens. Learners will practice fundamental pharmacokinetics concepts by calculating population and patient-specific dosage regimen of selected drugs used in various disease states.

Offered: Fall Only

#### **PHAR 611 - Principles of Pharmacology (3 cr.)**

Prerequisite: Acceptance into 2nd Year Pharmacy (Recommended, Previous).

Learners will explore the basic physiological, pathophysiological and biochemical foundations for the interaction of drugs with biological systems. Topics will include pharmacological principles such as mechanism of action, pharmacodynamics, drug-drug interactions, adverse reactions, and factors that can alter expected pharmacologic results. Autonomic drugs are used to illustrate pharmacological principles associated with pharmacotherapy that will be required for learners to build upon in future courses.

Offered: Fall Only

#### **PHAR 612 - Principles of Medicinal Chemistry (3 cr.)**

Prerequisite: Acceptance into 2nd Year Pharmacy (Recommended, Previous).

Learners will be introduced to the general principles of drug action at the molecular-level. They will focus on the physical, chemical, and biochemical properties of drug substances; the relationships between chemical structure and pharmacological activity; the molecular basis for drug-receptor interactions; and drug metabolism.

Offered: Fall Only

#### **PHAR 614 - Patient Assessment Skills Lab (1 cr)**

Prerequisite: Acceptance into 2nd Year Pharmacy (Recommended, Previous).

Learners will be introduced to basic patient assessment skills, including patient interview, physical assessment, and laboratory parameter evaluation. Learners will receive hands-on training with health assessment devices, and explanation of the practical operation and function of self-care diagnostic products. They will refine and apply verbal and written communication skills in a standardized patient care encounter setting and its associated documentation in the SOAP format.

Offered: Fall Only

#### **PHAR 615 - Professional Pharmacy Practice Lab (1 cr)**

Prerequisite: Acceptance into 2nd Year Pharmacy (Recommended, Previous).

Learners will acquire the necessary skills for dispensing drugs, in this competency-based course, as they relate to community, hospital, home healthcare, and long-term care settings. Learners will gain knowledge of the technical aspects of dispensing drug products, medication errors and safety controls, controlled substances, third party reimbursement, pharmacy ethics, and supervisory skills. They will become familiar with informatics and automation commonly found in practice settings.

Offered: Fall Only

#### **PHAR 616 - Practice Management I (2 crs.)**

Prerequisite: Acceptance into 2nd Year Pharmacy (Recommended, Previous).

The Pharmacy Practice Management course series cover primary management functions performed by pharmacists in diverse practice settings. The overarching goals for the course are to prepare students to manage challenges in their practice settings and expand their roles to provide innovative patient care services. Students will explore content on leadership, human resources management, pharmacy operations, entrepreneurship and financial analysis among others. Furthermore, the Innovative Advanced Pharmacy Services Project provides the opportunity for students to develop a business proposal, which culminates in a poster session at the end of the Spring semester. Effective health care delivery requires an understanding of the complex clinical and business systems in which pharmacy exists. Student pharmacists need to possess the business acumen to develop, manage, and evaluate their future practice profitably.

Offered: Fall Only

#### **PHAR 620 - Self Care Therapeutics (3 crs.)**

Learners will review the selection of nonprescription products for the self-treatment of common disorders. Learners will become prepared to evaluate patients who can safely and effectively be treated with nonprescription treatments. Learners will familiarize themselves with nonprescription medications, herbals, vitamins, homeopathic products, and medical devices used by patients for self-treatment of common disorders.

Offered: Spring Only

#### **PHAR 621 - Integrated Pharmacy Care- Renal (2 crs.)**

Learners will review the physiologic/pathophysiological alterations in the aged and pediatric populations. They will examine the medicinal chemistry; pharmacology; kinetics; social and administrative issues; and the specific therapeutic management in these populations.

Common issues in special populations and special environments will also be explored.

Offered: Spring Only

### **PHAR 622 - Integrated Pharmacy Care- Respiratory (2 crs.)**

Learners will gain knowledge of pathophysiology and clinical presentation of common diseases of the renal system. They will integrate medicinal chemistry; pharmacology; kinetics; and social and administrative sciences of common therapeutic agents used to treat renal diseases in order to provide and recommend optimal pharmacotherapeutic management.

Offered: Spring Only

### **PHAR 623 - Integrated Pharmacy Care - CVS I (2 crs.)**

Learners will gain knowledge of pathophysiology and clinical presentation of common diseases of the cardiovascular system and associated risk factors. They will integrate medicinal chemistry; pharmacology; kinetics; and social and administrative sciences of common therapeutic agents used to treat cardiovascular disease and risk factors in order to provide and recommend optimal pharmacotherapeutic management.

Offered: Spring Only

### **PHAR 624 - Integrated Pharmacy Care - CVS II (2 crs.)**

Learners will gain knowledge of pathophysiology and clinical presentation of common diseases of the cardiovascular system. They will integrate medicinal chemistry; pharmacology; kinetics; and social and administrative sciences of common therapeutic agents used to treat complicated cardiovascular disease states in order to provide and recommend optimal pharmacotherapeutic management.

Offered: Spring Only

### **PHAR 625 - Applied Pharmacy Care I (1 crs.)**

Learners will apply the processes of problem solving, critical thinking, abstract thinking, and differential diagnosis to optimize and manage pharmacy care with common disease states. They will apply information learned in the didactic integrated course sequences to patient care scenarios using problem-based learning methods. Learners will transition from dependence to independence in the learning process through this three course sequence which is built on the premise of "see one, do one, teach one." Faculty will present and discuss health care problems (cases) and facilitate group activities in the process of problem resolution.

Offered: Spring Only

### **PHAR 626 - Practice Management II (2 crs.)**

The Pharmacy Practice Management course series cover primary management functions performed by pharmacists in diverse practice settings. The overarching goals for the course are to prepare students to manage challenges in their practice settings and expand their roles to provide innovative patient care services. Students will explore content on leadership, human resources management, pharmacy operations, entrepreneurship and financial analysis among others. Furthermore, the Innovative Advanced Pharmacy Services Project provides the opportunity for students to develop a business proposal, which culminates in a poster session at the end of the Spring semester. Effective health care delivery requires an understanding of the complex clinical and business systems in which pharmacy exists.

Student pharmacists need to possess the business acumen to develop, manage, and evaluate their future practice profitably.

Offered: Spring Only

### **PHAR 627 - Sterile Products Lab (1 cr)**

Learners will gain skills in aseptic technique, administration, and quality assurance procedures for sterile drug products. They will gain knowledge and experience compounding sterile preparations, utilizing infusion devices and catheters, and applying clean room and USP 797 requirements.

Offered: Spring Only

### **PHAR 628 - Lit Eval & Evidence-Based Practice (3 crs.)**

Learners will gain familiarity with research methodology and applied statistical analysis so they may critically evaluate and assess the validity and limitations of medical literature. The learner will build upon Spring PY1's pharmacy outcomes course, as well as Fall PY1's drug information, medication safety, and pharmacy informatics course. Goals include improving clinical practice abilities within the application of evidence-based practice. Emphasis will be placed upon evaluation of primary literature, and learners will practice evaluating literature to determine its application to practice.

Offered: Spring Only

Formerly PHAR 521 "Informatics & Evidence-Base Prac II"

### **PHAR 631 - Indep Study in Phar (1 cr)**

### **PHAR 632 - Indep Study in Phar (1 cr)**

### **PHAR 633 - Indep Study in Phar (1 cr)**

Offered: Fall Only

### **PHAR 634 - Indep Study in Phar (1 cr)**

Offered: Spring Only

### **PHAR 635 - Indep Study in Phar (3 crs.)**

### **PHAR 642 - IPPE Community (2 crs.)**

Prerequisite: Acceptance into 1st Year Pharmacy (Recommended, Previous).

Learners will develop a deeper sense of community involvement in pharmacy practice through extended exposure to and application of community pharmacy practice. Learners will continue to expand their understanding of various practice modalities covered in PHAR 541. Learners will continue their exploration of the various facets of community pharmacy practice by integrating communication skills and relating didactic instruction to civic involvement, humanistic care of patients, and social awareness of unmet medical needs. This may include, but is not limited to: patient care; medication-related services; screening for medical problems; dispensing pharmaceuticals; medication counseling; purchasing; inventory control; and varying management styles. Learners will continue to gain insight into self and professional goals through reflection and continued development of professional portfolios. Learners will give presentations at the end of the semester.

Offered: Fall Only



**PHAR 643 - IPPE Health System (2 crs.)**

Prerequisite: Acceptance into 1st Year Pharmacy (Recommended, Previous).

In this early exposure, learners will begin to build a knowledge base of institutional pharmacy practice. Learners will gain insight and develop a sense of involvement in institutional pharmacy practice by applying basic pharmacy care within various aspects of the health system. Through observation and participation, learners will explore the various facets of health system pharmacy practice grating communication skills and relating didactic instruction to clinical involvement, humanistic patients, and social awareness of unmet medical needs. This may include, but is not limited to: care; medication-related services; screening for medical problems using a collaborative approach; and working within organizational structures with varying management styles. Learners will also develop an appreciation of various practice modalities, inclusive of, but not limited to: prescriber order entry systems, electronic medical records, prescription automation and informatics, purchasing, formulary control, medical teams, research, and committees. Learners will continue to gain insight into self and professional goals through reflection and on-going development of professional portfolios: Learners will give presentations at the end of the semester.

Offered: Fall Only

**PHAR 650 - The Evolution of Pharmacy (3 crs.)**

Prerequisite: 2nd/3rd Year Pharmacy (Recommended, Previous).

Learners will study the history and culture of the pharmacy profession from pre-historic times to the present day, starting with the ancient civilizations and progressing to modern U.S. practice. In the modern era, learners will review current pharmacy institutions and practices, performing a thorough look at the history, purpose and function of the institutions and practices within the profession. The historical context, status, and roles of those who practice pharmacy will also be covered.

Offered: Fall Only

**PHAR 656 - Drug Discovery & Development (3 crs.)**

Learners will explore the steps involved in identifying and developing a novel therapeutic agent from bench to bedside. They will begin with exposure to the various processes that identify lead compounds. The optimization of lead compounds into potential therapeutic agents through preclinical cellular and animal modeling will be examined. Learners will then be guided through the FDA approval process of new compounds and the continued monitoring of approved pharmaceuticals.

**PHAR 657 - Mgmt Acute Overdoses & Poisonings (3 crs.)**

Prerequisite: 2nd/3rd Year Pharmacy (Recommended, Previous).

Learners will become familiarized with the presentation, assessment, and management of acute toxicity from common medications, natural toxins and envenomation, occupational and environmental toxins, chemicals and household products. Learners will engage in case-based activities relative to acute overdose and poisoning. The course will emphasize the role of pharmacists in prevention and management of poisoning.

**PHAR 659 - Drugs of Abuse (3 crs.)**

Prerequisite: 2nd/3rd Year Pharmacy (Recommended, Previous).

A fundamental aspect of the course will be to expose the learners to the impacts that drug abuse have on today's society. Learners will become familiar with the basic history, pharmacology/medicinal chemistry, and withdrawal of the most commonly abused drugs. Learners are expected to present a topic of their choice that integrates the subject matter from two or more of the lectures presented throughout the course.

**PHAR 663 - Pharmaceut Industry in a Global Context (3 crs.)**

Prerequisite: 2nd/3rd Year Pharmacy (Recommended, Previous).

Learners will gain an understanding of drug approval process, role of contract research organizations, principles of pharmaceutical marketing and market access as well as principles of pricing and financing of pharmaceuticals on individual country levels. They will be able to assess the role of innovator and generic pharmaceutical companies in development of breakthrough agents and facilitation of earlier access to lower cost alternatives. In addition, learners will be exposed to the current controversies facing the industry, including loopholes in the regulatory environment delaying earlier generic introductions, ethics of conducting clinical trials in the developing world, deceptive marketing practices and the challenges of medical and regulatory establishments in protecting public health and ensuring patient access to safe and effective medications. The course may be of interest to learners considering careers in pharmaceutical industry, regulatory agencies, managed care organizations, consulting and analytics as well as those interested in gaining insight about the world of pharmaceuticals outside of the walls of community pharmacy.

**PHAR 680 - Professional Development II (0 cr)**

In addition to curricular requirements, learners are required to satisfy professional development requirements. These program requirements have been selected by the College of Pharmacy to foster personal and professional growth and development. Learners will be required to develop and utilize electronic portfolios to document professional experiences (e.g., meetings, activities, assignments), track community service, and reflect upon and assess learning activities and experiences. The learners' academic advisors will review and assess the portfolios and provide the learner feedback. The portfolio requirements for each academic year must be satisfied in order for learners to progress into the next academic year. As directed by the Associate/Assistant Dean for Academic Affairs, learners will meet on campus for portfolio development, assessment activities, and Dean's Seminar. Dean's Seminar provides learners with insight into current pharmacy and health care-related issues through guest presentations.

**PHAR 690 - Special Topics in Pharmacy (3 crs.)**

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

**PHAR 691 - Special Topics in Pharmacy (3 cr.)**

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

**PHAR 692 - Special Topics Pharmacy (3 crs.)**

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

**PHAR 693 - Special Topics Pharmacy (3 crs.)**

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

**PHAR 694 - Special Topics Pharmacy (3 crs.)**

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

**PHARB - PHARMACEUTICAL BUSINESS**

**PHARB 200 - Introduction to Healthcare Industries (3 cr.)**

Prerequisite: Sophomore standing

This course introduces students to the breadth of industries that exist under the broad label of healthcare. The focus of study is understanding the business perspective in the delivery of healthcare-related products and services.

Distribution: MR

Offered: Fall

**PHARB 320 - Pharma & Healthcare Marketing (3 cr.)**

Prerequisite: MK 200/HONB 200

This course explores the application of marketing concepts to the healthcare and pharmaceutical industries. Given in the increasing importance of healthcare industries to the U.S. economy and increased focused on patient-centered approaches to delivery, an understanding of marketing and how firm value is created and maintained is essential.

Distribution: MR

Offered: Fall

**PHARB 333 - Independent Study in Pharmaceutical Business (3 cr.)**

See "Independent Study".

**PHARB 334 - Independent Study in Pharmaceutical Business (3 cr.)**

See "Independent Study".

**PHARB 345 - Fundamentals of Pharmacy (3 cr.)**

Prerequisite: Junior standing and BIO 101 and CHEM 101.

This survey course is intended to develop an appreciation for the three fundamental areas of pharmacy. Areas covered include pharmaceutical aspects, which focuses on the drug discovery and development process; clinical aspects, which focuses on drug utilization, evaluation and therapeutic patient/population management; and administrative/sociobehavioral aspects, which focuses on healthcare delivery - communication, outcomes, regulatory affairs and general business principles.

Offered: Fall

**PHARB 400 - Introduction to Pharmaceutical Analytics (3 cr.)**

Prerequisite: BIS 221 or MATH 120; or instructor permission.

This course introduces students to the application of analytics in the pharmaceutical and healthcare industries. Working closely with

industry standard analytical tools, students investigate the healthcare patient journey from both clinical and business perspectives.

Distribution: MR

Offered: Fall

**PHARB 480 - Internship in Pharma & Healthcare Business (3 cr.)**

Prerequisite: Junior standing

See "Internships".

Distribution: MR

**PHARB 481 - Internship in Pharma & Healthcare Business (1-3 cr.)**

Prerequisite: Junior standing

See "Internships".

Distribution: EL

**PHYS - PHYSICS**

**PHYS 101 - Elements of Physics (3 cr.)**

This is a conceptual, inquiry based introductory survey of physics. It is designed to acquaint the student with typical qualitative reasoning and quantitative methods as encountered in the physical sciences. All subfields of physics will be explored.

Two class hours, three-hour lab.

Laboratory fee \$100.

**PHYS 103 - Elementary Physics (3 cr.)**

This is an elementary non-calculus based course for general students. Kinematic motion, Newton's laws, conservation laws, rotational motion, fluid behavior, and wave motion are discussed.

Offered: in the fall semester

Two class hours, three-hour lab.

Formerly "Elementary Physics I"

Laboratory fee \$100.

**PHYS 110 - Physics of the Human Body (3 cr.)**

This is a basic lab science course for students seeking an introductory understanding of the application of ideas and methods from physics to the human body and medicine. The human body will be the laboratory to learn about energy, forces, motion and flows, electricity, sight and sound and radiation effects. This will be achieved utilizing lectures, demonstrations / discussions and hands-on laboratory activities.

Distribution: MR

Two class hours, three-hour lab.

Laboratory fee \$100.

**PHYS 123 - Physics of the Life Sciences I (4 cr.)**

Prerequisite: MATH 123 or MATH 133

This course is a calculus-based introduction to the fundamental principles of mechanics, thermodynamics, and some nuclear physics covering applications to chemistry, biology, and the life sciences. Emphasis is placed upon problem solving, deduction of solutions from first principles, and simple model building. Students gain an understanding of Kinematics, statics, energy, and momentum, Newton's laws, fluid motion, temperature, heat and thermodynamic laws, and nuclear physics as relevant to medical applications.

Distribution: GUR/MR

Offered: in the fall semester

Three class hours, three-hour lab.

Laboratory fees \$100.

**PHYS 124 - Physics of the Life Sciences II (4 cr.)**

Prerequisite: PHYS 123.

This course is a calculus-based introduction to the fundamental principles of electricity and magnetism, geometric and wave optics, and modern physics covering applications to chemistry, biology and the life sciences. Emphasis is placed upon problem solving, deduction of solutions from first principles and simple model building. Students gain an understanding of electric forces, potentials and currents, electromagnetic induction and light, geometric and wave optics for sound, light and matter, and modern ideas relating to the structure of matter.

Distribution: GUR/MR

Offered: in the spring semester

Three class hours, three-hour lab.

Laboratory fees \$100.

**PHYS 131 - Elements of Mechanics I (3 cr.)**

Corequisite: MATH 109

One unit of secondary school physics is recommended. This is an introductory course dealing with Newton's laws of motion and their applications. Linear and rotational kinematics and dynamics are presented with particular emphasis on the laws of conservation of linear momentum, angular momentum, and energy. Mechanical oscillations are discussed.

Distribution: ER/GUR/MR

Offered: in the fall semester

This course is a prerequisite.

Formerly "Mechanics"

**PHYS 132 - Elements of Mechanics II (4 cr.)**

Prerequisite: PHYS 131, and MATH 131 or MATH 133 or concurrently.

This is a discussion of concepts in mechanics such as linear motion, Newton's laws, energy, momentum, rotation, simple harmonic motion, and waves with an emphasis on problem-solving.

Distribution: ER/GUR/MR

Offered: in the spring semester

This course is a prerequisite.

Three class hours, three-hour lab.

Laboratory fees \$100.

**PHYS 133 - Mechanics (4 cr.)**

Prerequisite: MATH 123, MATH 124, MATH 133, or concurrently.

One unit of secondary school physics is recommended. This is an introductory course dealing with Newton's laws of motion and their applications. Linear and rotational kinematics and dynamics are presented with particular emphasis on the laws of conservation of linear momentum, angular momentum, and energy. Mechanical oscillations are discussed.

Distribution: ER/GUR/MR

Offered: in the fall and spring semesters

This course is a prerequisite.

Three class hours, three-hour lab.

Laboratory fee \$100.

**PHYS 134 - Electricity and Magnetism (4 cr.)**

Prerequisite: PHYS 132 or PHYS 133; MATH 123, MATH 124, or MATH 133.

This course is the study of electrostatics, electric and magnetic fields, DC circuits, electrical measurements, electromagnetism, electrical and magnetic properties of matter, and AC circuits.

Distribution: ER/GUR/MR

Offered: in the fall and spring semesters

Three class hours, three-hour lab.

Laboratory fees \$100.

**PHYS 151 - General Astronomy (3 cr.)**

Prerequisite: PHYS 101, PHYS 103, PHYS 110, PHYS 123, PHYS 132, PHYS 133, METR 101, CHEM 101, CHEM 103, CHEM 105, GEOL 101, BIO 101, or BIO 107 with BIO 117

This is an introductory course designed to acquaint students with an elementary description, in both qualitative and quantitative terms, of the solar system and the behavior and characteristics of the stars and galaxies. (NSP)

Formerly PHYS 113

**PHYS 152 - Energy and Mankind (3 cr.)**

Prerequisite: PHYS 101/PHYS 103/PHYS 105/PHYS 123/PHYS 132/PHYS 133, METR 101, CHEM 101/CHEM 105, GEOL 101, or BIO 101/BIO 103 or BIO 107/BIO 117

This course acquaints students with various sources of energy available to mankind. We will follow the various kinds of energy

from the source to the consumer. We will consider the technical aspects of energy generation and distribution, the environmental and social consequences of use, future potential to benefit mankind, and the fundamental role energy plays in our society. Examples of energy sources to be investigated are nuclear, solar, hydroelectric, geothermal tidal, fossil fuel, wind, and magneto-hydrodynamics. (NSP)

### **PHYS 153 - Space Exploration (3 cr.)**

Prerequisite: PHYS 101, PHYS 103, PHYS 110, PHYS 123, PHYS 132, PHYS 133, METR 101, CHEM 101, CHEM 103, CHEM 105, GEOL 101, BIO 101, or BIO 107 with BIO 117

The goal of this natural science perspective course is to introduce students to the basic principles, issues, and science goals in space exploration, including the history and development of the space program, with particular reference to manned versus unmanned space exploration, spacecraft design, launch and navigation, imaging and remote sensing. Public perception of space science and analysis of the costs, risks and benefits of space exploration will be discussed, including reference to ethical and legal implications of topics such as the use of radioisotope fuel sources, 'space junk', and mining rights in space. Basic concepts from physics and astronomy will be covered as needed. (NSP)

### **PHYS 154 - Oceans (3cr.)**

Prerequisite: PHYS 101, PHYS 103, PHYS 110, PHYS 123, PHYS 132, PHYS 133, METR 101, CHEM 101, CHEM 103, CHEM 105, GEOL 101, BIO 101, or BIO 107 with BIO 117

The goal of this natural science perspective course is to provide students with a focus for better understanding and appreciating the oceans as a key part of the overall Earth environment. Students will gain background knowledge useful for evaluating future societal issues including global climate changes and pollution. Scientific information from geology, chemistry, physics, and biology will be incorporated to illustrate how each of these disciplines relates to the ocean. Topics covered in this course will include plate tectonics and the ocean floor, chemical properties of seawater, ocean circulation, waves and water dynamics, tides, ocean ecosystems, and marine life. (NSP)

### **PHYS 155 - Meteorology (3 cr.)**

Prerequisite: PHYS 101, PHYS 103, PHYS 110, PHYS 123, PHYS 132, PHYS 133, CHEM 101, CHEM 103, CHEM 105, GEOL 101, BIO 101, or BIO 107 with BIO 117

This is an introductory course in meteorology for the nontechnical student. Topics include the earth-sun system, the earth's atmosphere, the earth's heat budget, weather measurements, clouds, horizontal air movement, stability, fronts, short-term weather forecasting, and climate. (NSP)

### **PHYS 156 - Sound and Music (3 cr.)**

Prerequisite: Any of following: PHYS 101, PHYS 103, PHYS 110, PHYS 123, PHYS 132, PHYS 133, METR 101, CHEM 101, CHEM 103, CHEM 105, GEOL 101, BIO 101, or BIO 107 with BIO 117

This course provides an introduction to the physical aspects of musical sound. The goal of this natural sciences perspectives course is to provide course participants with a theoretical understanding of the physical basis of musical sound allowing for further research, music-making, or appreciation as listeners. Beginning with the physical properties of sound waves such as wave speed, frequency and amplitude, we will examine how these affect musical concepts of

pitch, timbre, mode, and consonance/dissonance. We will look at mechanisms of sound production in various musical instruments and explore the effects of auditorium acoustics, electronic enhancement, and sound recording and reproduction, looking at the variety of ways in which physical phenomena are used to create music. (NSP)

### **PHYS 190 - Special Topics in Physics (1-3 cr.)**

Topics in physics that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **PHYS 290 - Special Topics in Physics (1-3 cr.)**

Prerequisite: Sophomore standing.

Topics in physics that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **PHYS 301 - Optics (3cr.)**

Prerequisite: PHYS 124 or PHYS 134

This course is designed to provide juniors (and seniors) in engineering and the sciences with a solid foundation in optics and its applications. Specific topics covered are the theory and application of geometrical optics, fiber optics, optical instrumentation, electromagnetic waves, interference, diffraction, polarization, photon theory of light, and the basic principles and applications of lasers. Laboratory activities are used throughout the course to explore and emphasize important concepts.

Offered: spring semester in odd years

### **PHYS 310 - Forensic Physics (3cr.)**

Prerequisite: PHYS 123 or PHYS 133

This course focuses on the application of basic physics concepts to Forensic Science with an emphasis on the quantitative analysis of real and contrived cases. It will expose the students to actual methods and techniques used by investigators in the field of Forensic Physics. The science of physics is especially important when dealing with ballistic evidence where the trajectory of a bullet is in question (kinematics). Physics is needed to aid in accident reconstruction, resolving the many different forces at work in order to explain how an event may have happened (Newton's laws, collisions, energy). Other topics are, e.g., the physics of explosions and arson (thermodynamics), analysis of bloodstain patterns (kinematics), and the use of physical and geometric optics principles to develop latent fingerprints.

Formerly ILP 237 Forensic Physics

### **PHYS 320 - Modern Physics (3cr.)**

Prerequisite: PHYS 124 or PHYS 134; and MATH 124 or MATH 134

This course is an introduction to two great accomplishments of 20th century physics: Relativity and Quantum Mechanics. These theories are more difficult to understand than classical Newtonian physics because they usually relate to situations beyond our everyday experience, specifically velocities close to the speed of light and extremely small distances. Standard topics in Special Relativity will be covered including time dilation, length contraction, and the twin paradox. The basics of Quantum Mechanics will be introduced including the quantization of matter and energy, atomic structure, the Schrödinger Equation, and the hydrogen atom.

Offered: spring semester in even years

Formerly PHYS 206

**PHYS 333 - Independent Study in Physics (1-3 cr.)**

See "Independent Study".

Laboratory fees may be required.

**PHYS 334 - Independent Study in Physics (1-3 cr.)**

See "Independent Study".

Laboratory fees may be required.

**PHYS 390 - Special Topics (1-3 cr.)**

Prerequisite: Junior standing.

Topics in physics that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

**PHYS 440 - Undergraduate Research (1-3 cr.)**

Prerequisite: Permission of the Department, approval of the dean.

See "Undergraduate Research". Students who show an interest and aptitude for independent and creative work may engage in undergraduate research. Students are expected to write a report based on this work. Class hours by arrangement.

Laboratory fees maybe required.

**POSC - POLITICAL SCIENCE**

**POSC 101 - Introduction to Contemporary Global Issues (3 cr.)**

Cross-Listed as: INST 101

The course examines numerous social, cultural, economic, and political issue areas from the vantage points of global community and global citizenship. Areas such as the regulation of business, the spread of technology, environmental pollution, health, poverty, crime, human rights, immigration, education, and democracy as well as war and peace are analyzed within the context of globalization.

Distribution: MR

This course is a prerequisite.

**POSC 102 - American National Government (3 cr.)**

This course is an introduction to national-level politics in the United States that emphasizes learning concepts and tools of analysis. Students will study the basic structure of the U.S. Constitution and the system of government that it establishes. This will include an examination of federalism, government institutions, and themes associated with citizen participation. Emphasis will also be placed on analyzing current political events.

Distribution: A&SR/GUR/MR

This course is a prerequisite.

**POSC 190 - Special Topics in Political Science (1-3 cr.)**

Topics in political science that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

**POSC 201 - Comparative Politics (3 cr.)**

Prerequisite: POSC 101 or INST 101 or POSC 102 or sophomore standing.

This is an introduction to basic concepts of comparative political analysis. An appreciation for the diversity of political systems across the world is emphasized through case studies taken from Europe, Latin America, Asia, and Africa.

Distribution: MR

**POSC 203 - International Relations (3 cr.)**

Prerequisite: POSC 101 or INST 101 or POSC 102 or sophomore standing.

This is an introduction to the elements essential for analyzing and understanding international behavior, organization, diplomacy, politics, law, and the multistate system.

Distribution: MR

This course is a prerequisite.

**POSC 205 - Public Administration (3 cr.)**

Prerequisite: POSC 101 or INST 101 or POSC 102 or sophomore standing.

This is an introduction to public administration both as a field of study and in its practical applications in government. Areas of study include bureaucratic organization, budgeting, and public management. Problems of public service delivery are explored in relation to the contemporary American political scene.

Distribution: GUR/MR

This course is a prerequisite.

**POSC 207 - Introduction to Political Theory (3 cr.)**

Prerequisite: POSC 101, or INST 101, POSC 102, three credit hours of European history or sophomore standing.

Cross-Listed as: LSOC 207 and PH 207

Survey course designed to introduce students to major political thinkers and schools of thought with an emphasis on classical liberalism and the social contract tradition

Distribution: MR

Offered: in fall

formerly Western Political Thought

**POSC 209 - American Political Thought (3 cr.)**

Prerequisite: POSC 102.

This is a study of American political thinkers from the colonial period to the 20th century.

**POSC 210 - State and Local Politics (3 cr.)**

Prerequisite: POSC 101 or INST 101 or POSC 102 or sophomore standing.

This is a general survey of politics in state and local government. Topics given special consideration include the power of governors and mayors, variations in state/local legislative assemblies, budgeting and taxation issues, intergovernmental relations, citizen ballot initiatives, and policy issues including education, criminal justice, the environment, transportation, and public welfare.

Distribution: MR

Formerly State Politics in America

**POSC 212 - Political Analysis (3 cr.)**

Prerequisite: POSC 102 and sophomore standing.

This course will introduce students to the ways in which scholars try to systematically describe and explain political phenomena. How is the study of politics a science? How do political scientists develop hypotheses and test them in such areas as citizen participation, the effects of news media and campaign ads on political attitudes, and the behavior of legislators, governors, and presidents in policy-making? The course will cover the elements of research design as well as survey, experimental, and qualitative approaches to the study of politics. Students also will learn how to analyze data using descriptive statistics, t-tests, correlations, and multiple regression.

### **POSC 218 - Public Policy in America (3 cr.)**

Prerequisite: POSC 102.

This is an examination in the setting of American politics of the process surrounding public decision-making and implementation. Attention is devoted to specific policy issues (environment, healthcare, education, etc.) and the way in which these are addressed in the public sector by interest groups, bureaucrats, and elected politicians.

Distribution: MR

This course is a prerequisite.

### **POSC 225 - Law and Judicial Politics (3 cr.)**

Prerequisite: POSC 102.

Cross-Listed as: LSOC 225

This course will explore the basic principles and categories of American law, its processes and institutions. We will look at the legal profession, the guardians of the law, from their education to their roles in the legal system, and we will examine our courts and judges and the politics that surround their work.

Not open to students w/POSC 325, POSC 326 or CJ 234.

### **POSC 226 - The Legal Profession (3 cr.)**

Prerequisite: POSC 101, POSC 102, INST 101, LSOC 101, LSOC 102, CJ 101, or Sophomore standing.

Cross-Listed as: LSOC 226

LSOC 226/POSC 226 introduces the legal profession from the perspective of both law practitioners and the social sciences; provides an inside view of the practice of law as well as social science perspectives on the role of the lawyer in society; considers issues associated with access to justice, legal ethics, and cause-lawyering among others; clarifies the connections between the goals of liberal education, on the one hand, and legal education, on the other; and compares and contrasts the values, perspectives, and assumptions of social science and ethics with those of the legal profession.

Offered: Spring Only

### **POSC 235 - British Press and Politics (3 cr.)**

Cross-Listed as: COMM 235

This course examines the interaction between British news media and the national government. Students of American media and politics may be surprised to learn that the constitutional guarantee of free press that Americans take for granted is not codified in a single document in Great Britain. Instead, the media-government relationship has evolved over time largely through practice, with print media today policing themselves through the Independent Press Standards Organisation and electronic media laboring under tighter

government control. We will examine the relationship between British media and government in comparison with their counterparts in the United States. The course will consist of a mix of lecture notes, class discussions, case studies and field trips. Students will complete short homework assignments and quizzes while in London, and they will submit a more in-depth research paper after they return to the United States.

This course satisfies the Social/Behavioral Science perspective requirement. This course can also be taken at the 300-level with permission of instructor.

Taught in summer session in London.

### **POSC 290 - Special Topics in Political Science (1-3 cr.)**

Topics in political science that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **POSC 307 - When Cultures Collide (3 cr.)**

Prerequisite: Junior or Senior standing.

Cross-Listed as: LSOC 307

LSOC 307/POSC 307 examines how contemporary liberal democracies can and should come to terms with issues of national, cultural, ethnic, religious, and racial diversity. The course considers (1) whether, under what conditions, and to what extent national, cultural, ethnic, religious, and racial minorities can and should be accommodated, integrated, and/or assimilated in society and (2) to what extent (and in what ways) the state can and should promote a particular ideal of liberal democratic citizenship.

Offered: in spring

Formerly POSC 230

### **POSC 310 - Politics of Developing Societies (3 cr.)**

Prerequisite: POSC 101 or INST 101 or POSC 102 and junior standing.

This is a study of the developing societies of the world in the context of rapidly changing socioeconomic conditions and competing political ideologies. Objectives center on a consideration of the cyclical dynamics of democracy and authoritarianism, the rise of revolutionary pressures, and the role of the international economy in shaping domestic politics.

Distribution: MR

### **POSC 312 - Politics of Sub-Saharan Africa (3 cr.)**

Prerequisite: POSC 101 or INST 101 or POSC 102 and junior standing.

This is a study of the modern state in Africa, tracing it from colonial origins to the present with a focus on challenges of plural ethnic societies. Thematic content reflects the comparative influence of authoritarianism, and economic underdevelopment shared by all of these societies.

Formerly Politics of Ethnic Conflict: Africa

### **POSC 316 - Politics of Europe (3 cr.)**

Prerequisite: POSC 101 or INST 101 or POSC 102 and junior standing.

This is an analysis of the governmental and party structures of Great Britain, France, Germany, and Russia with comparisons to the United States. Special attention paid to European Union institutions.

Distribution: MR

### **POSC 318 - Politics of The Middle East (3 cr.)**

Prerequisite: POSC 101 or INST 101 or POSC 102 and junior standing.

This is a study of the Middle East and North Africa in terms of the shared traditions of Arabic and Islamic culture, authoritarianism, and foreign intervention. Specific issues discussed include the Palestinian-Israeli conflict, the Persian Gulf, Islamic fundamentalism, terrorism, and the impact of oil production.

### **POSC 321 - The U.S. Congress (3 cr.)**

Prerequisite: POSC 102 and junior standing.

This course introduces the world of legislative politics on Capitol Hill, including the people who serve there, congressional organization and procedure, Congress's relationship to other institutions like the President and the courts, and its struggle to solve, while reflecting, the nation's most difficult problems. Students who have successfully completed POSC 320 cannot receive credit for this course.

### **POSC 322 - The U.S. Presidency (3 cr.)**

Prerequisite: POSC 102 and junior standing.

This course examines the history of the Presidency, but the focus is on the office in its current form. Topics include presidential management of the media and public opinion, decision-making in the White House and the President's interaction with other governmental institutions.

### **POSC 324 - Parties and Elections (3 cr.)**

Prerequisite: POSC 102 and junior standing.

This is a study of the electoral process including the roles of candidates, parties, and political managers. Course exercises relate to current campaigns and elections.

### **POSC 325 - Constitutional Law (3 cr.)**

Prerequisite: POSC 102 and POSC 225 or CJ 234

Cross-Listed as: LSOC 325

This is a study of constitutional principles as decided by the U.S. Supreme Court. Emphasis is on the Court's roles as arbiter of federalism and separation of powers and interpreter of the Bill of Rights and the Civil War Amendments.

Distribution: MR

### **POSC 326 - Civil Liberties (3 cr.)**

Prerequisite: POSC 102 and Junior Standing

This is a further study of constitutional law focusing on the First Amendment to the U.S. Constitution (Freedom of Speech, Press, and Religion). A secondary focus is on civil rights, affirmative action, and reproductive rights cases.

Distribution: MR

### **POSC 327 - Media & Politics (3 cr.)**

Prerequisite: POSC 102, and Junior or Senior Standing.

This class will address the role the media play in our democracy. We will discuss the responsibilities citizens have in a democracy and whether the media help or hinder citizens in living up to those responsibilities. Over the course of the semester, we will examine the interplay between political actors, the media, and citizens and examine the consequences these interactions have for the democratic process. The course will focus on traditional news media such as newspapers, television news broadcasts, radio and the Internet, as well as social media and other rapidly evolving forms of political communication. We will also look carefully at campaign communication and consider how well it helps citizens make informed voting decisions.

Distribution: MR

### **POSC 328 - Political Behavior (3 cr.)**

Prerequisite: POSC 102, and Junior or Senior Standing.

The course examines the motivations and reasoning behind American political behavior. How do we become socialized to play our role as citizens in a representative democracy? How do we process information about politics? From where do our opinions originate? Are we consistent in our political attitudes, partisanship and ideology? How do government officials, political parties and the news media influence our attitudes and behavior? We will explore these questions by drawing from theoretical and empirical work in political science, as well as from psychology and communications.

Distribution: MR

### **POSC 329 - Political Polling (3 cr.)**

Prerequisite: POSC 102, and Junior Standing

Polling is a central part of political campaigns. Candidates use public opinion data to shape their message, their campaign ads, and sometimes issue positions. This course

examines how pollsters measure voters' perceptions of candidates and issues, and how candidates use polling data to adjust their message and strategy in the heat of a campaign. The course also will examine how voters form their political views and how best to measure those attitudes in a dynamic campaign environment. Students will take on the role of campaign consultant, and will "advise" candidates by drafting strategy memos during an election cycle and by providing a final post-election analysis of the outcome of the race.

Distribution: MR

Not open to students w/POSC 390 (Fall 2020) or ILP 310

Satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **POSC 333 - Independent Study in Government (1-3 cr.)**

See "Independent Study".

### **POSC 334 - Independent Study in Government (1-3 cr.)**

See "Independent Study".

### **POSC 340 - International Governance and Law (3 cr.)**

Prerequisite: POSC 101 or INST 101 or POSC 102 and junior standing.

Cross-Listed as: LSOC 340

This is analysis of international law and organization in the 20th century. Special attention is paid to landmark cases and principles as well as to the structure and processes of the United Nations, European Community, and other experiments in international organization.

Distribution: MR

Formerly "International Law and Organization"

### **POSC 342 - Environmental Politics (3 cr.)**

Prerequisite: POSC 102 and junior standing.

This is an examination of how political institutions have addressed the issues of environmental quality, waste management, clean air, and energy policy. The focus of the course will be on environmental politics in the United States.

Distribution: A&SR/MR

### **POSC 345 - International Human Rights (3 cr.)**

Prerequisite: POSC 101 or INST 101 or POSC 102 or LSOC 101, or permission of instructor.

This course offers a comprehensive introduction to the politics, law, institutions and actors of international human rights. Among the areas to be discussed are theories of rights; the history and practice of international human rights standards, instruments, and institutions; critiques of international human rights; and a variety of specific human rights issues, such as torture, war crimes child soldiers, women's rights and religious freedom.

This course satisfies one of the Writing Intensive Course requirements for Arts and Sciences students.

### **POSC 346 - Politics and the European Union (3 cr.)**

Prerequisite: POSC 101 and Junior standing.

The course offers a look at international politics at an advanced level of analysis, and is intended for those Political Science, International Studies, and History majors who have had previous exposure to related subjects at the Freshman and Sophomore level. Students who successfully complete the requirements of this course will have a broader understanding of trends and development in international politics and Europe.

### **POSC 350 - American Foreign Policy (3 cr.)**

Prerequisite: POSC 101 or INST 101 or POSC 102 and junior standing.

This is an analysis of American foreign relations. The emphasis is on the formulation and consequences of foreign policy as well as the role of diplomacy abroad and in the United Nations.

### **POSC 356 - Human Security (3 cr.)**

Prerequisite: POSC 101 or INST 101 or POSC 102 and junior standing.

Human security is an emerging paradigm in political science and international relations. The human security concept was first coined in the 1994 United Nations Development Programme seminal publication titled: The Human Development Report. The human security concept is broader than our traditional security framework, which is state-centric and focused on the physical protection of state boundaries from external (and internal) military threats. Human security, by contrast, is focused on the individual and the protection of individuals from a plethora of challenges, many of which result

from a more interconnected, globalized world. As such, the human security paradigm engages nontraditional security concerns including environmental degradation, human displacement, economic insecurity, communicable disease, and cyber threats.

With the end of WWII and the collapse of cold war bipolarity, the international community has witnessed a decline in armed conflict; however, the absence of conflict does not mean we live in a more peaceful world and the most recent Human Security Report signals an increase in human insecurity, which is a troubling trend. The goal of this course is to further explore the causes and consequences of human insecurity as well as potential solutions that can promote a more peaceful and comfortable world for individuals.

### **POSC 390 - Special Topics in Political Science (1-3 cr.)**

Prerequisite: POSC 101 or POSC 102 and junior standing.

Topics offered depend upon student interest as well as particular interests of instructors. The course is offered as often as faculty time and student interest permit. Recent topics have included "Ethnic and Minority Politics", "Politics and Religion", and "Liberalism versus Conservatism." May be repeated for credit if topic differs.

### **POSC 480 - Internships in Political Science (1-3 cr.)**

See "Internships".

### **POSC 481 - Internships in Political Science (1-3 cr.)**

See "Internships".

### **POSC 490 - Seminar in Political Science (4 cr.)**

Prerequisite: Senior standing and 15 credit hours of political science or permission of instructor.

This is an exploration of selected topics in political science with an emphasis on developing research and analytical skills. These skills are incorporated into a research project on a topic selected by the student. This course may be repeated if the topic differs. All senior political science majors are required to enroll in this course.

Distribution: MR

From 3 credits to 4 credits in Fall'19.

## **PSY - PSYCHOLOGY**

### **PSY 101 - Introduction to Psychology (3 cr.)**

This is a survey of the primary topics of psychology including its historical evolution, aims and research methods. Topics include the scientific study of biopsychosocial bases of thought, feelings, and behavior, social determinants, and applications of psychology in various fields of human activity.

Distribution: A&SR/BUSR/GUR/MR

This course is a prerequisite.

### **PSY 150 - Introduction to Psychology Research (1 cr.)**

Prerequisite: Permission of the chair.

In this course the student will become familiar with basic research techniques, design, and protocols conducted in the laboratory, as well as with the ethics of research procedures.



**PSY 151 - Introduction to Psychology Research II (1 cr.)**

Prerequisite: Permission of the chair.

In this course the student will become familiar with basic research techniques, design, and protocols conducted in the laboratory, as well as with the ethics of research procedures.

**PSY 190 - Special Topics in Psychology (1-3 cr.)**

Topics in psychology that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

**PSY 201 - Developmental Psychology (3 cr.)**

Prerequisite: PSY 101, or permission of the chair.

This is a study of behavior changes from infancy through adulthood. Topics examined include prenatal development and the development of motor, perceptual, social, emotional, and cognitive behavior. The interaction of genetic, physiological, and environmental variables at each stage is considered. Topics of contemporary interest such as developmental disabilities, parenting, and education are briefly considered.

Distribution: MR

**PSY 207 - Statistics for the Behavioral Sciences (3 cr.)**

Prerequisite: MATH 100 or higher, or permission of the chair.

This is an introduction to the descriptive and inferential techniques for presenting, analyzing, and interpreting data gathered in the social sciences. Topics include correlation and regression; sampling and sampling distributions; hypothesis testing; and tests of significance, including t tests, ANOVA, effect size, and SPSS.

Distribution: MR

**PSY 212 - Adolescent Development (3 cr.)**

Prerequisite: PSY 201 or concurrently, or permission of the chair.

This course explores the adolescent experience through the examination of a variety of theories that look at physical, emotional, and intellectual development, and also the domains of family life, peer relationships, schooling, community, and cross-cultural experience.

**PSY 214 - Social Psychology (3 cr.)**

Prerequisite: PSY 101, or permission of the chair.

This is a study of the individual in society including interactions and relationships with group members. The emphasis is on sociocultural factors affecting attitudes and behavior. Topics include motivation, beliefs, prejudice, discrimination, interpersonal perceptions and communication, aggression, prosocial behavior and relationships.

Distribution: MR

**PSY 220 - Health Psychology (3 cr.)**

Prerequisite: PSY 101, or permission of the chair.

This course explores the relationship between psychological factors and physical and mental health. Included will be discussions of stress reactivity, psychoneuroimmunology, the role of cognitive behavior, stress hardiness, and prevention. Students will also learn and practice a variety of intervention protocols, including the relaxation response.

**PSY 222 - Positive Psychology (3 cr.)**

This course presents an introduction to the core assumptions and research findings associated with human strengths and positive emotions, then move on to explore interventions and applications informed by this perspective in counseling and psychotherapy, as well as in domains personally relevant to the lives of students such as school, work, family and other close relationships.

**PSY 224 - Cognitive Psychology (3 cr.)**

Prerequisite: PSY 101, or permission of chair.

This course examines the major subject areas of cognitive psychology including perception, attention, memory systems and processes, problem solving, decision making, reasoning, as well as memory errors, eyewitness testimony, and abnormal behavior.

**PSY 250 - Intermediate Psychology Research (1-3 crs.)**

Prerequisite: Permission of the chair.

In this course the students will increase their knowledge and skills in general research protocol, ethics, and techniques by assisting one of our faculty with their research in designing and performing experiments.

Variable credit course - 1 to 3 credits.

**PSY 251 - Intermediate Psychology Research II (1-3 crs.)**

Prerequisite: Permission of the chair.

In this course the students will increase their knowledge and skills in general research protocol, ethics, and techniques by assisting one of our faculty with their research in designing and performing experiments.

Variable credit course - 1 to 3 credits.

**PSY 289 - Issues in Adolescence (3 cr.)**

Prerequisite: Sophomore standing

Cross-Listed as: ILP 389

Students will be introduced to theories of adolescent development to prepare them for a practical experience working in an alternative high school environment. This experience will include the opportunity to observe, teach, advise, assess, counsel, and interview at-risk youth.

Formerly PSY 389

**PSY 290 - Special Topics (1-3 cr.)**

Topics in psychology that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

**PSY 302 - Organizational Psychology (3 cr.)**

Prerequisite: PSY 101 and junior standing, or permission of the chair.

This is a study of the behavior of individuals within complex social systems. The focus is upon groups and their responses to various organizational structures. Concerns of the industrial psychologist, recruitment, selection, training, and incentives are also treated.

**PSY 303 - Personality Psychology (3 cr.)**

Prerequisite: Junior PSY major, completed PSY 101 and 2xx-level Writing Intensive course; or permission of the chair.

Personality Psychology is the scientific study of the various internal, underlying causes of attitudes, behavior and experience. The course examines the most prominent personality theories within the field of Psychology in order to highlight commonalities and differences between these perspectives and to gain a better appreciation of factors contributing to human personality. Since this course qualifies as a writing intensive experience, a significant amount of time will be dedicated to researching, developing and submitting a 20 page polished APA-style theoretical paper on a topic relevant to existing personality theory.

This course satisfies one of the Writing Intensive Course requirements for the Arts and Sciences students.

### **PSY 304 - Educational Psychology (3 cr.)**

Prerequisite: PSY 101 and Sophomore standing, or permission of the chair.

This is a psychological analysis of the educational process with special attention to the nature of learning and the classroom environment. Topics examined include cognitive and emotional development, learning theory, social adjustment, as well as current educational issues affecting learning and development.

Distribution: MR

### **PSY 305 - Psychology of Women (3 cr.)**

Prerequisite: PSY 101 and Sophomore standing, or permission of the chair.

This is an examination of the social, cultural, political, and biological influences on female development, attitudes, relationships, and other behavior. The course also considers the cultural and historical significance and validity of gender expectations in the development of women.

### **PSY 307 - Psychological Assessment (3 cr.)**

Prerequisite: PSY 101 and PSY 207 or BIS 220 or the equivalent, or permission of the chair.

This course considers the application of the basic principles associated with psychological tests and assessment measures as a systematic means of sampling, describing, and understanding individual behavior. Tests of ability, achievement, aptitude, and personality are presented along with the importance of situating test results within a broader ecological framework. Additional topics include historical considerations, continuing controversies, collection and evaluation of observational data, basic principles of test construction, and appropriate test selection.

### **PSY 309 - Research Methods (3 cr.)**

Prerequisite: PSY 101, and PSY 207 or concurrent, or permission of the chair.

This is a study of the methodology of psychological research from the conception of a hypothesis to the publication of the results. Attention is given to the advantages and limitations of various research designs, the ethical guidelines of research, and the writing style requirements (APA) for psychology papers.

Distribution: MR

### **PSY 310 - Research Methods II (3 cr.)**

Prerequisite: PSY 309, or permission of the chair.

This course is a continuation of PSY 309. Students undertake a critical review of a research area of their choice and design an original research proposal based on their findings and ethical principles of the American Psychological Association. The proposals are presented as papers written in the style of the American Psychological Association and as posters.

### **PSY 311 - Child Behavior Management: Theory and Practice (3 cr.)**

Prerequisite: PSY 313, or permission of the chair.

This is an examination of the basic principles of behavior management with children. Emphasis is on the practical application of learning principles and communication theory with the goal of developing psychologically healthy relationships between parents, or other caregivers, teachers, and children. Topics include how to communicate effectively with a child, how to reward appropriate behavior, how to use token systems, time-out, and other strategies for dealing with disruptive or other inappropriate behavior in the family, school setting, or clinic.

### **PSY 313 - Learning (3 cr.)**

Prerequisite: PSY 101 and PSY 201, or permission of the chair.

This is an examination of the theoretical principles of operant and respondent conditioning using human and comparative studies from laboratory, educational, and therapeutic settings.

Distribution: MR

### **PSY 315 - Cultural Psychology (3 cr.)**

Prerequisite: PSY 101 and Sophomore standing, or permission of the chair.

This is a culture sensitive approach to the development of individuals and groups in various cultural settings. The emphasis is on cultural diversity and its influence upon various psychological processes at both the individual and collective levels.

### **PSY 317 - Psychology of the Exceptional Person (3 cr.)**

Prerequisite: PSY 101 and junior standing, or permission of the chair.

This is a survey of the unique needs and problems of exceptional people including those who have mental retardation, learning disabilities, autism, giftedness, sensory handicaps, cultural disadvantages, and emotional disturbance, as well as those who belong to multiple categories of exceptionality. The course extends beyond identification criteria and treatment and considers these individuals as they function in, influence, and are influenced by their families, schools, and larger cultural contexts.

### **PSY 319 - Forensic Psychology (3 cr.)**

Prerequisite: PSY 101 and junior standing, or permission of the chair.

In this course, principles and theories of psychology as they apply to the civil and criminal justice systems will be studied. Topics of investigation will include: role and responsibilities of forensic psychologists, criminal profiling, lie detection, police interrogation and confession, insanity, domestic violence, sexual abuse, the death penalty, and public policy.

### **PSY 321 - Sports Psychology (3 cr.)**

Prerequisite: PSY 101 and junior standing, or permission of the chair.

This course focuses on psychological theories and interventions used to research and enhance sports performances, the social psychological aspects of sports, and the psychological effects of participating in sports and exercise programs.

### **PSY 322 - School Psychology (3 cr.)**

Prerequisite: PSY 101 and PSY 201 or permission of the chair.

This course is designed to introduce students to the field of school psychology. Students will gain an understanding of the various roles and functions of school psychologists, as well as changes and challenges in school psychology training and practice. Other topics include the history of the field, role of professional organizations, multicultural assessment in the schools, and ethics and law for school psychologists.

### **PSY 323 - Applied Behavior Analysis (3 cr.)**

Prerequisite: PSY 313, or permission of the chair.

This is an application of the principles of learning theory to behavior change with specialized populations and a variety of behavior disorders. This course includes a number of practicum exercises, an individualized self-adjustment project and paper, and several class presentations.

### **PSY 324 - Drugs and Behavior (3 cr.)**

Prerequisite: PSY 313 and NSCI 212, or permission of the chair.

This is a course in behavioral pharmacology with an emphasis on examining the pharmacokinetics and behavioral effects of recreational and prescribed psychoactive drugs.

### **PSY 326 - Abnormal Psychology (3 cr.)**

Prerequisite: PSY 101 and junior standing, or permission of the chair.

The concept of abnormality is considered from a perspective that views the contribution of both constitutional factors and life experiences to the manifestation of behavioral disorders. Major categories of disorders, relevant research findings, various theoretical orientations, and treatment options are presented. Within these topics, attention is paid to the importance of such forces as culture, race, ethnicity, gender, age, and socioeconomic status as they relate to our understanding of normal and abnormal development.

Distribution: MR

### **PSY 327 - Multicultural Psychology (3 cr.)**

Prerequisite: Junior standing, or permission of the chair.

This course is designed for students who are interested in social justice and multi-cultural issues, especially those issues that foster and nurture tolerance and combat the culture of violence and hatred that can permeate society.

Formerly "The Psychology of Tolerance, Social Justice and Hate Crimes"

### **PSY 331 - Conservation Psychology (3 cr.)**

Prerequisite: PSY 101 and PSY 214 or permission of the chair.

Conservation psychology is the scientific study of the reciprocal relationship between humans and nature. This course will immerse students in current psychological theory and research as it pertains to understanding human conservation behavior, methods to modify negative environmental behavior, and research related to

understanding the human impact on nature and nature's impact on humans.

### **PSY 332 - Community Psychology (4 cr.)**

Prerequisite: PSY 101 and junior standing, or permission of the chair.

Community psychology is an applied area of psychology that studies the real-world interaction between the individual and their community. Social issues and social policy play an integral role in an individual's health and well-being. This course emphasizes citizen participation and empowerment, social change, social justice, program evaluation and program development. Utilizing a service learning framework students will engage in a community program/project to experience the course material in action.

Formerly 3 credits, changed to 4 credits as of Fall'19 semester

### **PSY 333 - Independent Study in Psychology (1-3 cr.)**

See "Independent Study".

### **PSY 334 - Independent Study in Psychology (1-3 cr.)**

See "Independent Study".

### **PSY 350 - Advanced Psychology Research (1-3 crs.)**

Prerequisite: Permission of the chair.

In this course the students will further increase their knowledge and skill level of general research techniques, design, protocols and ethical procedures. The student will conduct research more independently; assist in the training and supervision of other students; and read, comprehend, and provide a synopsis of relevant research articles.

Variable credit course - 1 to 3 crs.

### **PSY 351 - Advanced Psychology Research II (1-3 crs.)**

Prerequisite: Permission of the chair.

In this course the students will further increase their knowledge and skill level of general research techniques, design, protocols and ethical procedures. The student will conduct research more independently; assist in the training and supervision of other students; and read, comprehend, and provide a synopsis of relevant research articles.

Variable credit course - 1 to 3 crs.

### **PSY 352 - Advanced ABA Research: Designing Healthy Environments for Young Children (4 cr.)**

Prerequisite: PSY 309 and PSY 313 or permission of the chair.

This course will involve students in the implementation and evaluation of evidence-based practices as they work with local teachers in developing academically and socially significant behavior of young children in local schools, culminating in a professional poster or manuscript describing a scientifically-sound behavioral intervention.

### **PSY 353 - Advanced ABA Research: Designing Healthy Environments for Young Children II (4 cr.)**

Prerequisite: PSY 352 or permission of the chair.

This course will involve students in the implementation and evaluation of evidence-based practices as they work with local

teachers in developing academically and socially significant behavior of young children in local schools, culminating in a professional poster or manuscript describing a scientifically-sound behavioral intervention.

### **PSY 356 - Advanced Social Psychology Research (4 cr.)**

Prerequisite: PSY 214 and PSY 309 or permission of the chair.

This course will further expose students to theory and research in social psychology. A significant component of this course will be exposure to and participation in all aspects of the social psychological research process, culminating in an APA style research proposal, presentation, or poster. Topics include, but are not limited to: stereotype threat, prejudice and discrimination, attribution theory, and social-cognitive models of behavior. (e.g., theory of planned behavior, health belief model, etc.)

### **PSY 358 - Advanced Cognitive Psychology Research (4 cr.)**

Prerequisite: PSY 309 and PSY 313 or permission of the chair.

This is an advanced examination of the basic research and theories in learning, human memory and cognition and their applications to human behavior, culminating in an APA style research proposal, presentation, or poster. Topics include operant and respondent conditioning, memory, cognitive theory, conceptual behavior, and biological influences on learning, memory, and cognition.

### **PSY 388 - Sexuality and Sexual Assault in our Society (3 cr.)**

Prerequisite: Sophomore standing.

Cross-Listed as: former ILP 388

The first half of this course examines the complex interplay of psychological, sociocultural, and biological factors in the development and expression of sexual attitudes and behaviors. We will cover a wide variety of topics, including the major psychological theories of sexuality, the development of gender and gender identity, variations in sexual orientation, attraction processes and romantic love, sexual dysfunctions and sex therapy, and atypical sexual behaviors. The second half of this course examines sexual assault, including its incidence across a wide variety of contexts, its biopsychosocial impact, societal reactions to sexual assault including how criminal cases are handled in the justice system, and sexual violence prevention. The course will use a combination of research literature, textbook material, and popular literature to promote and discuss these topics.

### **PSY 390 - Special Topics (1-3 cr.)**

Topics in psychology that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **PSY 414 - Conditioning and Learning Lab (3 cr.)**

Prerequisite: PSY 313, or permission of the chair.

The basic principles of operant conditioning are demonstrated using standard operant conditioning equipment with rats covering unconditioned and conditioned reinforcement, extinction, shaping, schedules of reinforcement, discrimination training, and behavior chaining. The care and ethical treatment of laboratory animals and the extension of these principles to the behavior of organisms outside the laboratory are covered. Students will be required to prepare an APA formatted paper based on their experimental results.

### **PSY 416 - Counseling Skills (3 cr.)**

Prerequisite: Senior standing in Psychology or permission of the chair.

This is a survey of personality and counseling theory and the development of counseling skills. Through the extensive use of modeling, role playing, and video playback, students learn the skills of counseling. The emphasis is on the integration of theories, skills, and practice of counseling. Students will prepare weekly reaction papers on each of the major personality theories of counseling and psychotherapy covered.

### **PSY 418 - Behavioral Counseling Methods (3 cr.)**

Prerequisite: PSY 313 and PSY 416 or permission of the chair.

This is a survey of current, empirically supported methods of behavioral and cognitive-behavioral counseling. The emphasis is on helping clients change their behavior. Case materials include examples from a wide range of settings and client characteristics. Students will be required to prepare an APA formatted paper based on an extensive literature review.

### **PSY 420 - History of Psychology (3 cr.)**

Prerequisite: PSY 101 and Junior standing in Psychology

This capstone course is an examination of the history of psychology and personality theory that includes major philosophical and scientific influences such as Darwin, Wundt, Freud, Jung, Rogers, James, Skinner, and systems of psychology such as structuralism, functionalism, and behaviorism. The course traces philosophical concepts such as rationalism, empiricism, mechanism, dualism, and determinism. Students are required to complete an APA style review paper and take the psychology major field test.

Distribution: EL

Formerly History of Psychology and Personality Theory

### **PSY 421 - Modern Theories of Psychology (3 cr.)**

Prerequisite: PSY 313 and junior Psychology standing or permission of the chair.

This is an examination of the development of modern behaviorism and cognitive psychology as the two dominant paradigms in modern psychology. Topics include scientific methodology, the role of scientific explanation in psychology, the study of verbal behavior and creativity, and applications of these paradigms to the development of educational, social, and cultural systems.

### **PSY 440 - Undergraduate Research (1-4 cr.)**

Prerequisite: PSY 309, senior standing, or permission of the chair of Psychology.

See "Undergraduate Research".

### **PSY 441 - Undergraduate Research (1-4 cr.)**

Prerequisite: PSY 309, senior standing, or permission of the chair of Psychology.

See "Undergraduate Research".

### **PSY 450 - Senior Psychology Research Project (4 cr.)**

Prerequisite: PSY 309 and permission of chair.

In the first semester of this course the student will prepare and present a research proposal to the Psychology faculty and students,

collect data, and work on the Introduction and Methods section of their research paper. In the second semester the student will complete the data collection, present the results to the Psychology faculty and students, and complete the research paper in APA format. The student will also assist in preparing the data for publication if applicable.

**PSY 451 - Senior Psychology Research Project (4 cr.)**

Prerequisite: PSY 309 and permission of chair.

In the first semester of this course the student will prepare and present a research proposal to the Psychology faculty and students, collect data, and work on the Introduction and Methods section of their research paper. In the second semester the student will complete the data collection, present the results to the Psychology faculty and students, and complete the research paper in APA format. The student will also assist in preparing the data for publication if applicable.

**PSY 480 - Internship in Psychology (1-3 cr.)**

See "Internships".

**PSY 481 - Internship in Psychology (1-3 cr.)**

See "Internships".

**QR - QUANTITATIVE REASONING**

**QR 112 - Quantitative Reasoning for Business (3 cr.)**

This course is designed to introduce students to the general principles of statistics and probability with a concentration on real world business applications. Topics include data collection methods, graphical and numerical methods for summarizing data, probability theory, random variables, discrete and continuous distributions including the normal distribution, and sampling distributions.

Spreadsheet software such as Excel is used throughout the course.

Distribution: BUSR/CR/GUR/MR

Offered: fall and spring semesters.

Excel software will be used in the course.

Credit for this course and MATH 120 or MATH 121 is not allowed.

**REL - RELIGIOUS STUDIES**

**REL 101 - Spirituality and Religion (3 cr.)**

This course begins with the question, What is religion? Is it a set of (theological) beliefs? A group of (spiritual) practices and rituals? A way of life? Does religion necessarily involve belief in God or gods?

The course then goes on to compare a variety of religious traditions and to address such issues as how religion influences culture and how culture influences religion, the concepts of the divine and religious experience, the nature of spirituality, the origins of religion, and religion's psychological, sociological, political, and ethical functions. The course will not proselytize for religion or privilege one religious tradition over another.

The focus may vary by instructor.

Distribution: MR

Offered: every semester.

Formerly "Introduction to Religious Studies"

**REL 120 - East Asian Traditions (3 cr.)**

Cross-Listed as: PH 120

This course will introduce the student to the philosophical and religious worldviews found in the traditions of China, India and Japan.

We will carefully read selections from some classic and contemporary texts from these traditions, as well as secondary discussions of their key ideas. We will mainly focus on Confucian, Daoist, Indian (Vedic-Hindu and Buddhism) and Japanese Shinto and Samurai worldviews.

We will ask how these perspectives and worldviews address fundamental questions such as: the nature of reality and human nature, the self, knowledge, how to live well, and the good society.

The ideas found in these Eastern (or Asian) traditions have an enduring relevance, and offer us ways to order and value human experience very different from our contemporary social life.

Distribution: MR

Offered: every semester.

Formerly "Introduction to Asian Thought"

**REL 220 - Western Religions (3 cr.)**

Prerequisite: Sophomore standing.

Cross-Listed as: PH 320

This is an examination of the beliefs, rituals, and histories of the major religions of Europe, the United States, and the Middle East. Beginning with an overview of religion in the ancient Near East, Greece, and Rome, the course concentrates on the development of Judaism, Christianity, and Islam.

Distribution: MR

Offered: every fall.

**REL 221 - Eastern Religions (3 cr.)**

Prerequisite: Sophomore standing.

This is an examination of the beliefs, rituals, and histories of the major religions of Asia. Particular attention is given to the development of Hinduism, Buddhism, Confucianism, and Taoism.

Distribution: MR

Offered: every spring.

**REL 240 - Gandhi and King (3 cr.)**

Prerequisite: Sophomore standing.

Cross-Listed as: PH 240

A critical examination of the life, times, and thought of Gandhi and King. Special attention will be paid to Gandhi's campaigns to end apartheid in South Africa and the British occupation of India, as well as King's part in the U. S. civil rights movement. The course will focus on their ethical, political, and religious thought, and their commitment to nonviolence.

This course will satisfy the ethical perspectives requirement of the GUR.

Offered: every other year.

### **REL 304 - Philosophy of Religion (3 cr.)**

Prerequisite: Sophomore standing.

Cross-Listed as: PH 304

This course consists of analysis, interpretation, and evaluation of religious responses to the world of human experience. Topics include the concern of religion with reason, order and pattern, moral insight, and art, and the context of the problems for which religion proposes solutions. Some attention is given to the history of the subject.

Offered: every year.

## **SL - SIGN LANGUAGE**

### **SL 101 - Basic Sign Language, Level I (3 cr.)**

This course is an introduction to American Sign Language, introducing nonsigners to the handshape, palm orientation, location, and movement of common signs, as well as the linguistic principles of ASL.

Offered: every fall semester.

Formerly COMM 101.

### **SL 203 - Intermediate Sign Language, Level II (3 cr.)**

Prerequisite: SL 101.

This course focuses on developing fluency in contemporary ASL.

Offered: every spring semester.

Formerly COMM 203.

### **SL 290 - Special Topics in Sign Language (1-3 cr.)**

Topics that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **SL 333-334 - Independent Study in Sign Language (1-3 cr.)**

See "Independent Study".

### **SL 390 - Special Topics in Sign Language (1-3 cr.)**

Topics that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

## **SO - SOCIOLOGY**

### **SO 101 - Introduction to Sociology (3 cr.)**

This course is an overview of the three major sociological perspectives, social science research methods, and the processes of socialization. Study of social groups, organizations, and institutions of the family, education, and economy is included. Other topics include social stratification based on class, gender, race and ethnicity, deviance, and social change.

Distribution: A&SR/BUSR/GUR/MR

This course is a prerequisite.

### **SO 190 - Special Topics in Sociology (1-3 cr.)**

Topics in sociology that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **SO 201 - Social Problems (3 cr.)**

Prerequisite: SO 101.

This course is a continuation of SO 101 and covers such issues as perspectives on social problems as well as social problems such as economic inequality, family problems, crime, and environmental problems from a critical constructionist perspective.

Distribution: MR

### **SO 208 - Gender (3 cr.)**

Prerequisite: SO 101

Focusing on a balanced view between theories and "real world" applications, this course introduces students to the role that gender plays on the shaping of social institutions (including religion and education), families, groups, plus how gender intersects the variables of race, class and sexuality. Particular attention will be given to the history of gender roles, as well as how the social and biological constructs of gender impact contemporary relationships, the work environment, and crime.

### **SO 210 - Criminology (3 cr.)**

Prerequisite: CJ 101, SO 101, ENGL 132 and ENGL 133

Cross-Listed as: CJ 210

This is an examination of the various categories of offenses and offenders including casual and habitual individual offenders, organized criminal enterprises, and white-collar criminals. Current theories and research, with an emphasis on understanding the causative factors and sociological implications of criminal and delinquent behavior, are included.

Offered: fall and spring semester

Satisfies one of the Writing Intensive course (WIC) requirements for Arts and Sciences students.

### **SO 211 - Race and Ethnicity (3 cr.)**

Prerequisite: SO 101

This course is designed to familiarize students with the basic concepts of Sociology as they apply to the study of race and ethnicity. The relationships among and between various racial and ethnic groups in the United States will be approached from a socio-historical perspective. Particular attention will be given to concepts such as dominant-minority group relations, racism, discrimination, colorism, privilege, oppression, immigration, assimilation, white supremacist capitalist patriarchy, and the social construction of race.

### **SO 214 - Drugs, Society, and The Criminal Justice System (3 cr.)**

Cross-Listed as: CJ 214

This is a study of the legal and social background of the pressing problem of drugs and alcohol and their use and abuse in American society.

Offered: fall and spring semester

### **SO 231 - Music (Sub)Cultures in the US & UK (3 cr.)**

Cross-Listed as: CUL 231

This course examines the historical emergence, socio-political worldviews, and material output of various musical subcultures in the United States and the United Kingdom. An integral aspect of all subcultures is the concept of resistance: the styles of these subcultures can be understood as representing a symbolic challenge to the prevailing social/cultural order. Course participants will be introduced to the Sociological analysis of culture (and subculture) by comparing a series of examples in the US and the UK: punk, hip-hop, heavy metal, reggae, jazz, and folk. These cases further allow us to explore the relationship between race, socio-economic class, and global politics in both countries.

Satisfies Elements of Culture requirement "CA."

### **SO 290 - Special Topics in Sociology (1-3 cr.)**

Topics in sociology that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **SO 300 - Applied Analytic Methods (3 cr.)**

Prerequisite: CJ 101 or SO 101, MATH 120

Designed to offer preparation for SO/CJ 301 (Research Methods), this course is intended to provide students with a foundation in quantitative research literacy. In an ever increasingly data driven economy and society, students are introduced to univariate, bivariate, and basic multi-variate statistical analysis by way of theory and application. Students will learn state-of-the-art computer software commonly used in quantitative research in criminal justice, criminology, and sociology.

Offered: Fall semester

### **SO 301 - Quantitative Research Methods (4 cr.)**

Prerequisite: SO 101

This course is an introduction to scientific research in the social sciences. Its primary goals are to provide students with a foundation necessary for conducting quality research and to provide students with skills necessary to analyze and interpret research data. The course highlights the logic of research designs, the relation between experimental and nonexperimental research strategies, and the application of quantitative methods. It provides experience in collecting and analyzing research data, writing, and preparing research reports. This course will discuss and contextualize the concepts and techniques of quantification in social science research, which include descriptive, univariate, parametric, nonparametric, and inferential analyses. Students will learn to use a statistical computer-software package to perform analyses on research data.

Offered: Spring semester

Formerly Research Methods

### **SO 305 - The Sociology of Urban Life (3 cr.)**

Prerequisite: SO 101

This is an examination of the influence of the city upon social relations, institutional life, and personality development. Attention is given to both American and non-American areas. The greater Springfield area is used as a laboratory for research.

### **SO 307 - Qualitative Research Methods (4 cr.)**

Prerequisite: SO 101

This course is designed to introduce students to the principles of research methodology—the techniques used for collecting empirical

data. We will focus in particular on the qualitative methods used by Sociologists to study social life: descriptive and interpretive methods of inquiry. In addition to an overview of various qualitative methods (interview, textual analysis, participant observation etc.), this course will emphasize methodological thinking. This includes the philosophical and conceptual underpinnings of qualitative Sociology, as well as a consideration of the link between theory and method.

Changed from 3 crs to 4 crs Fall'16.

### **SO 308 - Sociology of the Family (3 cr.)**

Prerequisite: SO 101

This is a review of the historical development of the family as the most fundamental institution in society and the source of primary socialization. Topics include traditional and contemporary functions, problems of single-parent families, two-career families, alternative family structures, and current family policies.

### **SO 309 - Deviance (3 cr.)**

Prerequisite: SO 101

Cross-Listed as: CJ 309

This is an analysis of social norm violations and group responses to deviant behavior. Emphasis is on the nature of social norms and rules; styles of social control; sources and varieties of deviant behavior; the development of unconventional ideologies and world views; and the role of deviant subcultures, associations, and organizations.

Distribution: MR

### **SO 315 - Organizational Theory (3 cr.)**

Prerequisite: MAN 101/HONB 101 or MAN 204/HONB 204 or SO 101.

Cross-Listed as: MAN 315

This course examines organization theory and design in order to develop skills for analyzing complicated situations in contemporary organizations. Among the important topics covered are: the history of organization theory, the character of technology, social structure, and environment with respect to organizations, the nature of power and culture, and the strengths and weaknesses of various organizational designs.

### **SO 321 - Classical Theory (3 cr.)**

Prerequisite: SO 101

The theory course is a cornerstone of almost any undergraduate program in sociology. Generally, theory can be used to filter out interpretations of the events we see unfolding around us on a day-to-day basis. This course offers grounding in classical sociological theory, and then focuses on more recent developments in theory, such as structural functionalism, symbolic interactionism, dramaturgical theory, structuration theory, and postmodern theory.

Distribution: MR

### **SO 322 - Contemporary Theory (3 cr.)**

Prerequisite: SO 101

This course is designed to familiarize students with contemporary theoretical traditions in Sociology. Building on the foundational work of the classical theorists –Marx, Weber, Durkheim, Simmel, and Du Bois – we will explore how Sociological theory grapples with late modernity. As Western societies moved toward an increasingly urban post-industrial social landscape, questions about identity, community, and the structure of society became the concerns of a new generation of theorists. A survey of the major perspectives in contemporary sociological theory will include relatively established fields like structural functionalism, critical theory, symbolic interaction along with more recent developments such as intersectional feminism, postmodernism, and queer theory.

Distribution: MR

Formerly "Social Theory"

### **SO 326 - Sociology of Culture (3 cr.)**

Prerequisite: SO 101

This course offers a broad interdisciplinary overview of the quickly emerging field of culture studies within sociology. This course uses key sociological paradigms and anthropological theories to explore the production and consumption of culture, taking a multi-cultural view. Students are introduced to how culture is shaped by religion, politics, economics, modernity, and technology, as well by social class and stratification. Within this course, students will also explore the methods by which culture is studied within sociology and will apply these methods to the examination of ancient/classical or contemporary culture in the United States and abroad.

### **SO 333 - Independent Study in Sociology (1-3 cr.)**

See "Independent Study".

### **SO 334 - Independent Study in Sociology (1-3 cr.)**

See "Independent Study".

### **SO 341 - The Sociology of Work (3 cr.)**

Prerequisite: SO 101

This course explores the world of work from a practical perspective. Students will prepare themselves for careers of their choosing. They will learn how to research careers in depth, prepare effective résumés and cover letters, and use sociological methods to develop viable careers for themselves. In addition, the course explores substantive sociological issues in the world of work and helps students develop their skills of analysis, reasoning, and understanding of a fast changing environment.

### **SO 342 - Juvenile Delinquency (3 cr.)**

Cross-Listed as: CJ 342

This course focuses on the history, causes, behavior, laws, and treatment of juveniles. It includes the criminal justice system, the process within the system, court decisions, and alternatives to incarceration. Where possible, on-site locations are visited. An in-depth perspective of juvenile gangs, drugs, and crime is included.

Offered: Fall semester

### **SO 343 - Domestic Violence (3 cr.)**

Cross-Listed as: CJ 343

Domestic violence between adults is studied from an interdisciplinary perspective. The cycle of violence, dominance, and control are

among the issues to be covered sociologically and psychologically. The legal perspective includes discussion of proactive arrest policies, restraining orders, and anti-stalking legislation that have emerged across the United States.

Formerly SO 235

### **SO 390 - Special Topics in Sociology (1-3 cr.)**

Topics in sociology that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **SO 410 - Social Change (3 cr.)**

Prerequisite: SO 101

This is a study of the major social and cultural changes occurring in contemporary societies with major emphasis on the United States. Topics include social trends, planned social change and social invention, technological development as a cause of unplanned social change, the transformation of the workplace in industrial and information societies, and social movements.

Offered: alternate years in the spring semesters.

### **SO 413 - Social Inequality (3 cr.)**

Prerequisite: SO 101

This is a consideration of the causes of institutionalized inequality in social life. Topics include theories of social class and the distribution of social powers and privileges. Special attention is given to caste and class in America and their relationship to the development of civil rights.

Offered: alternate years in the fall semesters.

Formerly "Social Inequality and Justice"

### **SO 480 - Internship in Sociology (1-3 cr.)**

See "Internships".

### **SO 481 - Internship in Sociology (1-3 cr.)**

See "Internships".

## **SPAN - SPANISH**

### **SPAN 101 - Elementary Spanish I (3 cr.)**

Prerequisite: Since this course is an introduction to the language, it is not recommended for students with more than 3 years of high school Spanish.

This is an introduction to the language including basic pronunciation, simple conversation structure, and structural analysis of sentences. Class activities will focus on speaking, listening, and reading in Spanish.

Offered: every fall.

### **SPAN 102 - Elementary Spanish II (3 cr.)**



Prerequisite: SPAN 101 or the equivalent. Since the course is considered an introduction to the language, it is not recommended for students with more than 3 years of high school Spanish.

This is a continuation of SPAN 101 at a level of increasing complexity and with some attention to writing the language.

Offered: every spring.

### **SPAN 130 - Spanish for Criminal Justice (3 cr.)**

Prerequisite: Not open to students who have completed SPAN 102 or a 200 or 300-level SPAN course or with two or more years of high school Spanish.

This is an introduction to the specialized vocabulary and basic grammatical structures needed by people working in the field of law enforcement. The course provides students with the opportunity to use their linguistic foundation to develop conversational facility in Spanish. Their conversational skills are developed through creating dialogues and presenting original skits centering on probable law enforcement situations.

Offered: once a year.

### **SPAN 140 - Spanish for Social Services (3 cr.)**

Prerequisite: Not open to students who have completed SPAN 102 or a 200 or 300-level SPAN course or with two or more years of high school Spanish.

The course introduces students to the specialized vocabulary and basic grammatical structures needed by people working in the field of social services. It gives students the opportunity to use their linguistic foundation to develop conversational ability in Spanish. Each lesson in the supplementary text focuses on a situation commonly encountered by social service professionals. Conversational skills are developed through realistic dialogues and original skits and conversations, which introduce the words and expressions that social service professionals need in their daily work.

Distribution: MR

Offered: once a year.

### **SPAN 190 - Special Topics in Spanish (1-3 cr.)**

Topics in Spanish that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies

### **SPAN 203 - Intermediate Spanish I (3 cr.)**

Prerequisite: SPAN 102 or the equivalent.

This is a review of Spanish grammar and sentence structure with study and practice in the more complex structures of the language. Class time and activities will focus on building language skills and cultural knowledge through conversation, reading, speaking and composition.

Offered: every fall.

### **SPAN 204 - Intermediate Spanish II (3 cr.)**

Prerequisite: SPAN 203 or the equivalent.

This is a continuation of SPAN 203.

Emphasis is on advancing cultural awareness and conversational skills. Classroom activities will also center on developing the student's oral, writing, and reading skills.

Offered: every spring.

### **SPAN 290 - Special Topics in Spanish (1-3 cr.)**

Topics in Spanish that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies

### **SPAN 305 - Advanced Conversational Spanish I (3 cr.)**

Prerequisite: SPAN 204 or the equivalent.

This course studies oral aspects of the language: colloquialisms, pronunciation, vocabulary building, and practical use of advanced Spanish. Class discussions; conversations, and presentations are used to develop cultural awareness and fluency in the spoken language.

Offered: every fall.

### **SPAN 306 - Advanced Conversational Spanish II (3 cr.)**

Prerequisite: SPAN 305 or permission of the instructor.

This is a continuation of SPAN 305 with emphasis on Hispanic culture in contemporary Latin America through a combination of conversation and writing activities.

Offered: every other spring.

### **SPAN 325 - Goya to Almodovar: Hispanic Culture (3 cr.)**

Prerequisite: SPAN 204 or equivalent, or permission of the instructor.

This course will provide students with an overview of important intellectual and literary currents in the Spanish-Speaking world from the Enlightenment to the contemporary period. Throughout the course, students will analyze canonical texts in literature, art, poetry, and film in order to better understand the major debates and events that shaped Hispanic culture and society.

This course is meant for advanced students and will be taught entirely in Spanish.

Offered: every other spring.

### **SPAN 333 - Independent Study in Spanish (1-3 cr.)**

See "Independent Study".

### **SPAN 334 - Independent Study in Spanish (1-3 cr.)**

See "Independent Study".

### **SPAN 390 - Special Topics in Spanish (1-3 cr.)**

Topics in Spanish that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **SPAN 480 - Internship in Spanish (1-3 cr.)**

See "Internships".

## **SPMN - SPORT MANAGEMENT**

### **SPMN 250 - Managing Sport Organizations (3 cr.)**

The course provides an introduction to the field of sport management through an application of significant management principles to sport organizations and the role of the manager in ensuring organizational performance. Key learning outcomes focus on the understanding and recognition of the: history and development of sport management as a profession and discipline; management, legal, financial, and marketing principles; vocabulary and themes of the sport industry; concepts, issues, and management practices unique to sport industries; research skills including data collection and analysis; and sport career exploration and investigation.

Distribution: MR

Offered: in Fall and Spring

### **SPMN 333 - Independent Study in Sport Management (3 cr.)**

See "Independent Study".

### **SPMN 334 - Independent Study in Sport Management (3 cr.)**

See "Independent Study".

### **SPMN 341 - Sport Agency & the Professional Athlete (3 cr.)**

Prerequisite: SPMN 250

This course examines the role, responsibilities and function of the sport agent in the professional sport. Topics include the history of sport agency, regulations, registration and certification, client recruitment and evaluation, contract negotiations, agent-athlete relationship, personal services including financial management, post-career counseling and community/social responsibility initiatives. The course will also explore the role of the sport agent as it relates to the league, governing bodies, players' union and the individual athlete. Ethical dimensions of sport agency as well as professional agent sport career development strategies will be considered.

Distribution: MR

### **SPMN 342 - Scouting & Player Personnel Development (3 cr.)**

Prerequisite: SPMN 250

This course is designed to provide students with an introduction to the techniques relating to player evaluation and assessment in amateur and professional sport. The course will focus specifically on the function of scouting and recruitment of amateur and professional athletes and will provide students hands-on experience in player personnel development with specific focus on the baseball industry segment. Students will explore important historical and contemporary economic development issues related to player development as well as contemporary issues relating to organizational design, management, and the development and integration of quantitative analysis methods. Course content will consist of lectures, readings, extensive class and group discussion, video, guest lecturers, and extensive player analysis fieldwork.

Distribution: MR

### **SPMN 355 - Sport Facility Planning and Management (3 cr.)**

Prerequisite: SPMN 250.

The course provides an overview of sport facility planning and management. Key learning outcomes focus on understanding managerial issues related to various sport facilities including stadiums and arenas, sport facility planning, design, and construction; sport facility finance; project feasibility; economic impact of sport facilities and events; outsourcing of operational services; application of management principles including budgeting, promotion, public relations, security and risk management, event planning, and game operations.

Distribution: MR

Offered: in Fall and Spring

### **SPMN 366 - Sport Marketing (3 cr.)**

Prerequisite: MK 200/HONB 200 and SPMN 250.

This course compares and applies concepts of mainstream marketing to the sport industries and examines the marketing of sport products and the marketing of mainstream products through sport. Key learning outcomes include the understanding and use of the historical foundations of sport marketing; the application of marketing principles to the specific organizational environments of collegiate and professional sport, special events, sporting goods, and licensed product manufacturing; and facility management.

Distribution: MR

Offered: in Fall and Spring

### **SPMN 380 - Golf Industry and Golf Management (3 cr.)**

Prerequisite: Junior standing

This course is designed to introduce students to the business of the golf industry. Student will explore all aspects of golf operations including management of tournaments, leagues, food service, pro shop, membership programs and the golf course itself. Golf industry specific business applications including marketing strategies, revenue development, customer service, organizational structure and governance, human resource management and environmental impact and sustainability will be examined. Current issues in golf management including trend analysis and technological applications will be discussed. Students will also learn about employment requirements and opportunities in the golf business.

Distribution: MR

### **SPMN 390 - Special Topics in Sport Management (3 cr.)**

This course is a study of advanced topics in sport management, but not carried in the catalogue on a regular basis.

### **SPMN 420 - International Sport Management (3 cr.)**

Prerequisite: SPMN 250

This course provides students with an in depth look at the diverse and expanding professional practice of sport management in an international context. Students will explore international sport from historical, cultural, political, and business perspectives. Emphasis is given to an examination of the Olympic movement as well as to the globalization of professional sport. Current issues related to the management of international sport organizations are examined. Opportunities for employment in international sport organizations are also identified.

Offered: in Fall and Spring

### **SPMN 450 - Managing Collegiate/Scholastic Athletic Programs (3 cr.)**

Prerequisite: SPMN 250 or permission of instructor.

This course provides the student with an opportunity to combine classroom instruction with hands-on experience in sport management through a practicum in the University's Athletic Department. The course is designed to allow the student to apply theoretical knowledge to the practice of sport management through a variety of activities and assignments that may include game operations, facility management, compliance, fund raising, shadowing of athletic administrator, budgeting, event coordination, sport marketing, and media relations. Key learning outcomes focus on effective performance as a member of a sport management team, application of quality management principles to college/university/scholastic sport programs and services, development of professional skills, understanding of practice of sport management, and refinement of career direction.

### **SPMN 460 - Advanced Field Experience in Sport Management (3 cr. each.)**

Prerequisite: 3.0 overall GPA, instructor permission, and two faculty endorsements.

The goal of this course is to provide students with the opportunity to gain extensive hands-on experience in a sport organization. Students are placed in a sport business environment and their work experience is communicated to a faculty sponsor via faculty-student meetings, on-site visits, written assignments, oral presentations, final project, and formal AFE defense. Only students who have demonstrated academic excellence; a high degree of commitment to a career in the sport industry; and the necessary motivation, leadership and managerial skills to undertake the AFE course are eligible for enrollment. The AFE is a six-credit course designed to primarily be taken in the senior year. Concurrent enrollment in SPMN 460 and SPMN 461 is required.

### **SPMN 461 - Advanced Field Experience in Sport Management (3 cr. each.)**

Prerequisite: 3.0 overall GPA, instructor permission, and two faculty endorsements.

The goal of this course is to provide students with the opportunity to gain extensive hands-on experience in a sport organization. Students are placed in a sport business environment and their work experience is communicated to a faculty sponsor via faculty-student meetings, on-site visits, written assignments, oral presentations, final project, and formal AFE defense. Only students who have demonstrated academic excellence; a high degree of commitment to a career in the sport industry; and the necessary motivation, leadership and managerial skills to undertake the AFE course are eligible for enrollment. The AFE is a six-credit course designed to primarily be taken in the senior year. Concurrent enrollment in SPMN 460 and SPMN 461 is required.

### **SPMN 465 - Seminar in Sport Management (3 cr.)**

Prerequisite: Senior Sport Management majors

The course examines contemporary issues in sport management. Key learning outcomes focus on understanding and problem-solving applications associated with revenue development models across a variety of sport business life-cycle events; environmental forces shaping policy-making within sport organizations; ownership models and issues; sport leadership; maximization of sport organization revenue streams budget analysis human resource development practices in sport organizations including CORI/SORI checks, salary caps, player development, and volunteer training. Strategies for sport industry career determination and implementation are emphasized.

Distribution: MR

Offered: in Fall and Spring

### **SPMN 480 - Internship in Sport Management (3 cr.)**

See "Internships".

credit change Fall'22 to 3 crs.

### **SPMN 481 - Internship in Sport Management (1-3 cr.)**

See "Internships".

## **SW - SOCIAL WORK**

### **SW 100 - Introduction to Social Work (3 cr.)**

This is an introduction to the development of the social work profession including its body of knowledge, values, ethics, and skills. Students learn about core practice concepts such as person-in-environment, generalist practice, and systems theory, and they explore the settings where social work practice takes place, problems and issues requiring social work intervention, and social work practice at particular stages of human growth and development. The course addresses the impact of race, class, ethnicity, gender, sexual preference, abilities, and culture on human functioning. An emphasis is placed on helping students assess their motivation to pursue a career in social work.

Distribution: GUR/MR

This course is a prerequisite.

### **SW 190 - Special Topics in Social Work (1-3 cr.)**

Topics in social work that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **SW 203 - Child Welfare: Strengthening Children, Families and Society (3 cr.)**

This course will focus on societal practices and policies that positively affect child development and strengthen family stability in overcoming obstacles and barriers. The emphasis will be on traditional areas of concern such as poverty, child maltreatment, substitute family care within the context of other global issues such as child labor, child trafficking, armed conflict child soldiers, lack of education, and family/community violence. Children and families are the foundation and future of all societies. Hence, it is important and vital to gain knowledge and understanding that will enable us to be effective social work advocates.

Formerly "Child Welfare: Saving Children and Strengthening Families - A Multicultural Global Approach"

### **SW 204 - Social Work and Criminal Justice (3 cr.)**

This course examines the role of social workers in criminal justice settings, such as probation offices, prisons, the courts, and other aspects of the legal system. Social work values and ethics and their integration with criminal justice "host settings" will be discussed. Specific problems addressed by social work within the criminal justice system, such as juvenile delinquency, gangs, domestic violence, and other violent crimes will be reviewed.

### **SW 207 - An Invitation to the World of Aging (2 cr.)**

Prerequisite: Soph SW major, or Soph SW minor, or SW 100.

This course will provide students with knowledge about older people and the field of gerontological social work. The course will enable students to explore aging through learning beyond the classroom experiences, as well as classroom presentations and discussion. Students will be challenged to reexamine their values and beliefs about aging and older people. The course will help to prepare BSW students to work in settings that serve elderly clients.

**SW 216 - Human Behavior in the Social Environment (3 cr.)**

Prerequisite: SW 100, SO 101, PSY 101, or CJ 101

This course is a social systems approach to relations among individuals, families, groups, communities, and organizations. Emphases on at-risk populations and diversity throughout the life cycle; the impact of the social environment on behavior; including the relationship of social policy to human behavior and development.

Distribution: MR

**SW 290 - Special Topics in Social Work (1-3 cr.)**

Topics in social work that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

**SW 300 - Social Work Pre-Practicum Seminar (1 cr.)**

This course provides students with the knowledge, values and skills necessary to succeed in junior year field practica and in senior field instruction. In addition to fostering students' capacity for self-reflection and self-correction related to their professional behavior, the seminar will help students develop strategies to function as social work interns in social service agencies and community organizations. Students will examine a range of professional concerns in social work, including safety, self-care, and attention to community and political contexts.

**SW 301 - Generalist Social Work Practice I (3 cr.)**

Prerequisite: SW 100, SW 216, and junior standing.

Corequisite: SW 306

The first of a 2-semester sequence, this course provides students with a theoretical and ethical framework that supports their development of generalist social work practice skills. The course introduces students to all phases of the social work intervention process. Students will learn skills and strategies to engage clients, assess clients' needs and resources, and develop measurable goals and objectives with clients. Special emphasis is placed on social work practice with individuals.

Students are required to also enroll in SW 306, a 40-hour field practicum in which they apply their developing social work practice skills in an agency setting.

Distribution: MR

Fall'14 - 4 to 3 crs

Formerly "Social Work Interventive Methods I"

**SW 302 - Generalist Social Work Practice II (3 cr.)**

Prerequisite: SW 301 and junior standing.

Corequisite: SW 305.

Expanding on knowledge and skills developed in SW 301, this course supports students' continued development of foundational skills in all phases of the social work intervention process. Students will learn to implement action plans with clients, evaluate client progress and outcomes, and navigate the termination process. Special emphasis is placed on the intentional use of specific interviewing and practice skills, cultural sensitivity and responsiveness, and self-awareness in social work practice, as well as special practice challenges such as engagement of mandated clients.

Students are required to also enroll in SW 305, a 45-hour field practicum in which students apply social work practice skills in an agency setting.

Distribution: MR

Formerly "Social Work Interventive Methods II"

**SW 303 - Generalist Social Work Practice III (3 cr.)**

Prerequisite: SW 301 and junior standing.

Students learn the knowledge, values, and skills of macro level social work practice with communities and organizations. The course applies the social work problem-solving process and social work values and ethics to organizational, community, political, and social problems. Theories of community practice that address problem identification and intervention strategies on a continuum ranging from the local level to large-scale social change are covered. The course examines the role of the social service organization in the community and the impact of the community and organizational systems on human functioning. The relationship between micro and macro level practice, the social worker's ethical responsibility for promoting social justice, and macro level approaches for advocating for social justice are covered.

Distribution: MR

Formerly "Social Work Interventive Methods III"

**SW 305 - Helping Relationship Practicum II (2 cr.)**

Prerequisite: SW 301.

Corequisite: SW 302.

The second semester of a year-long field practicum, this course includes 45 hours of field-based learning in a social service organization and an accompanying weekly integrative seminar. Students continue to apply knowledge and skills developed in SW 301 & SW 302, while assuming professional helping roles with clients. Students engage in peer support and problem-solving and formally present practice challenges in class.

Distribution: MR

Formerly "The Helping Relationship Project"

**SW 306 - Helping Relationship Practicum I (1 cr.)**

Prerequisite: SW 100, SW 216 and Junior Standing.

Corequisite: SW 301

The first semester of a year-long field practicum, this course includes 40 hours of field-based learning in a social service organization and an accompanying weekly integrative seminar. Students are introduced to professional social work in an agency context, applying knowledge and skills developed in SW 301 to their interactions with

clients.

Distribution: MR

Formerly "The Helping Relationship Practicum"

### **SW 310 - SUBSTANCE USE AND THE FAMILY (3 cr.)**

Prerequisite: Some background in sociology, psychology, or social work is preferred, but not a prerequisite.

Students survey the field of substance abuse prevention, diagnosis, treatment, and policy. The course discusses the myths surrounding substance abuse, identifies who is at most risk, and looks at the progression from substance use to substance addiction. Students learn about the effects of substance abuse in the family and discuss differential interventions and treatment. The course looks at substance abuse policy in the United States, including the effects of the mass media on use.

Formerly Substance Abuse and the Family

### **SW 313 - Social Welfare and Social Policy (3 cr.)**

Prerequisite: SW 100, POSC 102, and junior standing.

This is an examination of the structure and policies of social institutions as they relate to social welfare and the profession of social work. Students are introduced to the history, philosophy, and development of social welfare including a close review of American social welfare institutions. The history and ideology of contemporary social welfare programs are reviewed to provide students with a framework for policy analysis and to foster skill in identifying the impact of social policies on human functioning.

Distribution: MR

### **SW 314 - Practicum in Social Justice and Macro-level Change (3 cr.)**

Corequisite: SW 100, PSY 101, SO 101, CJ 101 or LSOC 102

This course includes a hands-on practicum (120 hours) and an accompanying weekly integrative seminar in which students reflect on their hands-on learning. Students are assigned to community-based sites such as non-profit and community organizations, coalitions, social service programs, or legislators' offices. Through engagement in projects and activities such as community outreach, coalition-building, or social action within their practicum sites, students apply social justice and social work macro-practice principles in real-world settings, developing skills to work toward change at the organization, community, and/or policy level.

Distribution: MR

Formerly "Field Instruction in Macro Practice"

Formerly "Macro Practice Field Practicum"

### **SW 320 - Dynamics of Oppression and Empowerment (3 cr.)**

Prerequisite: SW 100, PSY 101, SO 101, CJ 101 or LSOC 102

This course is an introduction to understanding issues of diversity and social justice in the United States. The course will provide students with a theoretical framework for understanding the dynamics of oppression and allow students to expand their knowledge of specific forms of oppression. In addition the course will help students develop

a perspective for culturally sensitive and multi-cultural social work practice, through self-examination of their own multiple identities. Students will also develop an appreciation of the impact of race, ethnicity, class, age, religion, physical and mental abilities, and sexual orientation on the client worker relationship.

Distribution: MR

### **SW 321 - Empowerment Practice with Underserved Populations (3 cr.)**

Prerequisite: SW 100 and SW 320

This is an examination of the impact of oppression on human functioning focusing on teaching students specific practice approaches for empowerment practice with oppressed groups. The course helps students to develop culturally sensitive social work practice skills and an appreciation of the impact of power and difference on the client-worker relationships. Students examine the social worker's ethical role as an advocate for social justice. Specific approaches for helping clients gain access to opportunities for growth are taught from micro and macro perspectives. The course helps students continue to develop culturally sensitive social work practice skills and an appreciation of the impact of power and difference on the client-worker relationship.

### **SW 333 - Independent Study in Social Work (1-3 cr.)**

See "Independent Study".

### **SW 334 - Independent Study in Social Work (1-3 cr.)**

See "Independent Study".

### **SW 390 - Special Topics in Social Work (1-3 cr.)**

Topics in social work that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **SW 404 - Generalist Social Work Practice IV (3 cr.)**

Prerequisite: SW 301, SW 302, SW 303, and senior Social Work standing.

This course focuses on social work practice with diverse families and small groups. Students learn family systems theory and its application to the problem-solving process in social work practice. Roles of family practitioners at the BSW level are discussed with an emphasis on family preservation and family skill building programs that provide services to multiproblem families. Students learn social group work theory including types of social work groups, steps in creating a social work group, stages of group development, group dynamics, the roles of the group facilitator and group members, and the benefits of social group work. Diversity issues in social group work are discussed as well as values and ethics specific to social work with groups. Students learn about the use of groups as a modality for client empowerment.

Distribution: MR

Formerly "Social Work Interventive Methods IV"

### **SW 409 - Senior Field Instruction I (3 cr.)**

Prerequisite: SW 302, SW 303, and senior Social Work standing.

Corequisite: concurrent registration in SW 414.

The 4-course sequence (SW 409-SW 412) is an introduction to the practice of social work in a social service organization. Students are required to complete 225 hours/semester in their placement

organizations, engaging in a range of assigned duties. Closely supervised by an experienced professional social worker, students must also complete a comprehensive set of learning activities that encompass a broad range of generalist practice concepts and skills. Through completion of these activities, students develop the practice skills and competencies deemed essential to entry-level generalist social work by the Council on Social Work Education.

Distribution: MR

These courses are graded on a pass/fail basis.

Formerly "Field Instruction in Social Work I"

### **SW 410 - Senior Field Instruction II (3 cr.)**

Prerequisite: SW 302, SW 303, and senior Social Work standing.

Corequisite: concurrent registration in SW 414.

The 4-course sequence (SW 409-SW 412) is an introduction to the practice of social work in a social service organization. Students are required to complete 225 hours/semester in their placement organizations, engaging in a range of assigned duties. Closely supervised by an experienced professional social worker, students must also complete a comprehensive set of learning activities that encompass a broad range of generalist practice concepts and skills. Through completion of these activities, students develop the practice skills and competencies deemed essential to entry-level generalist social work by the Council on Social Work Education.

Distribution: MR

These courses are graded on a pass/fail basis.

Formerly "Field Instruction in Social Work I"

### **SW 411 - Senior Field Instruction III (3 cr.)**

Prerequisite: SW 409, SW 410, and senior Social Work standing.

Corequisite: SW 415.

The 4-course sequence (SW 409-SW 412) is an introduction to the practice of social work in a social service organization. Students are required to complete 225 hours/semester in their placement organizations, engaging in a range of assigned duties. Closely supervised by an experienced professional social worker, students must also complete a comprehensive set of learning activities that encompass a broad range of generalist practice concepts and skills. Through completion of these activities, students develop the practice skills and competencies deemed essential to entry-level generalist social work by the Council on Social Work Education.

Distribution: MR

These courses are graded on a pass/fail basis.

Formerly "Field Instruction in Social Work II"

### **SW 412 - Senior Field Instruction IV (3 cr.)**

Prerequisite: SW 409, SW 410, and senior Social Work standing.

Corequisite: SW 415.

The 4-course sequence (SW 409-SW 412) is an introduction to the practice of social work in a social service organization. Students are

required to complete 225 hours/semester in their placement organizations, engaging in a range of assigned duties. Closely supervised by an experienced professional social worker, students must also complete a comprehensive set of learning activities that encompass a broad range of generalist practice concepts and skills. Through completion of these activities, students develop the practice skills and competencies deemed essential to entry-level generalist social work by the Council on Social Work Education.

Distribution: MR

These courses are graded on a pass/fail basis.

Formerly "Field Instruction in Social Work II"

### **SW 414 - Seminar in Field Instruction I (2 cr.)**

Prerequisite: SW 301, SW 302, SW 303, and senior Social Work standing.

Corequisite: Concurrent registration in SW 409 and SW 410.

This seminar emphasizes the integration of knowledge, values, and skills developed in the classroom with the field education experience. Through completion of written assignments and active in-class discussion and peer problem-solving, students consider their roles as social work interns within the organizational context, and explore ethical and practice challenges encountered in their field placement organizations.

Distribution: MR

Changed to 1 cr Fall'10. Changed to 2 cr Fall'13.

### **SW 415 - Seminar in Field Instruction II (1 cr.)**

Prerequisite: SW 409, SW 410, and SW 414.

Corequisite: Concurrent registration in SW 411 and SW 412.

Continuing to support students' integration of classroom and field-based learning, this seminar requires students to reflect on and critically analyze their direct practice skills. In addition to regular integrative written assignments and active class discussion and peer problem-solving, students engage in formal case presentations.

Distribution: MR

Changed to 2 cr. 5/2011. Changed to 1 cr. effective Fall'13.

### **SW 419 - Social Work Research Methods (3 cr.)**

Prerequisite: PSY 207 or MATH 120, and senior standing.

This course prepares students to become research-informed social work practitioners, capable of practicing evidenced-based social work. Focusing on the ethical conduct of research, students learn research basic design in social work, including a range of qualitative and quantitative research methods. Students conduct a comprehensive search of research literature related to their field placement setting and its clients. The resulting literature review assignment is reviewed by peers and is revised, and forms the basis of students' spring semester research projects (SW 420).

Distribution: MR

This course satisfies one of the A & S Writing Intensive course requirements for Social Work majors only.

Formerly "Social Work & Research"

### **SW 420 - Social Work Research Seminar (2 cr.)**

Prerequisite: SW 419 and senior standing.

This two-credit seminar supports students' implementation of research projects in their field placement organizations. Students develop and implement projects based on an identified need in the field placement organization. The research projects may involve program or practice evaluation, needs assessment, or descriptive studies. Students engage in quantitative and/or qualitative data collection and analysis, write reports summarizing their findings, and prepare poster presentations.

Credit change from 1 cr. to 2 cr. Fall 2015

## **THTR - THEATRE**

All THTR courses satisfy Aesthetic Perspective requirement.

### **THTR 101 - Acting I (3 cr.)**

Learn the fundamental techniques of the craft of acting through theatre exercises, presentations, and scene work from popular Broadway and Off-Broadway Plays.

Offered: every fall.

Formerly THTR 208.

### **THTR 110 - Introduction to Theatre (3 cr.)**

Students will explore theatre as a collaborative art through lecture and participation. The disciplines of acting, directing, playwriting, design, and criticism will be surveyed through the backdrop of popular American theatre. Students will attend and review play productions on and off campus, view "live" theatre on video, view films based on popular plays read in class and participate in a group generated performance project.

Previously "Theatre Appreciation"

### **THTR 151-158 - Stageless Players (1 cr.)**

Students participate in the theatre productions of the Stageless Players. May be taken more than once. (151 is fall and 152 is spring.)

Formerly COMM 151-158.

### **THTR 160-168 - Improv on the Rocks (1 cr.)**

Prerequisite: THTR 220, permission of the instructor

Students performing with Improv on the Rocks must rehearse two evenings a week, perform in a minimum of four shows throughout the semester, and if during the spring term, compete in ImprovBoston's Regional Improv Troupe Tournament. A Final Paper at the end of the semester discusses the experience of performance and how the techniques from Improv Comedy Class, and the additional readings, were used in each performance.

### **THTR 201 - Acting II (3 cr.)**

Prerequisite: THTR 101 or equivalent, or permission of instructor.

This course will explore the acting techniques of Stanislavski through monologue and scene work from the great playwrights of Realism.

Offered: every other spring.

Formerly THTR 308.

### **THTR 220 - Improvisational Comedy I (3 cr.)**

This course is an intensive introduction to the art and performance of short form improvisation. This course is designed to teach the fundamentals of short form improvisation, which include game playing, scene work, ensemble, and performance. In addition, students will learn the art of creating sketch comedy through journaling, observation, improvisation, and performance. The methods of Viola Spolin and the Players Workshop of Chicago, The Second City of Chicago, Keith Johnstone, and Theatre Sports will be used. The creation and presentation of four public improvisational comedy performances is the backbone of the course. The success of the class is dependent on the creation of an ensemble of players who are committed to the other as being the most important person on stage. The ensemble is more important than the individual in improvisation.

Offered: every year.

Formerly THTR 320.

### **THTR 221 - Improvisational Comedy II (3 cr.)**

This course is an intensive introduction to the art and performance of long form improvisation. Long form is at least 10 minutes in length and consists of a number of short scenes edited by the performers onstage... The individual parts of long form should be related in some fashion (Libera, The Second City Almanac of Improvisation). This course is designed to teach the fundamentals of improv scene work, game playing in scenes, basic rules of improv, several long form structures, group mind in an ensemble, and performance of the taught structures. The methods of I.O. (Formerly Improv Olympic), Viola Spolin, The Second City of Chicago, and Keith Johnstone will be used. Satisfies the aesthetic perspective of the GUR.

### **THTR 230 - Playwriting (3 cr.)**

Playwriting is a participatory, workshop style class. Students will become equipped with the basic literary and dramatic skills to write a 10 minute play. The 10 minute play is a hot commodity for playwrights, and is an easy way to have their work seen, read by peers, and most importantly, brought to the stage. Students will work toward having a staged reading of their final piece by the end of the semester, as well as prepare their plays to be sent to competitions and festivals.

This course satisfies the Aesthetics Perspective of the GUR and the Arts & Sciences writing intensive requirement.

### **THTR 290 - Special Topics in Theatre (3 cr.)**

Topics in theatre that are not offered on a regular basis are examined. This course may be repeated for credit if the topic varies.

### **THTR 333 - Independent Study in Theatre (1-3 cr.)**

See "Independent Study".

**THTR 334 - Independent Study in Theatre (1-3 cr.)**

See "Independent Study".

**THTR 390 - Special Topics in Theatre (3 cr.)**

Topics in theatre that are not offered on a regular basis are examined.  
This course may be repeated for credit if the topic varies.



## GRADUATE AND PROFESSIONAL DEGREE PROGRAMS - GENERAL INFORMATION

### Academic Performance

Graduate students are expected to maintain a high degree of academic excellence in all of their studies.

A graduate student must have a minimum grade point average of 3.0 in all courses applied toward the degree in order to qualify for a graduate degree. Subject to the approval of the dean of the college within which the student is enrolled, a course with a grade of "C+" or lower may be repeated and the grade point average will be computed on the basis of the most recent earned grade. Credit for the course will be awarded only once. The official transcript will show the complete record.

In cases where a course grade of "F" has been assigned as a penalty for academic dishonesty, the student may not replace that grade in the cumulative GPA. If the student is allowed to retake the course, the resulting grade will be counted as a separate course.

Any student who receives three or more grades of "C+" or lower, or two or more grades of "F" will be dismissed from the program. With regard to dismissal, all grades in all courses are considered. In all cases where a letter of intent to dismiss for academic reasons has been sent, the student has the right to appeal to the Graduate Committee within two weeks of the notice. If an appeal is successful and the student is allowed to continue, the conditions of continuance are spelled out for the student in a letter. If an appeal is unsuccessful, or if no appeal is filed, the student is formally dismissed and such action becomes part of the permanent record.

Graduate students who are conditionally re-admitted must fulfill all the conditions set forth by the appropriate Dean at the time of admission. Those conditions are recorded on the degree audit and are duly noted when satisfied.

Graduate courses in the Colleges of Arts and Sciences, Business, and Engineering may be audited on a space-available basis by alumni who have completed bachelor's or master's degrees at Western New England University and who also have the listed prerequisites for the course selected. Alumni may register to audit classes through Student Administrative Services. Courses in the School of Law are not available for alumni auditors. The University does not maintain any record of registration by alumni auditors.

### Award Of Degrees Policy

The University does not guarantee the award of a degree or a certificate of satisfactory completion of any course of study or training program to students enrolled in any instructional or training program. The award of degrees and certificates of satisfactory completion is conditioned upon satisfaction of all current degree and instructional requirements at the time of such award, compliance with all University policies and regulations, as well as meeting bona fide expectations of the faculty.

#### *POLICY on the POSTHUMOUS CONFERRAL OF DEGREES*

This policy establishes the criteria for Western New England University to recognize the academic achievements of students enrolled at the time of their death. A degree awarded posthumously acknowledges the completion of a significant part of the academic degree requirements and recognizes the student's good standing with the university.

### Requirements for Awarding Posthumous Degrees

Western New England University will consider the posthumous awarding of a degree in the program that the student was pursuing at the time of death, provided that the deceased student completed at least 75% of credit hour requirements, with at least 30 credits taken at WNE.

#### Process and further criteria

1. A request for the awarding of a posthumous degree may be initiated by the deceased student's family, or by the student's advisor, program chair, or academic dean. The request is made to the Provost.

2. The Registrar will review the student's record to determine whether the student has met the following criteria:

- in good academic standing.
- in good disciplinary and social standing, as determined by the Office of Student Affairs.
- the student has the endorsement of the school/college Dean.

3. The Provost shall have final approval of the awarding of a posthumous degree once the above criteria have been confirmed by the Registrar.

4. Upon approval by the Provost, the Provost will notify the Registrar, who shall coordinate with the Vice President of Student Affairs to make any arrangements with the student's family. If the family wishes, the appropriate degree will be awarded at the Commencement at which the student would have been otherwise recognized or at a similar ceremony acceptable to the University and the student's family. The student's family will be asked to identify an appropriate person to receive the diploma when the student is recognized at the appropriate time in the Commencement ceremony. Except for the fact that the individual receiving the diploma on behalf of the student shall not be attired in cap or gown, there shall be no other changes in the ceremony.

5. Existing balances in the student's account shall be forgiven.

6. The student's name in the commencement program shall be listed, parenthetically noted as "Posthumous". The diploma and transcript will say, "Awarded Posthumously."

### Credit Hour Policy

WNE adheres to the definition of a credit hour established by the New England Commission on Higher Education (NECHE) (effective in 2011 and updated in 2021). A credit hour is

an amount of work represented in intended learning outcomes and

verified by evidence of student achievement that is consistent with commonly accepted practice in postsecondary education and that reasonably approximates not less than

(1) One hour of classroom or direct faculty instruction and a minimum of two hours of out of class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or ten to twelve weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time; or

(2) At least an equivalent amount of work as required in paragraph (1) of this definition for other academic activities as established by the institution including laboratory work, internships, practica, studio work, and other academic work leading to the award of credit hours.

For a standard 15-week semester at WNE, one credit hour approximates 2100 minutes over 14 weeks: approximately 700 minutes of in-class or direct faculty instruction delivered in meetings of at least 50 minutes plus a minimum of 1,400 minutes of out-of-class student work. The fifteenth week is reserved for exams. At least an equivalent amount of work is required for credits earned in courses that meet outside the standard 15-week semester.

## Grading System

In certain graduate courses (ENGL 550, ENGL 555, and EMGT 770-779) a grade of "P" (Pass) is assigned if the course is satisfactorily completed. "P" has no grade point equivalent.

Additional information regarding grading in the professional courses is available in the handbooks for School of Law @ <http://www1.wne.edu/law/current/student-handbook.cfm> and the College of Pharmacy and Health Sciences @ <http://www1.wne.edu/pharmacy-and-health-sciences/current/student-handbook.cfm>

Work in graduate and professional courses is graded as follows:

	A (4.0)		
	A- (3.7)	B+ (3.3)	
	B (3.0)		
	B- (2.7)	C+ (2.3)	C (2.0)
	P (0)		
Failure	F (0)		

## Incomplete Work

An incomplete grade of "I" is awarded only when work is not completed due to circumstances beyond the student's control (such as serious illness). The student has six weeks from the last day of final class and/or examinations to satisfy course requirements. Extension may be granted only for continued circumstances beyond the student's control and must be approved by the instructor and the dean of the college. The "I" becomes "F" for work not completed after the six weeks, or by the conclusion of an approved extension period.

## Requirements for a Master's Degrees

In order to qualify for a master's degree, a student must:

- Be formally admitted to the degree program.
- Complete the required programs as approved by the dean of the degree-granting college within eight years prior to the date of graduation. All graduate courses transferred into the programs must be taken within this eight-year period as well.
- Apply no more than six credit hours of transfer credit toward 30-credit graduate programs or 12 credit hours of transfer credit toward 600-level courses in any graduate program requiring 36 or more credit hours. An exception is made for WNE undergraduates taking graduate credits as described in the Special Academic Opportunities (p. 25) section of the catalogue or who are concurrently enrolled in one of the University's dual degree programs. Normally, the final courses are to be taken at Western New England University, but in exceptional circumstances students may apply to the appropriate Dean to have their final one, two, or three courses approved to be taken elsewhere.
- Take at least 24 credit hours of the master's degree graduate course requirements at the University.
- Attain an overall grade point average of 3.0 or higher. Overall average is the average of all courses that are applied toward the degree. The degree audit shows the grade point average in all courses completed to that point.
- A student continuously enrolled, with no interruption of academic program longer than one semester or two terms absence, is expected to fulfill the requirements of the catalogue current at the time of admission to the University. A student not continuously enrolled is expected to meet the requirements current at the time of readmission. A one-year leave of absence may be granted at the discretion of the appropriate dean.
- Complete an Application for Degree form, which will place the student's name on the graduation list for October, February, May, or August graduation as appropriate.

## Strategic Initiatives

The Center for Strategic and Academic Initiatives (p. 35)' primary goal is international recruitment of students and development of undergraduate and graduate degree programs (traditional, professional, online, alternative/intensive scheduling, on-site, off site, graduate full- and part-time interdisciplinary, "boutique" in nature, in-house or outsourced, etc) as well as non-credit/certificate programs. The Center will serve as an incubator to implement credit and non-credit programs and degrees that the University determines should be launched to take advantage promptly of opportunities that are sought out or that present themselves and that permit the University to reach new audiences. In addition, the Center and the Office of Professional Development Programs is responsible for the development of new continuing education and non-credit opportunities to meet employer, employee, professional, and personal development needs within our region. This initiative may include the development and implementation of new graduate programs, and the development of other entrepreneurial opportunities.

## Withdrawal

### *W (Withdraw)*

To withdraw from a course the student must complete a drop form or application for complete withdrawal available from Enrollment Services or the appropriate college. Absence from class without

completing the form does not constitute withdrawal and may result in a failing grade.

If the student withdraws from a course within the first two weeks of the semester, or during the period published in the summer session schedule, no grade is assigned. A grade of “W” indicates that the student withdrew after the second week of classes, but before the date published in the Academic 11-week Graduate Term Calendar.

A grade of “W” carries no academic penalty or prejudice.

### **Undergraduate Student Registration for Graduate-Level Courses**

See Undergraduates Taking Graduate Courses (p. 33)

## GRADUATE AND PROFESSIONAL DEGREE PROGRAMS

### Graduate Programs in College of Arts and Sciences

#### Applied Behavior Analysis

#### Master of Science in Applied Behavior Analysis

Developed in response to the increasing demand for teachers and practitioners trained in best practices for the education and treatment of individuals with autism and related disabilities, the Master's Program in Applied Behavior Analysis at Western New England University will give working professionals the skills to fill this void. Through a combination of coursework and supervised practical experiences, students completing this program will earn a master's degree in Applied Behavior Analysis and meet the Behavior Analysis Certification Board (BACB) requirements for taking the exam to become Board Certified Behavior Analysts.

#### Program Structure

All students will be assigned doctoral-level, Board Certified Behavior Analysts as advisors upon admission to the program. Advisors and students will work collaboratively on the students' professional development. Students are expected to complete 37 total credit hours with 21 credit hours dedicated to core coursework designed to meet the BACB requirements, 6 credit hours of elective coursework, and 10 hours of practicum. Each student must complete and successfully defend a research thesis.

Students will be expected to enroll in 4 credit hours in each term to stay on pace to complete the master's program in three years.

#### Degree Requirements

##### Core courses (21 hours)

PSY 501	Principles of Behavior Analysis	3 cr.
PSY 502	Behavioral Assessment	3 cr.
PSY 503	Behavioral Interventions	3 cr.
PSY 505	Methods of Evaluation	3 cr.
PSY 506	Evidence-based Teaching	3 cr.
PSY 509	Ethics and Professional Issues	3 cr.
PSY 515	Personnel Management and Supervision	3 cr.

**Subtotal: 21**

##### Elective courses (6 hours)

PSY 504	Autism and Related Disabilities	3 cr.
PSY 507	Theoretical Foundations	3 cr.
PSY 508	Verbal Behavior	3 cr.
PSY 590	Special Topics in Applied Behavior Analysis	3 cr.

**Subtotal: 6**

##### Practica (10 hours)

PSY 519-528	Supervised Practicum in ABA	1 cr.
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**Subtotal: 10**

Subtotal: 37

Total Credit Hours: 37

#### Admissions

Candidates need to have earned a minimum of a bachelor's degree and must have earned at least a 3.0 grade point average in their bachelor's program. A combined score of 1000 on the verbal and quantitative sections is required for full admission to the program.

#### English

#### Master of Arts in English for Teachers

#### Purpose

The Master of Arts in English for Teachers program is designed primarily for middle school and secondary school teachers who have an initial license and need a master's degree for final professional licensure, who want Professional Development Points, or who are interested in continuing their study of English. English majors who have graduated from college but who have not completed the requirements necessary for initial licensure, current teachers who do not have an initial license, and professionals who have decided on a career change may also be interested in the program (in order to become qualified teachers, in addition to establishing English competencies, these students, on their own, must take certification tests, fulfill state requirements, and complete a practicum). The program is designed to be inspiring, engaging, and challenging. By emphasizing the breadth and depth of subject matter, it deepens passion for the language arts and literature.

#### Competency areas

The program stresses four competency areas: writing, speaking, reading/studying literature, and contemporary issues in the teaching of English.

##### Writing

- Becoming a more accomplished writer, including learning how to present a topic in a variety of forms, to specialized audiences
- Learning how to do intensive research, both online and in the library and demonstrating proficiency in the use of standard reference materials and journals
- Mastering the grammar, mechanics, and rhetoric of English

##### Speaking

- Advancing oral presentation skills

##### Reading/studying literature

- Understanding the hierarchy of skills involved in the reading process, with emphasis on critical analysis of literary works, emphasizing the assessing of needs, and the approaches for remedies
- Becoming conversant with literary figures/schools/eras in British and American literature within historical and cultural context
- Becoming conversant with literary terminology, including characteristics of genres
- Becoming aware of different schools of literary criticism

##### Contemporary Issues in English

- Knowing the socio-cultural issues related to the English language
- Developing awareness of contrastive rhetoric
- Using technology to teach English

- Establishing connections between English and other disciplines

## Degree Requirements

### Array of Courses

Students choose 9 courses from among the courses below in addition to the ENGL 570 Capstone Seminar.

MAET 552	Advanced Grammar	3 cr.
MAET 553	Teaching Writing in the English Curriculum	3 cr.
MAET 554	Teaching English in the Multicultural Classroom	3 cr.
MAET 556	The Reading Process in the English Curriculum	3 cr.
MAET 560	Literary Studies- Shakespeare and The Elizabethan Age	3 cr.
MAET 561	Literary Studies- Poetry	3 cr.
MAET 563	Literary Studies- Genres	3 cr.
MAET 564	Literary Studies- Cultural- Literary Connections	3 cr.
MAET 565	Literary Studies- Great Works of American Literature	3 cr.
MAET 566	Literary Studies- Modern American Literature	3 cr.
MAET 570	Capstone Project	3 cr.
MAET 590-596	Special Topics in MAET	1-3 cr.

**Subtotal: 30**

All courses have connection to the Frameworks and are determined by the backgrounds of the students enrolled in the program.

### Structure

- The program is designed for part-time participation; all courses are offered online synchronously or asynchronously in the early evening.
- To complete the program, a student must take 10 courses (30 credit hours), at least seven of which must be English courses, and at most three of which can be education courses.
- The program uses the 15-week semester calendar to include two courses per semester, summers included, with courses sequenced to run every two years/every three summers.

### Requirements

The program requires 10 courses, at least five of which must be core English courses and at most five of which can be non-core English courses.

Students will be required to have an overall GPA of 3.00 or higher to become a degree candidate.

## Mathematics

### Master of Arts in Mathematics for Teachers

#### Purpose

The Master of Arts in Mathematics for Teachers degree program is designed primarily for middle school and secondary school teachers who have an initial license and need a master's degree for final professional licensure, who want Professional Development Points, or who are interested in continuing their study of mathematics. Mathematics majors who have graduated from college but who have not completed the requirements necessary for initial licensure, current teachers who do not have an initial license, and professionals who have decided on a career change may also be interested in the program (in order to become qualified teachers, in addition to establishing Mathematics competencies, these students, on their own, must take certification tests, fulfill state requirements, and complete a practicum). The program is designed to be inspiring, engaging, and challenging.

The broad challenge of mathematics education at all levels is to actively engage students in mathematical thinking. Mathematics education must have immediacy and relevance to attain this goal. Excellent teaching of mathematics occurs when the teacher has a broad-based, in-depth understanding of content coupled with an understanding of how pedagogy and technology can significantly enhance learning environments. This program is structured so that the scholar-teachers will be active participants in a learning process committed to content, pedagogy, and technology.

#### Program Objectives

The program provides instruction and support for scholar-teachers in achieving the following objectives. It is our purpose that our students:

- Learn mathematical habits of mind
  - Correctly apply inductive and deductive reasoning skills.
  - Demonstrate correct use of formal mathematical language and ability to compose a mathematical proof.
  - Demonstrate the ability to successfully apply mathematical computations and algorithms.
  - Understand the connections between different branches of mathematics, as well as between mathematics and other disciplines.
- Demonstrate fluency in mathematical communication/link content knowledge to classroom experience.
  - Write about mathematics correctly and in a clear manner.
  - Develop proficiency in introducing advanced mathematical concepts to the classroom.
- Use technology relevant to mathematics.
  - Use relevant and current technology to aid the understanding of new mathematical concepts and to solve difficult problems.
  - Interpret and communicate correctly the results from the technology.

#### Structure

The program is a part-time online graduate program with courses offered synchronously during the fall 11-week term, the spring 15-week semester, and summer 8- or 12-week session. One or two mathematics courses are typically offered each term or semester, running two days a week, in the late afternoon or early evening, at

hours convenient for the expected teacher audience. Free online tools, like shared whiteboards and mathematical web apps, are provided to allow for an interactive online class experience in real time. Both online and in-person office hours are held and accessible Zoom links provided for online classroom spaces for students to congregate and study during non-class hours.

The courses will be sequenced to run every three years, so that it would be possible to complete all degree requirements in about 2 1/2 years. The degree requires the completion of 10 courses. The program also allows students to commit to a longer period of stay to complete the degree and allows students to enroll in courses without an interest in obtaining the degree if they so desire. Upon admission into the program, the student will be assigned a faculty advisor who will work closely with the student in identifying a curriculum that best suits the objectives and needs of the student.

### Requirements

The program requires 10 courses (30 credit hours), at least five of which must be core mathematics courses and at most five of which can be non-core mathematics courses. Students will be required to have an overall GPA of 3.00 or higher to become a degree candidate.

### Degree Requirements

#### Core Mathematics:

At least five, must be core mathematical courses:

MAMT 550	Discrete Mathematics	3 cr.
MAMT 552	Geometry Revisited	3 cr.
MAMT 554	Number Theory	3 cr.
MAMT 556	Graph Theory	3 cr.
MAMT 561	Probability	3 cr.
MAMT 564	Analysis	3 cr.
MAMT 566	Algebraic Structures	3 cr.
MAMT 568	Mathematical Modeling	3 cr.
MAMT 570	The Mathematics of Symmetry	3 cr.
MAMT 574	Origami in Math and Education	3 cr.
MAMT 590-593	Special Topics in Mathematics (if designated as core)	1-3 cr.

**Subtotal: 15**

#### Non-Core Mathematics:

At most five, can be non-core mathematical courses:

MAMT 540	Calculus Revisited: Theory and Applications	3 cr.
MAMT 542	History of Mathematics	3 cr.
MAMT 543	Linear Algebra	3 cr.
MAMT 544	Creative Problem Solving in Mathematics	3 cr.
MAMT 545	Cryptology	3 cr.
MAMT 546	Chance	3 cr.
MAMT 547	Statistics	3 cr.
MAMT 548	What is Mathematics?	3 cr.

MAMT 590-593	Special Topics in Mathematics (if designated as non-core)	1-3 cr.
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**Subtotal: 15**

Total Credit Hours: 30

Doctoral Program in Behavior Analysis

### Doctoral Program in Behavior Analysis

#### General Information

Developed in response to the increasing demand for scientists and practitioners of evidence-based methods for the education and treatment of individuals with autism and related disabilities, the PhD program in Behavior Analysis at Western New England University will give you the skills to fill this void and become a leader in the field. Through a combination of coursework and supervised practical and research experiences, the aim of the Department of Psychology is to train researchers and scientist-practitioners in the discovery, translation, and application of knowledge toward solving human behavior problems of societal importance (e.g., autism and related disabilities). All classroom course work is done at the New England Center for Children.

#### Program Goals and Objectives

The program will allow students to successfully embark on academic and research careers, as well as careers in the delivery of behavior analysis services. Thus, the primary objectives of our program, which elucidate the core knowledge areas and skills all students are expected to know or be able to do prior to graduating, are:

1. To understand the assumptions, goals, and characteristics of behavior analysis
2. To understand the history of the field of behavior analysis and its relation to psychology and science in general
3. To understand the basic principles of learning and the past and current theoretical models which describe and attempt to explain behavior-environment relations
4. To be able to describe and apply effective behavior-analytic procedures for promoting behavior change
5. To be able to describe and apply single-subject and more traditional group designs
6. To be able to determine the influence of relevant independent variables or interventions
7. To be able to describe, depict, and analyze behavioral data and understand the current quantitative models which describe and attempt to explain behavior-environment relations
8. To be able to describe, distinguish, and apply evidence-based practices for a social problem (e.g., problems associated with autism and related developmental disabilities)
9. To understand a professional culture outside of behavior analysis that is united to better understand and improve conditions relevant to a particular social problem
10. To be able to identify, review, critically analyze, and contribute to the behavioral science and psychological literature
11. To be able to articulate and work within the ethical standards of the Behavior Analysis Certification Board and the American Psychological Association

- 12. To be able to effectively participate in professional behavioral science activities such as presenting, publishing, and reviewing original research
- 13. To be able to design and implement effective instruction at the college level

**Program Structure**

All students are assigned an advisors upon admission to the program. The student and advisor share equal responsibility in planning for the student’s academic success and ensuring that the student is making timely progress toward the degree requirements. Thus, advisors assist students as they select required and elective courses, develop their research projects, and prepare for PhD requirements (e.g., assist in selecting a review paper topic). Advisors and students also work collaboratively on the students’ professional development. Specifically, advisors assist students in clarifying their goals and attaining substantive experience in teaching (e.g., identifying opportunities and mentoring), research (e.g., ensuring that the student is presenting posters, oral presentations, and is publishing their data where appropriate), and service (e.g., committee work at the local or national level, serving as a reviewer for a journal).

Students are expected to complete 54 credit hours with at least 27 of those hours being seminars (the remaining 27 may be dissertation credit, behavior analysis practica, and additional elective seminars). Courses will be offered in three of the four 11-week terms scheduled by the Western New England University Graduate Program (fall, winter, and spring terms).

Students are expected to enroll in 7 total credits in three of the four terms in each of the initial two years of the program. Students are expected to enroll in a total of 4 credits in three of the four terms in the third year of the program. Students not finished with the program by the end of the third year register for 1 credit of dissertation continuance in up to three terms of their fourth year and all subsequent years until completion of all degree requirements. The program must be completed within seven years.

**Degree Requirements**

Core courses (15 hours)

PSY 610	Professional Issues, Ethics, and Research Design	3 cr.
PSY 620	Experimental Analysis of Behavior	3 cr.
PSY 630	Descriptive and Inferential Statistics	3 cr.
PSY 640	Quantitative Analysis of Behavior	3 cr.
PSY 650	The Philosophy of Behaviorism	3 cr.
		<b>Subtotal: 15</b>

Concentration courses (12-21 hours)

PSY 705	Early Intensive Behavioral Intervention	3 cr.
PSY 720	Assessment of Severe Behavior Disorders	3 cr.
PSY 735	Organizational Behavior Management	3 cr.
PSY 740	Developmental Psychology	3 cr.
PSY 750	Advanced Verbal Behavior	3 cr.

PSY 770	Teaching in the College Environment	3 cr.
PSY 780	Brain and Behavior	3 cr.
PSY 790	Special Topics in Behavior Analysis	3 cr.

**Subtotal: 12-21**

Behavior Analysis Practica (9 hours)

PSY 801-809	Behavior Analysis Practica	1 cr.
		<b>Subtotal: 9</b>

Dissertation Research (9-18 hours)

PSY 851-856	Dissertation Research	3 cr.
PSY 857 - 880	Dissertation Research Continuance	1 cr.

**Subtotal: 9-18**

**Example Program of Study**

The following table provides the anticipated schedule with which courses and program requirements may be completed.

**Degree Requirements**

Year 1 - Fall

PSY 610	Professional Issues, Ethics, and Research Design	3 cr.
PSY 620	Experimental Analysis of Behavior	3 cr.
PSY 801-809	Behavior Analysis Practica	1 cr.

Year 1 - Winter

PSY 630	Descriptive and Inferential Statistics	3 cr.
PSY 650	The Philosophy of Behaviorism	3 cr.
PSY 801-809	Behavior Analysis Practica	1 cr.

Year 1 - Spring

PSY 640	Quantitative Analysis of Behavior	3 cr.
PSY 705	Early Intensive Behavioral Intervention	3 cr.
PSY 801-809	Behavior Analysis Practica	1 cr.

Year 2 - Fall

PSY 740	Developmental Psychology	3 cr.
PSY 851-856	Dissertation Research	3 cr.
PSY 801-809	Behavior Analysis Practica	1 cr.

Dissertation Proposal may be submitted\*

Year 2 - Winter

PSY 770	Teaching in the College Environment	3 cr.
PSY 851-856	Dissertation Research	3 cr.
PSY 801-809	Behavior Analysis Practica	1 cr.

## Year 2 - Spring

PSY 750	Advanced Verbal Behavior	3 cr.
PSY 851-856	Dissertation Research	3 cr.
PSY 801-809	Behavior Analysis Practica	1 cr.

Comprehensive Program of Study or Review Paper may be submitted and defended

## Year 3 - Fall

PSY 851-856	Dissertation Research	3 cr.
PSY 801-809	Behavior Analysis Practica	1 cr.

## Year 3 - Winter

PSY 851-856	Dissertation Research	3 cr.
PSY 801-809	Behavior Analysis Practica	1 cr.

## Year 3 - Spring

PSY 851-856	Dissertation Research	3 cr.
PSY 801-809	Behavior Analysis Practica	1 cr.

Dissertation may be defended

**Admissions**

Candidates interested in this program need to have earned a master's degree in behavior analysis or related discipline or be certified as a master's-level behavior analyst by the Behavior Analysis Certification Board. Candidates must also have earned a minimum of a 3.6 grade point average (GPA) in their master's degree program and a combined verbal and quantitative score of 300 on the Graduate Record Exam (GRE) with neither score being below 150 for full admission. The program accepts students who have met these requirements and who show strong potential as scholars and future leaders in the field of behavior analysis.

**Graduate Programs in College of Business**

The programs of graduate study offer advanced education to enhance the professional competence of those employed in business or those preparing to enter professional careers. To offer students maximum flexibility and high quality programming, our faculty merge changing technologies with sound and proven best teaching practices, providing innovative delivery models unique to and tailored for each program.

Study in the graduate business program will lead to a certificate in Leadership, Sport Leadership, the Master of Business Administration (MBA), Master of Science in Accounting (MS in Accounting), Master of Science in Organizational Leadership (MS in Organizational Leadership) or Master of Science in Sport Leadership and Coaching (MS in Sport Leadership and Coaching) degree. There are also special dual degree options for students pursuing a College of Business graduate degree and who have been accepted to the Western New England University School of Law, College of Engineering, or College of Pharmacy and Health Sciences.

Note that if a student enrolls in any Dual Degree program, or opts to pursue more than one Business graduate degree, only 3 courses (9 credits) are allowed between Business graduate degrees. Only 3 courses (9 credits) from other College or School Degrees (Law, Engineering, or Pharmacy) are accepted into a Business Graduate Degree.

**Master of Business Administration**

Managers today have to operate in a rapidly changing and uncertain environment, ready for any situation, good or bad, that requires skilled decision-making. Anticipating and responding to these changes in positive ways is what will distinguish the successful manager.

**Program Learning Goals**

The Master of Business Administration (MBA) program is designed to develop and enhance the skills of those who hold or aspire to hold management responsibilities within organizations. Students attain a theoretical understanding and demonstrate a practical grasp of the management skills required to effectively negotiate a turbulent business environment. Knowledge and skills will be developed through theoretical study and experiential activities. Upon completion, successful students in the MBA program will be able to exhibit their knowledge of business and management in a global and multicultural context in the following ways:

**Strategic:** Apply a strategic mindset in managing the long-term value of the organization.

**Entrepreneurial:** Apply an entrepreneurial and sustainable mindset to a diverse global context.

**Leadership:** Apply a leadership mindset to organizational challenges and opportunities.

**Analytics & Systems:** Apply an analytics & systems mindset to managing the complexity of the organization and its stakeholders

**Admissions Standard**

As an AACSB International accredited institution, the College of Business requires all applicants to satisfy specific core business knowledge requirements within six months of entry into the graduate business programs. This core knowledge includes an introductory understanding of accounting, finance, and quantitative methods. Additionally, coursework in the MBA program requires a moderate level of proficiency in computer skills, including the use of Microsoft Office (specifically Word and PowerPoint) and the internet. Of particular importance is an above average knowledge of Excel software skills. Applicants must demonstrate competency in each of the areas mentioned above in one of the following ways:

- Completion of an undergraduate business degree (typically a 'B' 3.0 or better average with no grade below a 'C') in relevant core coursework.
- Completion of relevant undergraduate coursework in the following areas with acceptable performance (typically a 'B' 3.0 or better average with no grade below a 'C').
  - Accounting: Financial Reporting
  - Finance: Introduction to Corporate Finance
  - Quantitative Methods: Introduction to Statistics
- Completion of the Prerequisite Self Study modules available at Western New England University. Applicants may elect to complete self study modules that provide the necessary background to maximize the student's graduate business education experience. The self study modules are designed to be accessed online, with no required classroom involvement. These modules provide students with access to the prerequisite content material, problem sets for practice, and diagnostic self assessments. Those electing to complete the self study modules will need to validate their learning by successfully passing a final



test administered through the modules (notifying the College of Business to confirm exemption from prerequisite).

- Applicants may enroll in the self study modules at any time during the year. The modules are self-paced.

## MBA Program Structure

The MBA degree, earned after 36 credit hours of study, comprises core and elective coursework. Each area of coursework requires the following:

Core requirements: 27 credit hours

Elective requirements: 9 credit hours

Students who meet the admission standards for entry into the MBA program but have not completed the core knowledge requirement will be admitted under Tentative Status. Applicants to the MBA program who are in the process of completing the admission process may take two graduate business courses and work on satisfying the core knowledge requirement concurrently. If core knowledge requirements are not completed, students may not continue to take any additional 600 level courses (beyond two) until the requirements have been completed.

There is an option for students currently enrolled, or accepted to, the Western New England University School of Law to complete both the Juris Doctorate and the MBA in a unique combined degree program. Interested students should contact the School of Law Admissions Office and the College of Business Associate Dean's Office for specific information. There is also an option for students currently enrolled in the Western New England University College of Pharmacy and Health Sciences to complete both the PharmD and the MBA. Students enrolled in Western New England University College of Engineering Master of Science in Engineering Management (MSEM) can complete both the MSEM and the MBA.

## Degree Requirements

### Core Course Requirements 27 credit hours

Completion of the following courses is required:

MAN 605	Leadership, Problem Solving and Decision Making	3 cr.
BUS 610/MAN 611	Business and Its Environment	3 cr.
AC 630	Accounting for Decision Makers	3 cr.
FIN 630	Managerial Finance	3 cr.
BIS 610	Information Technology Management and Applications	3 cr.
MAN 610	Organizational Behavior and Theory	3 cr.
BIS 620	Decision Modeling for Analytics	3 cr.
MK 640	Marketing Management	3 cr.
BUS 680	Strategic Management	3 cr.
<b>Subtotal: 27</b>		

Subtotal: 27

The final course in the program is designed to integrate the knowledge learned in the core coursework to enhance student understanding of management practice.

Each course is three credits.

## Elective Course Requirements 9 credit hours

Students may choose to take elective courses based on their individual interests and professional needs. Throughout the program, students will be provided with a variety of elective course offerings in accounting, business information systems, finance, general business, management, and marketing. Elective courses can be taken at any time during the program. It is best, however, for students to plan on taking electives later in their MBA study after completing the majority of their foundation coursework.

## Master of Business Administration (MBA) Program Accounting Concentration

### Purpose

For interested students, a concentration in Accounting is available in the MBA program. Students with a background in Accounting can enhance their MBA by learning about relevant current issues and theoretical perspectives or develop their knowledge in areas such as taxation or fraud and legal issues. Students without a background in Accounting can enhance their MBA by gaining a deeper understanding of financial statements and an introductory understanding of relevant accounting issues in law, nonprofit accounting, or fraud. In addition to the MBA program learning goals, this concentration has the following learning goals:

- Demonstrate the ability to analyze reported financial performance and the impact of managerial choices on performance.
- Demonstrate the ability to understand and apply various other accounting concepts and areas, depending upon elective coursework chosen.

### Structure

The concentration consists of three courses.

## Degree Requirements

### MBA Core courses 27 credit hours

MAN 605	Leadership, Problem Solving and Decision Making	3 cr.
BUS 610/MAN 611	Business and Its Environment	3 cr.
AC 630	Accounting for Decision Makers	3 cr.
FIN 630	Managerial Finance	3 cr.
BIS 610	Information Technology Management and Applications	3 cr.
MAN 610	Organizational Behavior and Theory	3 cr.
BIS 620	Decision Modeling for Analytics	3 cr.
MK 640	Marketing Management	3 cr.
BUS 680	Strategic Management	3 cr.
<b>Subtotal: 27</b>		

Required Concentration Courses 9 credit hours  
(Undergraduate Degree Accounting recommended\*)

AC/FIN 6XX	Elective*	9 cr.
		<b>Subtotal: 9</b>

\*Recommended students with undergraduate degree in Accounting replace AC 630 with AC 6xx.

Options for Electives

AC 610	Cost-Based Decision-Making	3 cr.
AC 611	Municipal and Fund Accounting	3 cr.
AC 614	Fundamentals of Corporate and Partnership Tax	3 cr.
AC 620	Advanced Topics in Auditing and Assurance Services	3 cr.
AC 641	Fraud Examination	3 cr.
AC 642	Forensic Accounting	3 cr.
BL 640	Business Law	3 cr.
FIN 612	Business Analysis and Valuation	3 cr.

Total Credit Hours: 36

**Master of Business Administration (MBA)  
Business Law Concentration**

**Purpose**

For interested students, a concentration in Business Law is available in the MBA program. Students with an interest in Business Law can enhance their MBA by learning about relevant current legal issues and theoretical perspectives or develop their knowledge by exposure to a wide range of corporate and commercial topics. In addition to the MBA program learning goals, this concentration has the following learning goal:

- Demonstrate a working knowledge of legal subjects affecting business.

**Degree Requirements**

MBA Core courses 27 credit hours

MAN 605	Leadership, Problem Solving and Decision Making	3 cr.
BUS 610/MAN 611	Business and Its Environment	3 cr.
AC 630	Accounting for Decision Makers	3 cr.
FIN 630	Managerial Finance	3 cr.
BIS 610	Information Technology Management and Applications	3 cr.
MAN 610	Organizational Behavior and Theory	3 cr.
BIS 620	Decision Modeling for Analytics	3 cr.
MK 640	Marketing Management	3 cr.
BUS 680	Strategic Management	3 cr.

**Subtotal: 27**

Required Concentration Courses 9 credit hours  
(Undergraduate Degree Accounting)

LAWM 500 Intro to the Law	1 cr
LAWM 503 Contracts	2 cr
LAWM 507 Lawyering Skills I	4 cr

**Subtotal: 7**

Options for Additional Electives

Any additional courses from those listed with the Transactional Law Practice Concentration.

Total Credit Hours: 36

**Master of Business Administration (MBA)  
Program Leadership Concentration**

**Purpose**

For interested students, a concentration in Leadership is available in the MBA program. Students with an interest in Leadership can enhance their MBA by learning about relevant current issues and theoretical perspectives or develop their knowledge in areas such as leading change and ethical leadership. In addition to the MBA program learning goals, this concentration has the following learning goal:

- Demonstrate a working knowledge of leadership theory and current leadership best practices.

A student who completes an MBA with a Leadership Concentration may not also obtain a Leadership Certificate.

**Degree Requirements**

MBA Core courses 27 credit hours

MAN 605	Leadership, Problem Solving and Decision Making	3 cr.
BUS 610/MAN 611	Business and Its Environment	3 cr.
AC 630	Accounting for Decision Makers	3 cr.
FIN 630	Managerial Finance	3 cr.
BIS 610	Information Technology Management and Applications	3 cr.
MAN 610	Organizational Behavior and Theory	3 cr.
BIS 620	Decision Modeling for Analytics	3 cr.
MK 640	Marketing Management	3 cr.
BUS 680	Strategic Management	3 cr.

**Subtotal: 27**

Required Concentration Courses 9 credit hours  
(Undergraduate Degree Accounting recommended\*)

MAN 6XX	Elective	9 cr.
		<b>Subtotal: 9</b>

\*Recommended students with undergraduate degree in Accounting replace AC 630 with AC 6xx.

#### Options for Electives

MAN 600	Foundations of Leadership Practice	3 cr.
MAN 630	Leadership and the Human Experience	3 cr.
MAN 642	Leading Change	3 cr.
MAN 651	Ethical Leadership Practice	3 cr.
MAN 652	Contemporary Issues in Leadership	3 cr.

Total Credit Hours: 36

### Juris Doctor/Master of Business Administration

The College of Business and School of Law at Western New England University have collaborated to offer a program unique to western Massachusetts for those students interested in attaining their MBA while pursuing a career in law. This is a dual degree program, where students completing the requirements for each program will receive two separate degrees, one in business and one in law. Pursuing both degrees allows students to take advantage of cross credits, where nine credits of business coursework can be applied toward the 88 credits required for the JD degree, and, nine credits of law coursework can be applied toward the 36 credits required for the MBA degree.

This is a structured program designed to meet the guidelines delineated by the American Bar Association and AACSB International accreditation. Candidates for the program must have a four-year undergraduate degree from an accredited college or university. Students are required to apply to both the MBA program through the College of Business and the JD program through the School of Law. Those interested in this degree option should contact the School of Law Admission Office and College of Business Associate Dean's Office for specific information on application for admissions.

### Pharmacy Doctorate/Master of Business Administration

The College of Business and the College of Pharmacy and Health Sciences at Western New England University have collaborated to offer a program unique to western Massachusetts for those students interested in attaining their MBA while pursuing a career in pharmacy. This is a dual degree program, where students completing the requirements for each program will receive two separate degrees, one in business and one in pharmacy. Pursuing both degrees allows students to take advantage of cross credits, where 6 credits of business coursework can be applied toward the 146 credits required for the PharmD degree, and, nine credits of pharmacy coursework can be applied toward the 36 credits required for the MBA degree.

This is a structured program designed to meet the guidelines delineated by the American Council Pharmaceutical Education (ACPE) and AACSB International accreditation. Candidates for the MBA degree must have completed the PharmD degree or have a

four-year undergraduate degree from an accredited college or university to be awarded the MBA. Those interested in this degree option should contact the College of Pharmacy and Health Sciences Admission Office and College of Business Associate Dean's Office for specific information on application for admissions.

### Master of Science in Accounting (MS in Accounting)

#### Purpose

The Master of Science in Accounting degree provides students with the opportunity to develop skills in planning, controlling, evaluation, and analysis that characterize a successful career in accounting. Graduates of this program satisfy the requirements to sit for the CPA exam in Massachusetts. Graduates of this program who have an undergraduate degree in business are also eligible to sit for the CPA exam in Connecticut. Students taking the CPA exam in other jurisdictions must check the requirements of the respective jurisdiction.

#### Program Learning Goals

- 1: Analyze business decisions using the core accounting skills of reporting, audit, tax, and technology.
- 2: Create financial information through business reporting and analysis.
- 3: Evaluate financial choices with tax compliance and planning skills.
- 4: Understand the risks and rewards to business through information systems and controls.
- 5: Demonstrate proficiency in using ethical reasoning skills.

#### Admissions Standards

See graduate admissions requirements. (p. 12)

#### Academic Performance

The academic standards (p. 320) apply to students in the MS in Accounting program with the following exception:

Any student who receives two or more grades of "C+" or lower will be dismissed from the program.

#### Structure

The MS in Accounting consists of three areas: undergraduate foundation courses, required accounting courses, and elective courses. These three areas are discussed below.

### Degree Requirements

#### Undergraduate Foundation Courses 24 credit hours

AC 101/HONB 203	Financial Reporting I	3 cr.
AC 202	Managerial Accounting	3 cr.
AC 305	Financial Reporting II	3 cr.
AC 306	Financial Reporting III	3 cr.
AC 313	Taxation of Individuals	3 cr.
AC 330	Accounting Information Systems	3 cr.
AC 419	Auditing and Assurance Services	3 cr.
AC 440	Accounting Analytics	3 cr.

**Subtotal: 24**

Students admitted into the MS in Accounting program must have completed the undergraduate courses with a “B” average or better and no grade below a “C.” For purposes of admission only the highest grade achieved in each of the undergraduate courses will be considered. Students who are lacking some or all of the undergraduate foundation courses may be conditionally admitted to the program but must complete all remaining undergraduate core courses within a two-year period. During this time they will be allowed to take no more than two graduate courses toward the MS in Accounting degree. Grades on the undergraduate core courses taken after admission to the program will not be included in the GPA calculations of the program. The GPA calculation of the MS in Accounting program will be based solely on graduate coursework.

**Required Courses 21 credit hours**

AC 610	Cost-Based Decision-Making	3 cr.
AC 620	Advanced Topics in Auditing and Assurance Services	3 cr.
AC 621	Advanced Financial Accounting	3 cr.
AC 622	Accounting Theory & Contemp Issues	3 cr.
AC 646	Selected Topics in Taxation	3 cr.
FIN 612	Business Analysis and Valuation	3 cr.
FIN 630	Managerial Finance	3 cr.

**Subtotal: 21**

In addition to these courses, students complete their degree program by choosing electives or a concentration in Forensic Accounting and Fraud Investigation.

**Electives 12 credit hours**

GEN XXX	Electives	12 cr.
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**Subtotal: 12**

Students who have earned 24 undergraduate credit hours in non-accounting business courses are required to complete three graduate business courses (9 credit hours). This may be satisfied with the Forensic Accounting and Fraud Investigation concentration (AC 641, BL 640, and AC 642) or any three graduate business electives that would include at least one graduate Accounting Elective (excluding AC 630).

**Non-Accounting Business Elective Requirement**

Students who have taken less than two non-accounting undergraduate business courses must take four non-accounting graduate business electives (33 credits degree total). The non-accounting business course requirement can otherwise be fulfilled with either (a) at least 24 undergraduate non-accounting business credits, or (b) at least 18 non-accounting undergraduate business credits plus one graduate non-accounting business elective course (3 graduate credits), (c) at least twelve non-accounting undergraduate business credits plus two graduate non-accounting business elective courses (6 graduate credits) or (d) at least six undergraduate non-accounting business credits plus three graduate non-accounting business elective courses

(9 graduate credits). One non-accounting business course must be a business law course.

Subtotal: 57

## Forensic Accounting and Fraud Investigation Concentration

**Concentration Description**

The Forensic Accounting and Fraud Investigation concentration offers additional coursework in fraud investigation accounting, forensic accounting, and litigation support.

In addition to the MS in Accounting program leaning goals, this concentration has the following learning goals:

- Demonstrate an understanding of the accounting and legal fundamentals of forensic accounting and fraud investigation.
- Apply the concepts, tools, and techniques employed in financial investigation, including the role of the forensic accountant in litigation support.
- Learn the concepts and techniques employed in financial investigations.

**Degree Requirements****Required Courses****A. MS in Accounting Core courses 21 credit hours**

AC 610	Cost-Based Decision-Making	3 cr.
AC 620	Advanced Topics in Auditing and Assurance Services	3 cr.
AC 621	Advanced Financial Accounting	3 cr.
AC 622	Accounting Theory & Contemp Issues	3 cr.
AC 646	Selected Topics in Taxation	3 cr.
FIN 612	Business Analysis and Valuation	3 cr.
FIN 630	Managerial Finance	3 cr.

**Subtotal: 21****B. Required Concentration Courses 9 credit hours**

AC 641	Fraud Examination	3 cr.
AC 642	Forensic Accounting	3 cr.
BL 640	Business Law	3 cr.

**Subtotal: 9**

Subtotal: 30

Total Credit Hours: 30

**Non-Accounting Business Elective Requirement**

Students who have taken less than two non-accounting undergraduate business courses must take four non-accounting graduate business electives (33 credits degree total). The non-accounting business course requirement can otherwise be fulfilled with either (a) at least 24 undergraduate non-accounting business credits, or (b) at least 18 non-accounting undergraduate business credits plus one graduate

non-accounting business elective course (3 graduate credits), (c) at least twelve non-accounting undergraduate business credits plus two graduate non-accounting business elective courses (6 graduate credits) or (d) at least six undergraduate non-accounting business credits plus three graduate non-accounting business elective courses (9 graduate credits).

### Juris Doctor/Master of Science in Accounting

The College of Business and School of Law at Western New England University have collaborated to offer a program unique to western Massachusetts for those students interested in attaining their MS in Accounting while pursuing a career in law. This is a dual degree program, where students completing the requirements for each program will receive two separate degrees, one in business and one in law. Pursuing both degrees allows students to take advantage of cross credits, where 12 credits of business coursework can be applied toward the 88 credits required for the JD degree, and, six credits of law coursework can be applied toward the 30 credits required for the MS in Accounting degree.

This is a structured program designed to meet the guidelines delineated by the American Bar Association and AACSB International accreditation. Candidates for the program must have a four-year undergraduate degree from an accredited college or university. Students are required to apply to both the MS in Accounting program through the College of Business and the JD program through the School of Law. Those interested in this degree option should contact the School of Law Admission Office and College of Business Associate Dean’s Office for specific information on application for admissions.

Total Credit Hours: 88

### Master of Science in Engineering Management/Master of Business Administration

The Colleges of Business and Engineering offer a joint MS in Engineering Management/MBA for those in the engineering profession who want to advance their knowledge and improve their management career opportunities in engineering and technology-oriented companies. By pursuing the combined degree program, students earn the MS/MBA in 48 credits, taking advantage of 18 credits that can be applied to both degrees.

Candidates for the program must have a four-year undergraduate degree from an accredited college or university. Those interested in this degree option should contact the Admissions Office for specific information about the application process.

Total Credit Hours: 48

### Master of Science in Organizational Leadership (MS in Organizational Leadership)

**Purpose**

The Master of Science in Organizational Leadership (MS in Organizational Leadership) is designed to develop and enhance the knowledge and skills of those who hold or desire to hold leadership positions in organizations. Students are exposed to theories and best practices involving people and processes in organizations.

**Program Learning Goals**

A student will be able to:

1. Critically analyze research used to evaluate the unique needs, challenges, and opportunities of organizations.
2. Determine alternatives for problem solving and decision-making as they relate to human behavior issues in organizations.
3. Integrate knowledge of ethics and leadership into practice.
4. Apply knowledge of leadership theory, organizational behavior theory, and change theory as they relate to best practices in organizational leadership.
5. Demonstrate self-awareness of personal leadership style, strengths and skills, and how these impact others in an organization and a personal plan for leadership development.

**Admissions Standards**

See graduate admissions requirements. (p. 12)

**Academic Performance**

The academic standards (p. 320) apply to students in the MS in Organizational Leadership program with the following exception:

Any student who receives two or more grades of “C+” or lower will be dismissed from the program.

**Structure**

The MS in Organizational Leadership consists of:

### Degree Requirements

Degree requirements 21 credit hours

MAN 600	Foundations of Leadership Practice	3 cr.
MAN 605	Leadership, Problem Solving and Decision Making	3 cr.
MAN 610	Organizational Behavior and Theory	3 cr.
MAN 630	Leadership and the Human Experience	3 cr.
MAN 642	Leading Change	3 cr.
MAN 651	Ethical Leadership Practice	3 cr.
MAN 652	Contemporary Issues in Leadership	3 cr.

**Subtotal: 21**

Plus three 3-credit electives in Management or other graduate courses focused on leadership as approved

XXX	Major Elective	3 cr.
XXX	Major Elective	3 cr.
XXX	Major Elective	3 cr.

**Subtotal: 9**

Total Credit Hours: 30

### Juris Doctor/Master of Science (JD/MS in Organizational Leadership) in Organizational Leadership

The College of Business and School of Law at Western New England University have collaborated to offer a program unique to western Massachusetts for those students interested in a graduate leadership

program while pursuing a career in law. This is a dual degree program, where students completing the requirements for each program will receive two separate degrees, one in business and one in law. Pursuing both degrees allows students to take advantage of cross credits, where 6 credits of business coursework can be applied toward the 88 credits required for the JD degree, and, 6 credits of law coursework can be applied toward the 30 credits required for the MS in Organizational Leadership degree.

This is a structured program designed to meet the guidelines delineated by the American Bar Association and AACSB International accreditation. Candidates for the program must have a four-year undergraduate degree from an accredited college or university. Students are required to apply to both the MS in Organizational Leadership program through the College of Business and the JD program through the School of Law. Those interested in this degree option should contact the School of Law Admission Office and College of Business Dean's Office for specific information on application for admissions.

Total Credit Hours: 88

## Master of Science in Sport Leadership and Coaching (MS in Sport Leadership and Coaching)

### Purpose

The low-residency Master of Science in Sport Leadership and Coaching (MS in Sport Leadership and Coaching) provides advanced sport management education to individuals seeking managerial and/or athletic coaching positions in sport organizations. The sport leadership graduate degree provides students not only an in-depth understanding of the core concepts necessary to run critical program functional areas like marketing, fundraising, player evaluation, and team leadership but also facilitates the development of analytical abilities required to make sound business decisions. It fosters a deeper understanding of leadership theory, organizational dynamics, and team performance while exploring how individuals can motivate, build, and inspire a high performing team.

The MS in Sport Leadership features two one-week residencies, one offered at the beginning of the program, and the other, at the end of the program. Each residency will be facilitated by a series of graduate courses that will be offered online, with in-class sessions.

### Program Learning Goals

A student will be able to:

1. Understand theoretical foundations of leadership in the sport environment
2. Identify leadership style including strengths and challenges for the purpose of developing individualized leadership development plan
3. Understand the leader's role in creating and managing a high performing team both on the field and in the administrative offices
4. Develop understanding of sport governance, compliance, and legal issues related to sport organizations
5. Understand the sport organization as a business enterprise while learning effective approaches and techniques for developing and managing
  1. human resources—evaluating and recruiting both player

and administrative personnel

2. financial resources—fundraising, corporate sponsorship, and other revenue streams
6. Develop strategies to apply sport analytics principles in problem-solving and decision-making within the sport organization
7. Develop and apply sport research skills
8. Apply and practice sport leadership skills in mentored field experience either in a sport coaching or sport administrative setting

### Admissions Standards

See graduate admissions requirements. (p. 12)

### Academic Performance

The academic standards (p. 320) apply to students in the MS in Sport Leadership and Coaching program with the following exception:

Any student who receives two or more grades of “C+” or lower will be dismissed from the program.

### Structure

The MS in Sport Leadership and Coaching consists of:

### Degree Requirements

Three Residency Courses: SPMN 631, SPMN 634 and SPMN 635  
The residency consists of online delivery combined with a 6-day residency typically scheduled the last week of May into June. Students may take no more than two courses per residency and must complete two separate residencies.

### Graduate Management Electives – 2 courses - 6 credits

2 Courses (6 credits) of the following leadership foundations graduate courses currently offered through the College of Business in support of the MBA and MS. in Organizational Leadership degrees.

MAN 6XX	Management Elective	3 cr.
MAN 6XX	Management Elective	3 cr.

**Subtotal: 6**

### Mentored Field Experience and Research–Sport Industry Placement

SPMN 681	Athletic Focus Profession Issues and Research Project	3 cr.
SPMN 682	Coaching/Athletic Administration Mentored Field Experience	3 cr.

**Subtotal: 6**

### Sport Sequence

SPMN 631	Sport Leadership and Maximizing Team Performance	3 cr.
SPMN 632	Sport Analytics and Data Driven Decision Making	3 cr.
SPMN 633	Compliance and Governance of	3 cr.

	Sport and Athletic Organizations	
SPMN 634	Sport Agency, Player Personnel Evaluation and Management	3 cr.
SPMN 635	Resource Development and Program Promotion for Sport and Athletic Organizations	3 cr.
SPMN 6XX	Elective	3 cr.
		<b>Subtotal: 18</b>

Subtotal: 30

Total Credit Hours: 30

### JD/Master of Science in Sport Leadership and Coaching (dual degree program)

The JD/MS in Sport Leadership and Coaching (JD/MSLC) provides advanced sport management education to individuals seeking managerial and/or athletic coaching positions in sport organizations combined with the completion of a Juris Doctorate. The degree provides students the opportunity to earn a JD and an in-depth understanding of the core concepts necessary to run critical program functional areas like marketing, fundraising, player evaluation, and team leadership. The degree also facilitates the development of analytical abilities required to make sound business decisions, fosters a deeper understanding of leadership theory, organizational dynamics and team performance, and the exploration of how individuals can motivate, build, and inspire a high performing team. Pursuing both degrees allows students to take advantage of cross credits, where 6 credits of business coursework can be applied toward the 88 credits required for the JD degree, and, 9 credits of law coursework can be applied toward the 30 credits required for the MS in Sport Leadership and Coaching degree.

The JD/MS in Sport Leadership and Coaching (JD/MSLC) features two one-week residencies, one offered at the beginning of the program, and the other, at the end of the program. Each residency will be facilitated by a series of graduate courses that will be offered online, with some optional in-class sessions.

This is a structured program designed to meet the guidelines delineated by the American Bar Association and AACSB International accreditation. Candidates for the program must have a four-year undergraduate degree from an accredited college or university. Students are required to apply to both the MS in Sport Leadership and Coaching program through the College of Business and the JD program through the School of Law. Those interested in this degree option should contact the School of Law Admission Office and College of Business Dean's Office for specific information on application for admissions.

Total Credit Hours: 85

### Pharmacy Doctorate/Master of Science in Organizational Leadership (PharmD/MS in Organizational Leadership)

The College of Business and the College of Pharmacy and Health Sciences at Western New England University have collaborated to offer a program unique to western Massachusetts for those students interested in pursuing a graduate degree in leadership while pursuing

a career in pharmacy. This is a dual degree program, where students completing the requirements for each program will receive two separate degrees, one in business and one in pharmacy. Pursuing both degrees allows students to take advantage of cross credits, where 6 credits of business coursework can be applied toward the 146 credits required for the PharmD degree, and, nine credits of pharmacy coursework can be applied toward the 30 credits required for the MS in Organizational Leadership degree.

This is a structured program designed to meet the guidelines delineated by the American Council Pharmaceutical Education (ACPE) and AACSB International accreditation. Candidates for the MS in Organizational Leadership degree must have completed the PharmD degree or have a four-year undergraduate degree from an accredited college or university to be awarded the MS in Organizational Leadership. Those interested in this degree option should contact the College of Pharmacy and Health Sciences Admission Office and College of Business Associate Dean's Office for specific information on application for admissions.

Total Credit Hours: 88

### Five-year Bachelor/MBA Program

This program allows undergraduate students in the Colleges of Arts and Sciences, Business, or Engineering to accelerate the completion of both the bachelor's and master's degrees in business. Students can earn the popular and valuable Master of Business Administration degree with just one additional year of study. This program is available to students of all majors except for Education.

Students will earn both BSBA and MBA degrees within five years of entry as an undergraduate. Undergraduate study in business will satisfy all prerequisite coursework requirements for the MBA program.

#### Program Prerequisites:

Satisfied after completing the undergraduate business core (BIS 220/BIS 221, AC 101/HONB 203, and FIN 214) courses with a "B" average or better and no grade below a "C".

#### Program Application and Admission Requirements:

This program seeks students who have excelled in their undergraduate studies. Applicants must:

1. Earn an overall GPA of 3.0.
2. Complete the College of Business Graduate Studies application, and essays for the MBA program. All application materials should be submitted to the Admissions Office.
3. Forward scores for the Graduate Management Admission Test (GMAT) to the Admissions Office. Students should seek to score 500 or higher on the GMAT. Students may also apply for a GMAT waiver based on a cumulative GPA of 3.3 or higher at the time of graduation.

Applicants may take up to two graduate courses in the fall term of their senior year. A third graduate course may be taken during the senior year after a student has been admitted.

#### Senior Year - Undergraduate program

##### Fall Semester

- Up to 12 credits of undergraduate coursework\*
- Three-six credits of graduate coursework

##### Spring Semester

- Up to 12 credits of undergraduate coursework\*
- Three-six (not to exceed 9 credits total in senior year) credits of graduate coursework

## Degree Requirements

See MBA Program structure (p. 328) (Note: Some MBA courses may have undergraduate prerequisites).

\*Business students must complete all requirements for the BSBA degree independent of the graduate coursework completed during their senior year. This may require students to take courses during summers or winter session to accelerate undergraduate studies.

## Five-year Bachelor/MBA Program – Early Acceptance

Students who have achieved a high level of success in their high school academic performance may apply for conditional early acceptance into either program as freshmen. To qualify for this opportunity, applicants typically have earned a high school GPA of 3.5 or higher, and a combined verbal and quantitative sections score of 1200 or higher on the SAT.

Once admitted, students must

1. Maintain an overall GPA of 3.3 or higher, after freshman year.
2. Successfully complete an undergraduate degree
3. Earn a “B” average or better with no grade below a “C” in the prerequisite courses.

A detailed program of study can be found in the MBA Program structure (p. 328)

### *Senior Year - Undergraduate program*

#### *Fall Semester*

Up to 12 credits of undergraduate coursework\*  
3-6 credits of graduate coursework

#### *Spring Semester*

Up to 12 credits of undergraduate coursework\*  
3-6 (not to exceed 9 credits total in senior year) credits of graduate coursework

## Degree Requirements

See MBA Program structure (p. 328) (Note: Some MBA courses may have undergraduate prerequisites).

\*Business students must complete all requirements for the BSBA degree independent of the graduate coursework completed during their senior year. This may require students to take courses during summers or winter session to accelerate undergraduate studies. Students may be enrolled in a maximum of 17 credits at any point in time.

## Five-Year Bachelor/MS in Sport Leadership and Coaching Program

### Purpose

This program allows undergraduate majors in the College of Business to accelerate the completion of both their bachelors and Masters of Science in Sport Leadership and Coaching. Students will earn both their BSBA and MS in Sport Leadership and Coaching degrees within five years of entry as an undergraduate. With this option, students can complete the MS in Sport Leadership and Coaching with just twelve months of additional study.

### Program Prerequisites:

No specific course prerequisites.

### Program Application and Admission Requirements:

This program seeks students who have excelled in their undergraduate studies.

### Applicants must:

1. Earn an overall GPA of 3.0.
2. Complete the College of Business Graduate Studies application and essays for the MS in Sport Leadership and Coaching program. All application materials should be submitted to the Admissions Office.
3. Forward scores for the Graduate Management Admission Test (GMAT) to the Admissions Office. Students may also apply for a GMAT waiver based on a cumulative GPA of 3.3 or higher at the time of graduation.

Applicants may take up to two graduate courses in their senior year. A third graduate course may be taken during the senior year after a student has been admitted.

A detailed program of study can be found in the MS in Sport Leadership and Coaching Program (p. 333) structure.

## Degree Requirements - Senior Year Undergraduate

### Senior Year - Fall Semester

Up to 12 credits of undergraduate coursework\*  
Three-six credits of graduate coursework.

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**Subtotal: 15-18**

### Senior Year - Spring Semester

Up to 12 credits of undergraduate coursework\*  
Three-six (not to exceed 9 credits total in senior year) credits of graduate coursework.

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**Subtotal: 15-18**

\*Business students must complete all requirements for the BSBA degree independent of the graduate coursework completed during their senior year. This may require students to take courses during summers or winter session to accelerate undergraduate studies. Students may be enrolled in a maximum of 18 credits at any point in time.



## Five-Year Bachelor/MS in Sport Leadership and Coaching Program - Early Acceptance

### Purpose

This program allows undergraduate majors in the College of Business to accelerate the completion of both their bachelor's degree and Master of Science in Sport Leadership and Coaching. Students will earn both their BSBA and MS in Sport Leadership and Coaching degrees within five years of entry as an undergraduate. With this option, students can complete the MS in Sport Leadership and Coaching with just twelve months of additional study.

Students who have achieved a high level of success in their high school academic performance may apply for conditional early acceptance into either program as freshmen. To qualify for this opportunity, applicants typically have earned a high school GPA of 3.5 or higher, and a combined verbal and quantitative sections score of 1200 or higher on the SAT.

Once admitted, students must

1. Maintain an overall GPA of 3.3 or higher, after freshman year.
2. Successfully complete an undergraduate degree.
3. Earn a "B" average or better with no grade below a "C" in the prerequisite courses.

A detailed program of study can be found in the MS in Sport Leadership and Coaching Program (p. 333) structure.

### Degree Requirements - Senior Year Undergraduate

#### Senior Year - Fall Semester

Up to 12 credits of undergraduate coursework\*  
Three-six credits of graduate coursework.

**Subtotal: 15-18**

#### Senior Year - Spring Semester

Up to 12 credits of undergraduate coursework\*  
Three-six (not to exceed 9 credits total in senior year) credits of graduate coursework.

**Subtotal: 15-18**

\*Business students must complete all requirements for the BSBA degree independent of the graduate coursework completed during their senior year. This may require students to take courses during summers or winter session to accelerate undergraduate studies. Students may be enrolled in a maximum of 18 credits at any point in time.

### Five-year Bachelor/Master of Science in Accounting

This program allows undergraduate full time accounting majors in the College of Business to accelerate the completion of both the bachelor's and master's degrees in Accounting. Students can earn the Master of Science in Accounting degree within five years of entry as an undergraduate. A detailed program of study for the MS in Accounting can be found at Master of Science in Accounting Program. (p. 330)

#### Program Prerequisites:

Students must have completed undergraduate prerequisites for

AC6XX or FIN6XX when taking these courses as an undergraduate. A typical student will have an average GPA of 3.0 (B) in their accounting and finance prerequisites with no grade lower than "C."

1. Earn an overall GPA of 3.0.
2. Complete the College of Business Graduate Studies application and essays, for the MS in Accounting program. All application materials should be submitted to the Admissions Office.
3. Forward scores for the Graduate Management Admission Test (GMAT) to the Admissions Office. Students should seek to score 500 or higher on the GMAT. Students may also apply for a GMAT waiver based on a cumulative GPA of 3.3 or higher at the time of graduation.  
Applicants may take up to two graduate courses for which they have met the prerequisites and a third graduate course after they have been admitted to the program.

### Five-year Bachelor/Master of Science in Accounting Program – Early Acceptance

Students who have achieved a high level of success in their high school academic performance may apply for conditional early acceptance into either program as freshmen. To qualify for this opportunity, applicants typically have earned a high school GPA of 3.5 or higher, or a combined verbal and quantitative sections score of 1200 or higher on the SAT. Juniors with a GPA of 3.3 may apply.

Once admitted, students must

1. Maintain an overall GPA of 3.3 or higher, after freshman year.
2. Successfully complete an undergraduate degree
3. Earn a "B" average or better with no grade below a "C" in the prerequisite courses.

This program allows undergraduate full time accounting majors in the College of Business to accelerate the completion of both the bachelor's and master's degrees in Accounting. Students can earn the Master of Science in Accounting degree within five years of entry as an undergraduate. A detailed program of study for the MS. in Accounting can be found at Master of Science in Accounting Program. (p. 330)

### Five-year Bachelor/MS in Organizational Leadership Program

This program allows undergraduate majors in the College of Business to accelerate the completion of both their bachelor's degree and Master of Science in Organizational Leadership. Students will earn both their BSBA and MS in Organizational Leadership degrees within five years of entry as an undergraduate. With this option, students can complete the MS in Organizational Leadership with just seven months of additional study.

#### Program Prerequisites:

No specific course prerequisites.

#### Program Application and Admission Requirements:

This program seeks students who have excelled in their undergraduate studies. Applicants must:

1. Earn an overall GPA of 3.0.

- Complete the College of Business Graduate Studies application and essays for the MS in Organizational Leadership program. All application materials should be submitted to the Admissions Office.
- Forward scores for the Graduate Management Admission Test (GMAT) to the Admissions Office. Students may also apply for a GMAT waiver based on a cumulative GPA of 3.3 or higher at the time of graduation.

Applicants may take up to two graduate courses in their senior year. A third graduate course may be taken during the senior year after a student has been admitted.

## Degree Requirements

See MS in Organizational Leadership Program (p. 332) structure

### Senior Year - Undergraduate program

#### Fall Semester

- Up to 12 credits of undergraduate coursework\*
- 3-6 credits of graduate coursework

#### Spring Semester

- Up to 12 credits of undergraduate coursework\*
- 3-6 (not to exceed 9 total in senior year) credits of graduate coursework

*\*Students must complete all requirements for the BSBA degree independent of the graduate coursework completed during their senior year. This means that additional credits beyond a normal load must be earned prior to the beginning of the senior year. Students may be enrolled in a maximum of 17 credits at any point in time.*

## Graduate Programs in College of Engineering

The Master of Science programs provide opportunities for coursework in Civil Engineering, Electrical Engineering, Engineering Management, Industrial Engineering, Mechanical Engineering, and Business. At the graduate level, programs of study become less structured. Although it is possible to earn a degree strictly on the basis of coursework alone, students with research interests may undertake a three credit hour project or a six credit hour thesis project.

### Master's Advisor

The progress of each student toward the master's degree is guided and directed by a master's advisor, who is a College of Engineering faculty member nominated by the student and approved by the Assistant Dean of the College of Engineering. Incoming students seeking the degree are urged to discuss their proposed concentration area of interest with faculty members in that area with a view toward selecting an advisor later in the semester.

### Degree Requirements

The Master of Science (MS) in Engineering Management and the Master of Science in Engineering (MSE) programs require a minimum of 30 credit hours of graduate courses with a "B" (3.0) or better average. A minimum of five courses must be at the 600 level.

### Course Selection

In addition to the required four core courses (12 credit hours), a student may select any graduate level course for which they have the

appropriate course prerequisites. The course selection must be approved by the assistant dean of engineering and/or the student's master's advisor.

### Thesis Option—Minimum Curriculum Requirements

The curriculum for the Master of Science programs (MSE) thesis option requires a minimum of 24 credit hours of graduate coursework and six hours of thesis. The student is admitted to candidacy after satisfactory completion of six hours of graduate coursework with a "B" average or better and after selecting an approved thesis topic. Upon completion of the thesis, a final oral defense of it is required.

### Non-thesis Option—Minimum Curriculum Requirements

The curriculum for the Master of Science program (MSE) non-thesis option requires a minimum of 30 credit hours of graduate coursework. Students are admitted to candidacy as soon as possible after satisfactory completion of 6 hours of graduate coursework, maintaining a "B" average or better. The MSE in Electrical Engineering requires a comprehensive exam.

### Project Option—Minimum Curriculum Requirements

The curriculum for the Master of Science in Engineering (MSE) project option requires a minimum of 27 credit hours of graduate coursework and 3 hours of project. Students are admitted to candidacy as soon as possible after satisfactory completion of 6 hours of graduate coursework, maintaining a "B" average or better. A 3 credit hour project is required. Upon completion of the project, a final oral presentation of it is required.

## Master of Science in Engineering in Civil Engineering

The Master of Science in Civil Engineering is a program for civil engineering students wishing to study advanced civil engineering topics beyond the bachelor's level. A student can select from three possible options, from an all-coursework option to a research oriented thesis option, to complete the program.

## Degree Requirements

### Core course requirements

CEE 602	Finite Element and Numerical Analysis	3 cr.
CEE 606	Advanced Green and Sustainable Civil Engineering	3 cr.
	or	
CEE 640	Solid Mechanics	3 cr.
CEE 670	Construction Management	3 cr.
EMGT 643/IE 643	Design of Experiments	3 cr.
EMGT 605	Engineering Management	3 cr.
	or	
EMGT 648	Project Management	3 cr.

**Subtotal: 15**

### All Course Option

Combination of 15 credits of following coursework:

CEE 5XX/6XX	500-level/600-level CEE elective	9 cr.
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	course	max.
6XX	EE course	3 cr.
	or	
6XX	EMGT course	3 cr.
	or	
6XX	ME course	3 cr.
<b>Subtotal: 15</b>		

**Project Option**

Project with presentation (CEE 680, 3 credits), plus combination of 12 credits of following coursework:

CEE 5XX/6XX	500-level/600-level CEE elective course	9 cr. max.
6XX	EE course	3 cr.
	or	
6XX	EMGT course	3 cr.
	or	
6XX	ME course	3 cr.
<b>Subtotal: 12</b>		

**Thesis Option**

Thesis with presentation (CEE 698/CEE 699, 6 credits total), plus combination of 9 credits of following coursework:

CEE 5XX/6XX	500-level/600-level CEE elective course	9 cr. max.
6XX	EE course	3 cr.
	or	
6XX	EMGT course	3 cr.
	or	
6XX	ME course	3 cr.
<b>Subtotal: 9</b>		

Note: Up to 6 credit hours may be transferred from another school, subject to approval from the CEE Department.

**Civil Engineering Elective Courses**

CEE 620	Subsurface Contaminant Fate and Transport and Remediation	3 cr.
CEE 630	Advanced Geotechnical Engineering	3 cr.
CEE 642	Advanced Reinforced Concrete Design	3 cr.
CEE 644	Structural Dynamics and Earthquake Engineering	3 cr.
CEE 650	Advanced Railway Engineering and Planning	3 cr.
CEE 680	Civil Engineering Project	3 cr.
CEE 698	Thesis Research	3 cr.

CEE 699 Thesis Research 3 cr.

**Approved Engineering Elective Courses**

EE 601 Advanced Electrical Engineering Analysis 3 cr.

CEE 609/EMGT 609/IE 609 Engineering Cost Analysis 3 cr.

or

EMGT 609/CEE 609/IE 609 Strategic Engineering Economics 3 cr.

CEE 641 Energy Management 3 cr.

or

EMGT 640/CEE 641 Energy Management 3 cr.

ME 610 Measurement Systems 3 cr.

ME 619 Experimental and Analytical Stress Analysis 3 cr.

ME 626 Advanced Fluid Mechanics I 3 cr.

ME 635 Design of Alternative Energy Systems 3 cr.

ME 651 Applied Computational Fluid Dynamics 3 cr.

**Five-Year BSE/MSE in Civil Engineering Program**

This program allows undergraduate civil engineering majors in the College of Engineering to accelerate the completion of the Bachelor of Science in Engineering (BSE) degree in Civil Engineering and to earn the Master of Science in Engineering (MSE) degree in Civil Engineering with just one additional year of study.

**Master of Science in Construction Management****Overview**

Construction Management is defined as a professional service that uses specialized project management techniques to oversee the planning, design, and construction of a project, from its beginning to its end. A Construction Manager provides a project's owner(s) with effective management of the project's schedule, cost, quality, safety, scope, and function.

**MS in Construction Management Admissions Requirements**

- Possession of an undergraduate degree in construction management, civil engineering, architecture, industrial engineering, mechanical engineering, or other related disciplines
- A minimum GPA of 3.0, on a 4.0 scale, in the last 60 hours of undergraduate courses and in all graduate courses (students with a lower GPA may be considered only for probationary or non-degree admission)
- Programming competence
- Students with undergraduate degree from a program not accredited by ABET are encouraged to submit GRE score

**Degree Requirements****MS in Construction Management Degree Requirements**

A total of 30 credits is required for graduation.

Students must select an advisor and have a plan of study approved before completing 12 credits. At least 6 courses in a plan of study must be 600 or higher level.

Core course requirements (21 credits)

CEE 670	Construction Management	3 cr.
CEE 672	Material Selection, Cost Estimation, and Bidding	3 cr.
CEE 609/EMGT 609/IE 609	Engineering Cost Analysis	3 cr.
EMGT 627	Legal and Ethical Issues of Engineering	3 cr.
EMGT 522	Occupational Safety and Health	3 cr.
CEE 606	Advanced Green and Sustainable Civil Engineering	3 cr.
	or	
CEE 641	Energy Management	3 cr.
EMGT 648	Project Management	3 cr.
	or	
EMGT 602	Engineering Crisis, Disaster, and Risk Management	3 cr.

**Subtotal: 21**

All Course Option (30 credits program total)

Combination of nine (9) credits of following coursework:

CEE 5XX/6XX	500-level/600-level CEE elective course	9 cr. max.
	and	
	or	
	EMGT 5XX or EMGT 6XX (9)	9 cr.
	or	
xxx	Technical Elective Graduate (6)	6 cr.

**Subtotal: 9**

Project Option (30 credits program total)

Project with presentation (3 credits)

Combination of six (6) credits of following coursework:

CEE 5XX/6XX	500-level/600-level CEE elective course (6)	6 cr. max.
	and	
	or	
	EMGT 5XX or EMGT 6XX (6)	6 cr.
	or	
xxx	Technical Elective Graduate (6)	6 cr.

**Subtotal: 9**

Thesis Option (30 credits program total)

Thesis with presentation six (6) credits

Three (3) credits of coursework from the following:

CEE 5XX/6XX	500-level/600-level CEE elective course (3)	3 cr. max.
	or	
	EMGT 5XX or EMGT 6XX (3)	3 cr.
	or	
xxx	Technical Elective Graduate (3)	3 cr.

**Subtotal: 9**

\*\*Technical Electives: any departmental course with graduate credit and, with advisor's permission, from a discipline within or outside of the College of Engineering.

Up to six credit hours may be transferred from another school, subject to approval by the CEE Department.

Completion with at least 3.0 GPA, the minimum required graduate credit hours:

\* *Thesis Option* with a minimum of 24 credit hours of coursework plus 6 hours of thesis

\* *Directed Project Option* with a minimum of 27 credit hours of coursework plus 3 credit hours of directed project

Master of Science in Engineering in Electrical Engineering

Degree Requirements

Core course requirements

EMGT 605	Engineering Management	3 cr.
	or	
EMGT 648	Project Management	3 cr.
EE 601	Advanced Electrical Engineering Analysis	3 cr.
EMGT 643/IE 643	Design of Experiments	3 cr.
EMGT 650/IE 650	Systems Integration	3 cr.

**Subtotal: 12**

Non-Thesis Option—Minimum Curriculum Requirements

5XX	EE or CPE course	6 cr. max.
6XX	EE or CPE course	6 cr.

**Subtotal: 18**

Thesis Option—Minimum Curriculum Requirements

6XX	EE or CPE course	6 cr.
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5XX	EE or CPE course	3 cr. max.
XXX	Thesis	6 cr.
<b>Subtotal: 18</b>		

Project Option—Minimum Curriculum Requirements

6XX	EE or CPE course	6 cr.
5XX	EE or CPE course	3 cr. max.
EE 685	Electrical Engineering Project	3 cr.
<b>Subtotal: 18</b>		

\*Courses numbered at the “6xx” level are for graduate students only and are offered on an 11 week term.

Courses numbered at the “5xx” level are provided for entry level graduate students who may require a stronger foundation in a subject area before proceeding to 600 level courses. Course registration in 500 level courses must be approved by the master candidate’s advisor.

Students may tailor their curriculum to meet their career goals. Students are required to meet with their advisor to develop an academic plan of study.

### Master of Science in Engineering in Electrical Engineering-Mechatronics Concentration

The Mechatronics concentration in EE is directed toward both full-time and part-time students with a special emphasis on providing advanced training, experience in performing independent research on topics with theoretical as well as applied interest, and managing projects. A combination of courses from Electrical Engineering, Mechanical Engineering, and Engineering Management, is offered to provide the graduates with a systems perspective.

### Degree Requirements

Core Course Requirements (for a total of 24 credits)

EMGT 605	Engineering Management	3 cr.
	or	
EMGT 648	Project Management	3 cr.
EMGT 607	Quality Engineering	3 cr.
EMGT 643/IE 643	Design of Experiments	3 cr.
EMGT 650/IE 650	Systems Integration	3 cr.
EE 675	Advanced Motion Controls	3 cr.
EE 676	AI: Applied Fuzzy Logic	3 cr.
ME 655	Design of Mechatronic Systems	3 cr.
ME 656/ME 455	Advanced Mechatronics	3 cr.

Select two of the following EE courses (6 cr)

EE 675	Advanced Motion Controls	3 cr.
	or	
EE 676	AI: Applied Fuzzy Logic	3 cr.

	or	
EE 677	Advanced Continuous and Discrete Systems Analysis and Controls	3 cr.
	or	
EE 678	Linear and NonLinear Systems Modeling and Simulation	3 cr.
ME 655	Design of Mechatronic Systems	3 cr.
ME 656/ME 455	Advanced Mechatronics	3 cr.

**Subtotal: 24**

### Electrical Engineering Elective Courses

EE 601	Advanced Electrical Engineering Analysis	3 cr.
EE 614	Advanced Electromagnetics	3 cr.
EE 615	Antenna Theory and Design	3 cr.
EE 616	Introduction to Numerical Electromagnetics	3 cr.
EE 621	Coherent Optics	3 cr.
EE 625	Stochastic Processes - Kalman Filters	3 cr.
EE 650	Advanced Digital Signal Processing	3 cr.
EE 667	Advanced Electrical Materials	3 cr.
EE 670	AI: Applied Neural Networks and Machine Learning	3 cr.
EE 685	Electrical Engineering Project	3 cr.
EE 690	Special Topics in Electrical Engineering	3 cr.
EE 698-699	Thesis Research	6 cr.

### Computer Engineering Elective Courses

CPE 620	Advanced Computer Architecture	3 cr.
CPE 625	Advanced Software Engineering	3 cr.
CPE 635	Advanced Requirements Analysis	3 cr.
CPE 645	Embedded Software Systems	3 cr.
CPE 648	Software Project Management	3 cr.
CPE 650	Software Architecture	3 cr.
CPE 652	Software Generation and Maintenance	3 cr.
CPE 655	Computer Network Architecture	3 cr.
CPE 690	Special Topics in Computer Engineering	3 cr.

### Core Requirements

The following three options are available for the remaining six credits

- All Course Option:
  - EE 601 Advanced Electrical Engineering and one EE 500/600 level course from an approved list of courses

- Project Option:
  - EE 685 Project with presentation (3 credits) and EE 601
- Thesis Option:
  - EE 698-EE 699 six credits of thesis with presentation

*Note: For students who wish to select a project/thesis topic sponsored by their employer, the topic must be approved by the student's supervisor as well as their faculty advisor.*

## Master of Science in Engineering in Mechanical Engineering

### Degree Requirements

#### Core course requirements

EMGT 605	Engineering Management	3 cr.
	or	
EMGT 648	Project Management	3 cr.
6XX	ME course	3 cr.
EMGT 643/IE 643	Design of Experiments	3 cr.
EMGT 650/IE 650	Systems Integration	3 cr.
		<b>Subtotal: 12</b>

#### Non-Thesis Option—Minimum Curriculum Requirements

6XX	ME course	3 cr.
5XX	ME course	3 cr. max.
		<b>Subtotal: 18</b>

#### Thesis Option—Minimum Curriculum Requirements

6XX	ME course	3 cr.
5XX	ME course	3 cr. max.
XXX	Thesis	6 cr.
		<b>Subtotal: 18</b>

#### Project Option—Minimum Curriculum Requirements

6XX	ME course	3 cr.
5XX	ME course	3 cr. max.
ME 685	Mechanical Engineering Project	3 cr.
		<b>Subtotal: 18</b>

\*Graduate ME courses can be selected in such a way to expand a student's technical knowledge in keeping with their interest and professional needs. Students are required to meet with their advisor to develop a plan of study.

## Master of Science in Engineering in Mechanical Engineering - Acoustic Processing and Gene Therapy Concentration

The Acoustic Processing for Cell and Gene Therapy concentration in ME is directed toward both full-time and part-time students with a special emphasis on providing advanced training and experience in

performing independent research on topics with theoretical as well as applied interest in acoustics. A combination of courses from Mechanical Engineering and the acoustics concentration will be offered to provide the graduates with an Acoustic Processing for Cell and Gene Therapy perspective.

### Degree Requirements

#### Core Course Requirements (for a total of 15 credits)

EMGT 643/IE 643	Design of Experiments	3 cr.
ME 626	Advanced Fluid Mechanics I	3 cr.
ME 631	Piezo-electricity and Transducers	3 cr.
ME 660	Acoustics I	3 cr.
ME 674	Acoustics and Bioprocessing Instrumentation and Measurement	3 cr.

**Subtotal: 15**

The following three options are available for six credits:

#### All Course Option

Two ME 500/600 level courses from an approved list of courses.

#### Project Option

Project with presentation (3 credits) and one ME 500/600 level course from an approved list of courses.

#### Thesis Option

Six credits of thesis with presentation.

*Note: For students who wish to select a project/thesis topic sponsored by their employer, the topic must be approved by the student's supervisor as well as their faculty advisor.*

**Subtotal: 6**

#### Suggested Concentration Electives

ME 642	Numerical Simulation of Acoustics and Fluid Dynamics	3 cr.
ME 661	Acoustics II	3 cr.
ME 663	Bioprocessing	3 cr.

#### Mechanical Engineering Electives

ME 610	Measurement Systems	3 cr.
ME 619	Experimental and Analytical Stress Analysis	3 cr.
ME 620	Applied Mechanical Design	3 cr.
ME 632	Fundamentals of Flight	3 cr.
ME 635	Design of Alternative Energy Systems	3 cr.

ME 640	Materials Selection for Engineering Design and Manufacturing	3 cr.
ME 651	Applied Computational Fluid Dynamics	3 cr.
ME 654	Computer Control of Manufacturing	3 cr.
ME 656/ME 455	Advanced Mechatronics	3 cr.
ME 685	Mechanical Engineering Project	3 cr.
ME 690 - 694	Special Topics in Mechanical Engineering	3 cr.

**Subtotal: 9**

Up to six hours may be transferred from another accredited graduate school.

Completion with at least 3.00 GPA

Subtotal: 30

### Master of Science in Engineering in Mechanical Engineering - Mechatronics Concentration

The Mechatronics concentration in ME is directed toward both full-time and part-time students with a special emphasis on providing advanced training, experience in performing independent research on topics with theoretical as well as applied interest, and managing projects. A combination of courses from Electrical Engineering, Mechanical Engineering, and Engineering Management is offered to provide the graduates with a systems perspective.

#### Degree Requirements

Core Course Requirements (for a total of 24 credits)

EMGT 605	Engineering Management	3 cr.
	or	
EMGT 648	Project Management	3 cr.
6XX	ME course	3 cr.
EMGT 643/IE 643	Design of Experiments	3 cr.
EMGT 650/IE 650	Systems Integration	3 cr.
Select two of the following EE courses (6 cr)		
EE 675	Advanced Motion Controls	3 cr.
	or	
EE 676	AI: Applied Fuzzy Logic	3 cr.
	or	
EE 677	Advanced Continuous and Discrete Systems Analysis and Controls	3 cr.
	or	
EE 678	Linear and NonLinear Systems Modeling and Simulation	3 cr.
ME 655	Design of Mechatronic Systems	3 cr.

ME 656/ME 455	Advanced Mechatronics	3 cr.
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**Subtotal: 24**

The following three options are available for the remaining six credits

All Course Option:

Two ME 500/600 level courses from an approved list of courses.

Project Option

Project with presentation (3 credits) and one ME 500/600 level course from an approved list of courses.

Thesis Option

Six credits of thesis with presentation.

Note: For students who wish to select a project/thesis topic sponsored by their employer, the topic must be approved by the student's supervisor as well as their faculty advisor.

#### Mechanical Engineering Elective Courses

ME 610	Measurement Systems	3 cr.
ME 619	Experimental and Analytical Stress Analysis	3 cr.
ME 620	Applied Mechanical Design	3 cr.
ME 626	Advanced Fluid Mechanics I	3 cr.
ME 632	Fundamentals of Flight	3 cr.
ME 635	Design of Alternative Energy Systems	3 cr.
ME 640	Materials Selection for Engineering Design and Manufacturing	3 cr.
ME 651	Applied Computational Fluid Dynamics	3 cr.
ME 654	Computer Control of Manufacturing	3 cr.
ME 656/ME 455	Advanced Mechatronics	3 cr.
ME 685	Mechanical Engineering Project	3 cr.
ME 690 - 694	Special Topics in Mechanical Engineering	3 cr.
ME 698	Thesis Research	3 cr.

### Master of Science in Engineering Management

Nearly half of the engineers working in industry serve in management capacities, yet many undergraduate engineering curricula do not include information on the development of management problem-solving skills. The Master of Science in Engineering Management program addresses this need by including core courses in project management; supply chain management; and logistics, quality engineering, and statistical methods for quality assurance.

#### Program Objectives

Graduates of the program will:

- be able to plan, design, and manage technological projects;

- have increased career advancement opportunities given their coursework and experience in the program; and
- be better prepared to manage and implement change within their organization.

## Degree Requirements

### Core Courses

EMGT 607	Quality Engineering	3 cr.
EMGT 615	Statistical Quality Control	3 cr.
EMGT 619/IE 619	Engineering Supply Chain	3 cr.
EMGT 648	Project Management	3 cr.
	or	
EMGT 605	Engineering Management	3 cr.

In addition to the required four core courses (12 credit hours) above, students can expand their technical knowledge in keeping with their interest and professional needs by selecting any graduate level course in engineering management. A student may also select a maximum of three graduate courses from the Master of Business Administration (MBA) program.

### Production and Manufacturing Systems courses

EMGT 609/CEE 609/IE 609	Strategic Engineering Economics	3 cr.
EMGT 622/IE 622	Lean Production Systems	3 cr.
EMGT 629/IE 629	Advanced Manufacturing Engineering Systems	3 cr.
EMGT 631/IE 631	Production and Inventory Modeling	3 cr.
EMGT 637	Ergonomics and Occupational Safety	3 cr.
EMGT 640/CEE 641	Energy Management	3 cr.
EMGT 642	Engineering Materials	3 cr.
EMGT 643/IE 643	Design of Experiments	3 cr.
EMGT 645/IE 645	Quantitative Models of Supply Chain Management	3 cr.
EMGT 647	Facility Planning	3 cr.

### Quality Engineering courses

EMGT 602	Engineering Crisis, Disaster, and Risk Management	3 cr.
EMGT 609/CEE 609/IE 609	Strategic Engineering Economics	3 cr.
EMGT 643/IE 643	Design of Experiments	3 cr.
EMGT 644/IE 644	Quality Systems and Process Improvement	3 cr.

### Business and Engineering Information Systems courses

BIS 610	Information Technology	3 cr.
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	Management and Applications	
BIS 6XX	Business Information System Elective	3 cr.
CPE 6XX	Computer Engineering Elective	3 cr.
EMGT 602	Engineering Crisis, Disaster, and Risk Management	3 cr.
EMGT 611	Strategic Direction of Technology and Innovation	3 cr.
EMGT 620/IE 620	Multi-Criteria Decision Analysis	3 cr.
EMGT 624	Engineering Management Information Systems	3 cr.
EMGT 626/IE 626	Discrete Event Simulation	3 cr.
EMGT 635/IE 635	Operations Research	3 cr.
EMGT 650/IE 650	Systems Integration	3 cr.

### Electives

Engineering Management Electives—9 credit hours minimum\*

Engineering or Business Electives—9 credit hours maximum

30 credits total program

## Five-Year Bachelor/Master of Science in Engineering Management Program

This program allows undergraduate Engineering majors in the College of Engineering to accelerate the completion of the bachelor's degree and to earn the Master of Science in Engineering Management degree with just one additional year of study.

## Master of Science in Engineering in Industrial Engineering

Industrial engineers play key roles and are at the forefront of designing effective and efficient systems for quality products and services. The Master of Science in Engineering in Industrial Engineering is intended for students with undergraduate Engineering degrees to further advance their knowledge in areas such as analytical modeling, production planning, facilities design, and scheduling.

### Program Objectives

Graduates of the program will:

- have the ability to synthesize, analyze, and optimize data for enterprise decision making
- model, improve, control, and re-design enterprise data
- be prepared to apply new tools and technique to solve industrial engineering problems

## Degree Requirements

### Core Courses - 9 credit hours

IE 601	Advanced Engineering Statistics	3 cr.
IE 631/EMGT	Production and Inventory	3 cr.



631	Modeling	
IE 635/EMGT 635	Operations Research	3 cr.

**Subtotal: 9****Core Concentration - 3 credit hours**

IE 626/EMGT 626	Discrete Event Simulation	3 cr.
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or

IE 629/EMGT 629	Advanced Manufacturing Engineering Systems	3 cr.
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or

IE 643/EMGT 643	Design of Experiments	3 cr.
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**Subtotal: 3**

In addition to the required four core courses & concentration (12 credit hours) above, students can expand their technical knowledge in keeping with their interest and professional needs. Students can select from a thesis or non-thesis option. The thesis option requires 12 credit hours of electives plus 6 credit hours of thesis (IE 698 and IE 699). The non-thesis option requires 15 credit hours of electives and 3 credit hours of a research project (IE 680). The coursework option requires 18 credit hours of electives.

**Approved Electives**

15 credits for non-thesis option, 12 credits for thesis option

IE 604	Human Factors	3 cr.
IE 605	Reliability	3 cr.
IE 609/CEE 609/EMGT 609	Strategic Engineering Economics	3 cr.
IE 619/EMGT 619	Engineering Supply Chain	3 cr.
IE 620/EMGT 620	Multi-Criteria Decision Analysis	3 cr.
IE 622/EMGT 622	Lean Production Systems	3 cr.
IE 635/EMGT 635	Operations Research	3 cr.
IE 644/EMGT 644	Quality Systems and Process Improvement	3 cr.
IE 645/EMGT 645	Quantitative Models of Supply Chain Management	3 cr.

**Subtotal: 12-15**

Note: For students who wish to select a project/thesis topic sponsored by their employer, the topic must be approved by the student's supervisor, as well as their faculty advisor.

Subtotal: 24-27

## Master of Science in Engineering Management/Master of Business Administration (MS/MBA)

The Colleges of Business and Engineering offer a joint MS/MBA for those in the engineering profession who want to advance their knowledge and improve their management career opportunities in engineering and technology-oriented companies. By pursuing the combined degree program, students earn the MS/MBA in 54 credits, taking advantage of 12 credits that can be applied to both degrees.

Candidates for the program must have a four-year undergraduate degree in engineering or a closely related field from an accredited college or university. Those interested in this degree option should contact the Admissions Office for specific information about the program and the application process.

Total Credit Hours: 54

## Doctoral Program in Engineering Management

**General Information**

The Doctor of Philosophy (PhD) focuses on developing skills needed to conduct rigorous research in areas related to the improvement, design, and management of projects and programs within complex human-technological systems. These systems include engineering systems, healthcare systems, service systems, and logistical/transportation systems. Through a combination of coursework and directed research, the Department of Industrial Engineering and Engineering Management will provide a solid foundation and depth of engineering management theory and practice, provide breadth and depth across multiple types of human technological systems, and contribute to the body and knowledge in engineering management.

**Program Goals and Objectives**

The goal of this program is to prepare graduates with appropriate technical depth and breadth of knowledge so that they may be successful educators, researchers, and practitioners in the management of engineering and technology. Graduates of this program will demonstrate:

A solid foundation and depth in engineering and management theory and practice;

A breadth across multiple types of human technological systems; and

An ability to contribute to the body of knowledge in engineering management.

These objectives will be assessed via coursework in related areas, class projects, dissertation completion, and publication of research work.

**Program Structure**

The following outlines the degree and curricular requirements for the program. In addition to the required coursework each student must complete a preliminary examination, a comprehensive examination, a proposal defense, and finally a dissertation defense in order to obtain the degree. Students must maintain a grade point average of 3.0 on a 4.0 scale. Students may also have no more than two course grades of 'C' or lower.

**Credit Hour Requirements**

Graduate Coursework : at least 57 credit hours beyond BS; at least 30 credit hours beyond MS; 60% of the PhD courses (incl. dissertation)

must be at 700 or higher level and 70% of all graduate courses (incl. dissertation) must be at 600 or higher level.

Dissertation : at least 27 credit hours.

### Preliminary Examination

Before completing five terms at Western New England University, a student (full-time) must pass the preliminary examination administered by the department. A student may attempt the examination no more than twice. The examination will be based on the subject material from EMGT 643, EMGT 635, EMGT 648, EMGT 701, and EMGT 704/EMGT 604.

### Advisor, Advisory Committee, and Plan of study

Before completing six terms at Western New England University, a student (full-time) must select a major advisor and an advisory committee: With the assistance of the advisor, the student must prepare a plan of study that must be approved by the advisory committee and department chair before the comprehensive examination is attempted. Advisory committees will consist of at least three departmental members (one of which must be the major advisor) and at least one member from outside the department.

### Dissertation Approval Examination (proposal defense)

Students must prepare a written dissertation research proposal and present it orally. A student must be continuously enrolled in EMGT 770-799 (Dissertation) after the dissertation approval examination.

### Dissertation Defense

Students must successfully defend their dissertation through written and oral presentation. Students must complete this milestone within eight years of initial enrollment into the program.

## Degree Requirements

### Core courses (15-21 hours)

EMGT 635/IE 635	Operations Research	3 cr.
EMGT 643/IE 643	Design of Experiments	3 cr.
EMGT 648	Project Management	3 cr.
EMGT 701	Seminar / Research Methods for Engineering Management	3 cr.
EMGT 704/IE 614	Engineering Risk Analysis Methods	3 cr.
	or	

A student who enters the program and does not have a Master of Science degree in Engineering Management, or a closely related field, will need to complete the following additional courses:

EMGT 619/IE 619	Engineering Supply Chain	3 cr.
EMGT 644/IE 644	Quality Systems and Process Improvement	3 cr.

**Subtotal: 15-21**

### Elective Courses

EMGT 702/IE 612	Risk Assessment	3 cr.
EMGT 706	Enterprise and Complex Systems	3 cr.

for Engineers

EMGT 726	Advanced Modeling and Analysis of Systems	3 cr.
EMGT 735	Optimization Methods II	3 cr.
EMGT 740	Scheduling and Sequencing	3 cr.
EMGT 765	Special Topics in Engineering Management	1-3 cr.

Students may also enroll in no more than two MBA courses to satisfy any remaining course requirements. These courses require the approval of the student's advisory committee.

Dissertation Research (27 - 36 credit hours)

EMGT 770-799	Dissertation Research	1-3 cr.
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**Subtotal: 24-36**

Subtotal: 39-57

## Doctoral Program in Industrial Engineering

### General Information

A PhD in Industrial Engineering is a two-part degree. In the first part, the course work, you will gain advanced knowledge and skills in optimization, system design, quality control, cost analysis, supply chain management and other related topics. Through the second part, the research project, you will advance the body of academic and scientific knowledge through the development of a robust body of research that addresses a cutting edge topic in Industrial Engineering.

### Program Goals and Objectives

The goal of the program is to prepare graduates with the appropriate technical depth and breadth of knowledge so that they may be successful educators, researchers, and practitioners in the analysis and improvement of complex human technological systems. The program will follow three principles in pursuit of this goal. In addition to passing the required coursework, students must also pass a comprehensive examination to demonstrate a mastery of Principles 1 and 2.

#### Principle 1: Provide a Solid Foundation and Depth in Industrial Engineering Theory and Practice

A solid fundamental understanding of a field is essential in order for students to be considered an expert in that field. It is these fundamentals that a student will need to expand upon in order to contribute new knowledge to the field of industrial engineering. We place an emphasis on the fundamentals of the analysis and improvement of complex human technological systems and an emphasis on the modeling and analysis of such systems.

#### Principle 2: Provide Breadth Across Multiple Types of Human Technological Systems

Principles, tools, and fundamentals of industrial engineering have been rooted in engineering and manufacturing systems. These tools have also been successfully applied to other systems such as service and transportation/logistical systems. Today industrial engineers can be increasingly found in banks, hospitals, amusement parks, airlines, and a variety of delivery agencies. On the surface, these industries appear different however; they all involve people, materials, information, equipment, energy, and capital.

#### Principle 3: Contribute to the body of Knowledge in Industrial Engineering

A requirement of any Doctorate of Philosophy Program in

Engineering is the expectation that graduating students will contribute to the body of knowledge in their chosen field by conducting research. This will be demonstrated by graduating students successfully completing a doctoral dissertation. Students conducting dissertation research will be guided by a selected advisor and advisory committee. Students must pass a dissertation approval examination in order to ensure they are prepared to conduct research. Upon the successful completion of research, graduating students will document the research results in a dissertation. Dissertations will be defended in front of advisory committees.

### Program Structure

The following outlines the degree and curricular requirements for the program. In addition to the required coursework each student must complete a preliminary examination, a comprehensive examination, a proposal defense and finally a dissertation defense in order to obtain the degree. Students must maintain a grade point average of 3.5 on a 4.0 scale. Students may also have no more than two course grades of 'C' or lower.

### Credit Hour Requirements

Graduate Coursework: at least 57 credit hours beyond BS; at least 30 credit hours beyond MS; 60% of the PhD courses (incl. dissertation) must be at 700 or higher level and 70% of all graduate courses (incl. dissertation) must be at 600 or higher level, with the exception for 500 level course with Department Chair approval.

Dissertation: at least 27 credit hours.

### Preliminary Examination

Before completing six terms at Western New England University, a student (full-time) must select a major advisor and an advisory committee. With the assistance of the advisor, the student must prepare a plan of study that must be approved by the advisory committee and department chair before the comprehensive examination is attempted. Advisory committees will consist of at least three departmental members (one of which must be the major advisor) and at least one member from outside the department

### Advisor, Advisory Committee, and Plan of Study

Before completing six terms at Western New England University, a student (full-time) must select a major advisor and an advisory committee. With the assistance of the advisor, the student must prepare a plan of study that must be approved by the advisory committee and department chair before the comprehensive examination is attempted. Advisory committees will consist of at least three departmental members (one of which must be the major advisor) and at least one member from outside the department.

### Dissertation Approval Examination (proposal defense)

Students must successfully defend their dissertation through written and oral presentation. Students must complete this milestone within eight years of initial enrollment into the program.

### Dissertation defense

Students must successfully defend their dissertation through written and oral presentation. Students must complete this milestone within eight years of initial enrollment into the program.

### Degree Requirements

Complete the following five core courses:

All students must complete the following five core courses:

IE 601	Advanced Engineering Statistics	3 cr.
IE 629/EMGT 629	Advanced Manufacturing Engineering Systems	3 cr.
IE 631/EMGT 631	Production and Inventory Modeling	3 cr.
IE 635/EMGT 635	Operations Research	3 cr.

**Subtotal: 12**

A student who enters the program and does not have a Master of Science degree in Industrial Engineering, or a closely related field, will need to complete the following additional courses:

IE 619/EMGT 619	Engineering Supply Chain	3 cr.
IE 626/EMGT 626	Discrete Event Simulation	3 cr.
IE 643/EMGT 643	Design of Experiments	3 cr.
IE 644/EMGT 644	Quality Systems and Process Improvement	3 cr.

**Subtotal: 12**

In addition to the requirements above, students must take the remaining required courses from the Industrial Engineering section of the current catalog in consultation with their preliminary and/or dissertation advisor. Courses outside of the IEEM will require the approval of the student's preliminary and/or primary advisor.

### Dissertation Research (27 credit hours)

**Subtotal: 27**

### Curriculum Summary

Total number of courses recommended for the degree 6††

Total credit hours recommended for the degree 54

Prerequisite, Concentration, Dissertation or Other Requirements: Students must take a minimum of 36 credit hours of research of any combination of ME 770-799 (Dissertation Research) and submission of Dissertation required. Additional examinations include Preliminary Examination (qualifying), Comprehensive Examination (covering major area of study), Dissertation Approval Examination (oral examination on dissertation research proposal), and Dissertation Defense (oral).

†† Excludes number of Dissertation courses needed to meet 36 credit hour minimum requirement.

Total Credit Hours: 54

## Doctoral Program in Mechanical Engineering

### General Information

The Doctor of Philosophy (PhD) focuses on developing skills needed to conduct rigorous research in areas that includes Mechatronics and Robotics, Thermo-fluids and Energy, Vibrations and Mechanics, Energy Systems, Novel Materials for energy and environmental applications, and Design and Manufacturing. Through a combination

of coursework and independent research culminating in a dissertation, a student will gain the foundation and depth of mechanical engineering theory and practice, and a breadth of knowledge across multiple areas of specialization.

### Program Goals and Objectives

The PhD program offers students opportunities to develop levels of expertise and knowledge consistent with a career of technical leadership. Additionally, the program emphasizes the acquisition of advanced knowledge and the fostering of individual experience of significant intellectual exploration. One goal of the program is to prepare graduates with appropriate technical depth and breadth of knowledge and experience in order to become researchers and practitioners in the mechanical engineering and technology area.

It is the philosophy of the program to graduate students who have the ability to create, evaluate, improve, design, and manage complex mechanical and technological systems. The systems include:

- solid mechanics
- heat transfer
- thermo-fluids and energy
- materials science
- mechanical design and manufacturing
- mechatronics and robotics

Additionally, students will demonstrate the ability, through dissertation research, to contribute to the body of knowledge in the field of Mechanical Engineering.

### Program Structure

The PhD program is intended to be versatile and tailored to support individual research initiatives. Course requirements are established solely by the doctoral committee. The degree typically consists of 30 or more graduate course credits earned at Western New England University beyond the MS. The PhD in Mechanical Engineering is a thesis-based research-oriented degree for students who intend to pursue careers in Research and Development, Research Management, or Academia.

### Credit Hour Requirements

The requirements for the PhD in Mechanical Engineering are:

1. possession (or nearing the completion) of a master's or bachelor's degree in mechanical engineering, or a closely related discipline. Students seeking admissions to the PhD program will have an undergraduate academic record that demonstrates outstanding performance.
2. a minimum cumulative grade point average of a 3.5 in all graduate work or a minimum undergraduate cumulative grade point average of a 3.5. Tentative acceptance is allowed for candidates having a GPA between 3.0 and 3.5; and
3. a Graduate Record Exam (GRE) score from the last five years with a combined verbal and quantitative score of 300 with a quantitative score in at least the top 40th percentile.
4. candidates whose primary language is not English will be required to demonstrate proficiency in English. Test of English as a Foreign Language (TOEFL) scores at a minimum of 80 or higher on the internet-based test with a 19 or higher in the speaking section. An acceptable alternative to the TOEFL is the International English Language Testing System (IELTS) test, on which a candidate must achieve a minimum composite score of 6.5.

Graduate Coursework : at least 57 credit hours beyond BS; at least 30 credit hours beyond MS; 60% of the PhD courses (incl. dissertation) must be at 700 or higher level and 70% of all graduate courses (incl. dissertation) must be at 600 or higher level.

Dissertation : at least 27 credit hours.

### Preliminary Examination

Before completing five terms at Western New England University, a student (full-time) must pass the preliminary examination administered by the department. A student may attempt the examination no more than twice. The examination will be based on the subject material from EMGT 643, EMGT 635, EMGT 648, EMGT 701, and EMGT 704/EMGT 604.

### Advisor, Advisory Committee and Plan of Study

Before completing six terms at Western New England University, a student (full-time) must select a major advisor and an advisory committee. With the assistance of the advisor, the student must prepare a plan of study that must be approved by the advisory committee and department chair before the comprehensive examination is attempted. Advisory committees will consist of at least three departmental members (one of which must be the major advisor) and at least one member from outside the department.

### Dissertation Approval Examination (proposal defense)

The comprehensive exam should cover the specific areas of mechanical engineering, designated by the PhD advisory committee that relate to the student's area of research and study. The student may attempt this examination no more than twice. This examination will be administered by the student's advisory committee and is intended to ensure that the student has the comprehensive understanding needed to complete the dissertation research effort.

The basis for the comprehensive exam is the final written thesis proposal. The comprehensive exam will consist of an oral examination, administered by the advisory committee. The exam will include a presentation of the final research proposal related to the thesis and plans for completing the work.

### Dissertation defense

- The purpose of this examination is for students to defend their PhD dissertation. Students must defend their dissertation through an oral presentation.
- In the time between successful completion of the Comprehensive Examination and the final oral examination (thesis defense) the following will apply:
  - The final oral exam must be requested and scheduled through the office of the Dean of the College
  - The student must be continuously registered
  - If a period of more than 5 years passes between the successful passing of the Comprehensive exam and the oral defense, the comprehensive exam must be retaken and passed before the final oral examination can be scheduled.
  - The final oral exam is administered by the entire doctoral committee. It is a defense of the doctoral thesis. The final oral exam will be publicized and members of the entire academic community are invited to attend.

Students must complete this milestone within 8 years of initial enrollment into the program.

## Degree Requirements

### Core courses (45 hours)

It is recommended that all students that enter with the M.S. complete the following four core courses:

Major Required (Core) Courses (Total # of courses recommended = 3+ Dissertation credit hours)

ME 610	Measurement Systems	3 cr.
ME 646	Applied Finite Element Analysis	3 cr.
ME 701	Seminar / Research Methods for Mechanical Engineering	3 cr.
ME 770-799	Dissertation Research	1-3 cr.

**Subtotal: 45**

A student who enters the program and does not have a Master of Science degree in Mechanical Engineering, or a closely related field, will need to complete the following additional courses:

ME 610	Measurement Systems	3 cr.
ME 626	Advanced Fluid Mechanics I	3 cr.
ME 646	Applied Finite Element Analysis	3 cr.
ME 656/ME 455	Advanced Mechatronics	3 cr.
ME 701	Seminar / Research Methods for Mechanical Engineering	3 cr.
ME 747	Advanced Manufacturing and Materials Processing	3 cr.
ME 770-799	Dissertation Research	1-3 cr.

**Subtotal: 54**

Students may complete their remaining course requirements by taking any additional Mechanical Engineering graduate level courses or other graduate courses (600 – 700 level) offered by the College of Engineering in consultation with their major advisor.

### Mechatronics and Robotics

Elective Course Choices by Area (Total number of courses required beyond the core = 3)

ME 654	Computer Control of Manufacturing	3 cr.
ME 655	Design of Mechatronic Systems	3 cr.
ME 656/ME 455	Advanced Mechatronics	3 cr.
ME 755	Machine Vision	3 cr.
ME 755	Advanced Robotics	3 cr.
ME 765	Special Topics in Engineering Management	1-3 cr.

**Subtotal: 3**

### Thermofluids and Energy

Elective Course Choices by Area (Total number of courses required beyond the core = 3)

ME 626	Advanced Fluid Mechanics I	3 cr.
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ME 632	Fundamentals of Flight	3 cr.
ME 635	Design of Alternative Energy Systems	3 cr.
ME 726	Design of Heat Exchangers	3 cr.
ME 752	Applied Computational Fluid Dynamics and Numerical Heat Transfer	3 cr.
ME 765	Special Topics in Engineering Management	1-3 cr.
ME 782	Advanced Energy Systems	3 cr.

**Subtotal: 3**

### Vibrations and Mechanics

Elective Course Choices by Area (Total number of courses required beyond the core = 3)

ME 619	Experimental and Analytical Stress Analysis	3 cr.
ME 660	Acoustics I	3 cr.
ME 784	Applied Design and Analysis with Composites	3 cr.
ME 765	Special Topics in Engineering Management	1-3 cr.

**Subtotal: 3**

### Design and Manufacturing

Elective Course Choices by Area (Total number of courses required beyond the core = 3)

ME 620	Applied Mechanical Design	3 cr.
ME 714	Composite Materials Design and Manufacturing	3 cr.
ME 747	Advanced Manufacturing and Materials Processing	3 cr.
ME 765	Special Topics in Engineering Management	1-3 cr.

**Subtotal: 3**

### Elective Courses

Elective Course Choices by Area (Total number of courses required beyond the core = 3)

**Subtotal: 3**

### Dissertation Research (27 - 36 credit hours)

EMGT 770-799	Dissertation Research	1-3 cr.
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**Subtotal: 27-36**

### Curriculum Summary

Total number of courses recommended for the degree 6††

Total credit hours recommended for the degree  
54

Prerequisite, Concentration, Dissertation or Other Requirements: Students must take a minimum of 36 credit hours of research of any combination of ME 770-799 (Dissertation Research) and submission of Dissertation required. Additional examinations include Preliminary Examination (qualifying), Comprehensive Examination (covering major area of study), Dissertation Approval Examination (oral examination on dissertation research proposal), and Dissertation Defense (oral).

†† Excludes number of Dissertation courses needed to meet 36 credit hour minimum requirement.

Total Credit Hours: 54

### Example Program of Study

The following table provides an example schedule (student who enters program already having a MS in EMGT) with which course and program requirements may be completed.

### Degree Requirements

#### Year 1 - Fall

EMGT 701	Seminar / Research Methods for Engineering Management	3 cr.
EMGT 648	Project Management	3 cr.

#### Year 1 - Winter

EMGT 619/IE 619	Engineering Supply Chain	3 cr.
EMGT 626/IE 626	Discrete Event Simulation	3 cr.

#### Year 1 - Spring

EMGT 702/IE 612	Risk Assessment	3 cr.
EMGT 635/IE 635	Operations Research	3 cr.

#### Year 1 - Summer

EMGT 726	Advanced Modeling and Analysis of Systems	3 cr.
EMGT 650/IE 650	Systems Integration	3 cr.

#### Year 2 - Fall

EMGT 609/CEE 609/IE 609	Strategic Engineering Economics	3 cr.
EMGT 770-799	Dissertation Research	1-3 cr.

#### Year 2 - Winter

EMGT 709	Advanced Engineering Cost Estimation	3 cr.
EMGT 770-799	Dissertation Research	1-3 cr.

#### Year 2 - Spring

EMGT 770-799	Dissertation Research	1-3 cr.
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#### Year 2 - Summer

EMGT 770-799	Dissertation Research	1-3 cr.
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#### Year 3 - Fall

EMGT 770-799	Dissertation Research	1-3 cr.
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#### Year 3 - Winter

EMGT 770-799	Dissertation Research	1-3 cr.
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#### Year 3 - Spring

EMGT 770-799	Dissertation Research	1-3 cr.
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#### Year 3 - Summer

EMGT 770-799	Dissertation Research	1-3 cr.
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### Admissions

Candidates interested in this program need to have earned a masters or bachelors degree in engineering, or a closely related discipline. Candidates need to have demonstrated a competence in at least one structured programming language and have evidence of the completion of a course in probability and statistics. Candidates should have a minimum cumulative grade point average of a 3.5 in all graduate work or a minimum undergraduate cumulative grade point average of a 3.5. Candidates must submit their score from the Graduate Records Examination (GRE). The program accepts students who have met these requirements and demonstrate strong potential as scholars and future leaders in the field of engineering management

### Professional Program in School of Law

Interm Dean Beth Cohen

Associate Dean for Academic Affairs Erin Buzuvis

Associate Dean Law Student Affairs Jordan Hall

For nearly a century, Western New England University School of Law has been preparing men and women to enter the legal profession. It is the only Massachusetts law school outside of the Boston area accredited by the American Bar Association. It is also a member of the Association of American Law Schools.

Though its academic programs are rigorous, the learning environment at the School of Law promotes cooperation and interaction at every level. Faculty, staff, and administration are highly accessible and supportive.

The School of Law has more than 8,000 alumni who live and practice in 49 states, several U.S. territories, Canada, and several foreign countries.

For admissions information, contact the School of Law at 413-782-1406 or 800-782-6665 or at <https://www1.wne.edu/law/>

### JD/Master of Science in Sport Leadership and Coaching (dual degree program)

The JD/MS in Sport Leadership and Coaching (JD/MSLC) provides advanced sport management education to individuals seeking managerial and/or athletic coaching positions in sport organizations combined with the completion of a Juris Doctorate. The degree provides students the opportunity to earn a JD and an in-depth understanding of the core concepts necessary to run critical program functional areas like marketing, fundraising, player evaluation, and team leadership. The degree also facilitates the development of analytical abilities required to make sound business decisions; fosters a deeper understanding of leadership theory, organizational

dynamics, and team performance; and the exploration of how individuals can motivate, build, and inspire a high performing team. Pursuing both degrees allows students to take advantage of cross credits, where 6 credits of business coursework can be applied toward the 88 credits required for the JD degree, and, 9 credits of law coursework can be applied toward the 30 credits required for the MS in Sport Leadership and Coaching degree.

The JD/MS in Sport Leadership and Coaching (JD/MSLC) features two one-week residencies, one offered at the beginning of the program, and the other, at the end of the program. Each residency will be facilitated by a series of graduate courses that will be offered online, with some optional in-class sessions.

This is a structured program designed to meet the guidelines delineated by the American Bar Association and AACSB International accreditation. Candidates for the program must have a four-year undergraduate degree from an accredited college or university. Students are required to apply to both the MS in Sport Leadership and Coaching program through the College of Business and the JD program through the School of Law. Those interested in this degree option should contact the School of Law Admission Office and College of Business Dean's Office for specific information on application for admissions.

Total Credit Hours: 85

## Master of Science in Law (For Non-Lawyers) - program to be suspended - no new enrollments

### Professional Programs in College of Pharmacy and Health Sciences

Dean John Pezzuto

Senior Associate Dean for Academic Affairs Beth Welch

Assistant Dean for Student Affairs Amy Burton

The Western New England University College of Pharmacy and Health Sciences will be prominently known for excellence in the preparation of professional practitioners as educators of patients and other healthcare professionals and leaders for the betterment of patient care.

The College of Pharmacy and Health Sciences began the professional phase of the pharmacy program in fall 2011. The Doctor of Pharmacy curriculum is designed to prepare learners to enter the practice of pharmacy as general practitioners in a variety of practice settings and deliver optimal patient care to diverse populations. The primary intention of this comprehensive educational program is to transition dependent learners into independent professional practitioners who are dedicated to serving the community in which they live. The curriculum provides learners opportunities to develop the knowledge, skills, and attitudes necessary to become licensed professionals who will provide optimal patient care in a caring, collaborative, safe, and culturally aware manner.

The curriculum entails a competency-based framework, using integrated content and teaching, problem-based approaches when appropriate, integrated technology, and experiential exposure threaded throughout. The curriculum is designed to incrementally develop strong scientific foundations (in the biomedical, pharmaceutical, social and administrative, and clinical sciences) and professional skills. During pharmacy practice experiences, learners

have many opportunities to demonstrate and apply these skills in progressively advanced methods.

For admissions information, contact the College of Pharmacy and Health Sciences at 413-796-2073 or rxadmissions@wne.edu or visit our website.

## Doctor of Pharmacy Major

Program of Study

Program Outcomes

### General Abilities

#### Thinking and Learning

The competent graduate can obtain, understand, analyze, evaluate, and synthesize information in order to problem-solve and make informed, rational, and responsible decisions. The graduate takes responsibility for the acquisition of new knowledge through the process of self-assessment and reflection and a sense of accountability.

#### Social and Cultural Awareness

The competent graduate will have an awareness and understanding of the differences present in a pluralistic society in order to work effectively and collaboratively to produce better outcomes.

#### Active Citizenship and Leadership

The competent graduate understands his/her role as a member of the civic and professional community, taking steps to actively contribute and lead to produce betterments.

#### Personal Judgment (Legal and Ethical)

The competent graduate recognizes the ethical and legal dimensions of pharmacy practice and health policy and makes decisions and actions based on integrity, responsibility, compassion, empathy, and respect.

#### Communication

The competent graduate listens attentively and communicates clearly, utilizing situation appropriate verbal, nonverbal, and written methods, with patients, caregivers, families, and health care team members.

#### Professional Abilities

##### Knowledge Base

The competent graduate has a solid foundation of scientific knowledge and is able to apply basic science in the practice of pharmacy, especially with regard to safe medication usage.

##### Patient-Centered Care

The competent graduate provides patient-centered care in collaboration with interprofessional health care providers as well as the patient and their caregivers in order to produce optimal medication therapy outcomes. The competent graduate provides pharmacy care based on sound therapeutic principles and evidence-based data.

##### Population-Based Care

The competent graduate provides therapeutic guidance in the provision of population-based care as part of an interprofessional collaboration. The competent graduate develops and implements population-specific programs and protocols based on sound therapeutic principles and evidence based data.

##### Systems Management

The competent graduate uses and manages health care resources in cooperation with patients, health care providers, and administrative

and support personnel in the professional environment in order to evaluate, implement, and provide patient care services, including pharmaceutical dispensing, with the goal of improving patient outcomes. The health care resources a graduate may use and manage include: human, physical, medical, informational, and technological resources as well as medical use systems.

#### Public Health and Wellness

The competent graduate will proactively promote good health and disease prevention in cooperation with patients, communities, at-risk populations, and other health care professionals for the public welfare.

#### Collaboration and Teamwork

The competent graduate has the ability to actively participate as a healthcare team member to provide patient care and population care and effectively manage healthcare systems. The graduate demonstrates mutual respect and understanding and values the roles of the healthcare team in the provision of patient care.

## Prerequisite Coursework Requirements

### Required Pre-Pharmacy Degree Requirements

- General Biology 1 & 2 with labs (8 credits)
- Human Anatomy and Physiology I & 2 with labs (8 credits)
- Microbiology with lab (4 credits)
- General Chemistry 1 & 2 with labs (8 credits)
- Organic Chemistry 1 & 1 with labs (8 credits)
- Physics with lab (4 credits)
- Calculus (3 credits)
- Statistics (3 credits)
- English Composition (6 credits)
- Psychology (3 credits)
- Economics (3 credits)
- Ethics\* (3 credits)
- Social Science elective\*\* (3 credits)
- Public Speaking (3 credits)

\*Coursework in philosophy or religion may be substituted for ethics, but cannot be utilized for the Bachelor of Science in Pharmacy Studies

\*\*Coursework in history, sociology, political science, law and society, or public/population-based health can be utilized to fulfill this requirement; coursework in history must be utilized for the Bachelor in Science in Pharmacy Studies

## Degree Requirements

### Required Coursework

#### First Professional Year - Fall Semester

PHAR 510	Intro to Pharmacy	1 cr
PHAR 511	Drug Information & Informatics	2 cr
PHAR 512	Immunology	3 cr
PHAR 513	Biochemistry	3 cr
PHAR 514	Pharmaceutics I	2 cr
PHAR 516	Pharmacy Ethics	3 cr.
PHAR 517	Healthcare Policy & Delivery	2 cr.
PHAR 518	Pharmaceutical Calculations	2 cr
PHAR 580	Professional Development I	0 cr

**Subtotal: 18**

#### First Professional Year - Spring Semester

PHAR 520	Healthcare Communications	3 cr.
PHAR 522	Pathophysiology	3 cr
PHAR 523	Genetics & Genomics	2 cr
PHAR 524	Pharmaceutics II	2 cr
PHAR 525	Pharmaceutics II Lab	1 cr
PHAR 526	Pharmacy Outcomes	2 cr.
PHAR 527	Self Care Therapeutics	3 cr
PHAR 528	Intro to Pharmacy & Health Prof II	1 cr
PHAR 540	IPPE Health Services	2 cr
	or	
PHAR 541	IPPE Community	2 cr
PHAR 580	Professional Development I	0 cr

**Subtotal: 19**

#### Second Professional Year - Fall Semester

PHAR 610	Principles of Pharmacokinetics	4 cr
PHAR 611	Principles of Pharmacology	3 cr
PHAR 612	Principles of Medicinal Chemistry	3 cr
PHAR 614	Patient Assessment Skills Lab	1 cr
PHAR 615	Professional Pharmacy Practice Lab	1 cr
PHAR 616	Practice Management I	2 crs.
PHAR 642	IPPE Community	2 cr



	or	
PHAR 643	IPPE Health System	2 cr
PHAR 6XX	Pharmacy Elective	3 cr.
PHAR 680	Professional Development II	0 cr

**Subtotal: 19**

## Second Professional Year - Spring Semester

PHAR 621	Integrated Pharmacy Care- Renal	2 crs.
PHAR 622	Integrated Pharmacy Care- Respiratory	2 crs.
PHAR 623	Integrated Pharmacy Care - CVS I	2 crs.
PHAR 624	Integrated Pharmacy Care - CVS II	2 crs.
PHAR 625	Applied Pharmacy Care I	1 crs.
PHAR 626	Practice Management II	2 crs.
PHAR 627	Sterile Products Lab	1 cr
PHAR 628	Drug Lit Eval & Evidence-Based Practice	3 cr
PHAR 6XX	Pharmacy Elective	3 cr.
PHAR 680	Professional Development II	0 cr

**Subtotal: 18**

## Third Professional Year - Fall Semester

PHAR 710	Integrated Pharmacy Care- GI/Nutr/Hep	3 cr
PHAR 711	Integrated Pharmacy Care- Endo/Repro/Gu	3 cr
PHAR 712	Integrated Pharmacy Care-Infect Dis I	2 cr
PHAR 713	Integrated Pharmacy Care-Infect Dis II	2 cr
PHAR 715	Applied Pharmacy Care II	1 cr
PHAR 718	Pharmacy Law I	2 cr
PHAR 744	IPPE Health System	2 cr

or

PHAR 745	IPPE Community	2 cr
PHAR 7XX	Pharmacy Elective	3 cr.
PHAR 780	Professional Development III	0 cr.

**Subtotal: 18**

## Third Professional Year - Spring Semester

PHAR 720	Integrated Pharmacy Care- Derm/Musc	2 cr
PHAR 721	Integrated Pharmacy Care- Neuro/CNS	2 cr
PHAR 722	Integrated Pharmacy Care-Psych	3 cr
PHAR 723	Integrated Pharmacy Care- Heme/Onc	3 cr

PHAR 724	Integrated Pharmacy Care-Spec Population	2 cr
PHAR 725	Applied Pharmacy Care III	1 cr
PHAR 727	Patient Care Management	3 cr
PHAR 728	Pharmacy Law II	2 cr
PHAR 780	Professional Development III	0 cr.

**Subtotal: 18**

## Fourth Professional Year

PHAR 800	APPE Ambulatory Care	6 cr
PHAR 801	APPE Acute Care	6 cr
PHAR 802	APPE Community Care	6 cr
PHAR 803	APPE Institutional	6 cr
PHAR 804	APPE Elective	6 cr
PHAR 805	APPE Elective	6 cr
PHAR 880	Professional Development IV	0 cr

**Subtotal: 36**

Subtotal: 146

## Degree Requirements-Distance Pathway

Program Description:

Pending approval from the Accreditation Council for Pharmacy Education (ACPE), the College of Pharmacy and Health Sciences will offer a distance pathway to the Doctor of Pharmacy (PharmD) degree for those who desire more flexibility through online and limited campus instruction. The program prepares learners to be general practitioners in a variety of settings and to deliver optimal patient care to diverse populations. This comprehensive educational program transitions dependent learners into independent professional practitioners who are dedicated to serving the community in which they live. The curriculum provides opportunities to develop the knowledge, skills, and attitudes necessary to become licensed professionals who will provide optimal patient care in a caring, collaborative, safe, and culturally aware manner.

## Required Coursework

## First Professional Year - Fall Semester

PHAR 510	Intro to Pharmacy	1 cr
PHAR 511	Drug Information & Informatics	2 cr
PHAR 512	Immunology	3 cr
PHAR 513	Biochemistry	3 cr
PHAR 514	Pharmaceutics I	2 cr
PHAR 516	Pharmacy Ethics	3 cr.
PHAR 517	Healthcare Policy & Delivery	2 cr.
PHAR 518	Pharmaceutical Calculations	2 cr
PHAR 580	Professional Development I	0 cr

**Subtotal: 18**

## First Professional Year - Spring Semester

PHAR 520	Healthcare Communications	3 cr.
PHAR 522	Pathophysiology	3 cr
PHAR 523	Genetics & Genomics	2 cr
PHAR 524	Pharmaceutics II	2 cr
PHAR 525	Pharmaceutics II Lab	1 cr
PHAR 526	Pharmacy Outcomes	2 cr.
PHAR 527	Self Care Therapeutics	3 cr
PHAR 528	Intro to Pharmacy & Health Prof II	1 cr
PHAR 580	Professional Development I	0 cr
		<b>Subtotal: 17</b>

## First Professional Year - Summer

PHAR 540	IPPE Health Services	2 cr
	or	
PHAR 541	IPPE Community	2 cr
PHAR 642	IPPE Community	2 cr
	or	
PHAR 643	IPPE Health System	2 cr
		<b>Subtotal: 4</b>

## Second Professional Year - Fall Semester

PHAR 610	Principles of Pharmacokinetics	4 cr
PHAR 611	Principles of Pharmacology	3 cr
PHAR 612	Principles of Medicinal Chemistry	3 cr
PHAR 614	Patient Assessment Skills Lab	1 cr
PHAR 615	Professional Pharmacy Practice Lab	1 cr
PHAR 616	Practice Management I	2 crs.
PHAR 6XX	Pharmacy Elective	3 cr.
PHAR 680	Professional Development II	0 cr
		<b>Subtotal: 17</b>

## Second Professional Year - Spring Semester

PHAR 621	Integrated Pharmacy Care- Renal	2 crs.
PHAR 622	Integrated Pharmacy Care- Respiratory	2 crs.
PHAR 623	Integrated Pharmacy Care - CVS I	2 crs.
PHAR 624	Integrated Pharmacy Care - CVS II	2 crs.
PHAR 625	Applied Pharmacy Care I	1 crs.
PHAR 626	Practice Management II	2 crs.
PHAR 627	Sterile Products Lab	1 cr
PHAR 628	Drug Lit Eval & Evidence-Based	3 cr

## Practice

PHAR 6XX	Pharmacy Elective	3 cr.
PHAR 680	Professional Development II	0 cr
		<b>Subtotal: 18</b>

## Second-Professional-Year - Summer

PHAR 744	IPPE Health System	2 cr
	or	
PHAR 745	IPPE Community	2 cr
		<b>Subtotal: 2</b>

## Third Professional Year - Fall Semester

PHAR 710	Integrated Pharmacy Care-GI/Nutr/Hep	3 cr
PHAR 711	Integrated Pharmacy Care-Endo/Repro/Gu	3 cr
PHAR 712	Integrated Pharmacy Care-Infect Dis I	2 cr
PHAR 713	Integrated Pharmacy Care-Infect Dis II	2 cr
PHAR 715	Applied Pharmacy Care II	1 cr
PHAR 718	Pharmacy Law I	2 cr
PHAR 7XX	Pharmacy Elective	3 cr.
PHAR 780	Professional Development III	0 cr.
		<b>Subtotal: 16</b>

## Third Professional Year - Spring Semester

PHAR 720	Integrated Pharmacy Care-Derm/Musc	2 cr
PHAR 721	Integrated Pharmacy Care-Neuro/CNS	2 cr
PHAR 722	Integrated Pharmacy Care-Psych	3 cr
PHAR 723	Integrated Pharmacy Care-Heme/Onc	3 cr
PHAR 724	Integrated Pharmacy Care-Spec Population	2 cr
PHAR 725	Applied Pharmacy Care III	1 cr
PHAR 727	Patient Care Management	3 cr
PHAR 728	Pharmacy Law II	2 cr
PHAR 780	Professional Development III	0 cr.
		<b>Subtotal: 18</b>

## Fourth Professional Year - Summer or Fall or Spring

PHAR 800	APPE Ambulatory Care	6 cr
PHAR 801	APPE Acute Care	6 cr
PHAR 880	Professional Development IV	0 cr
		<b>Subtotal: 12</b>

## Fourth Professional Year - Summer or Fall or Spring

PHAR 802	APPE Community Care	6 cr
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PHAR 803	APPE Institutional	6 cr
PHAR 880	Professional Development IV	0 cr
		<b>Subtotal: 12</b>

Fourth Professional Year - Summer or Fall or Spring

PHAR 804	APPE Elective	6 cr
PHAR 805	APPE Elective	6 cr
PHAR 880	Professional Development IV	0 cr
		<b>Subtotal: 12</b>

Total Credit Hours: 146

## Master of Science in Pharmaceutical Sciences

### Overview

A 45 credit Master of Science in Pharmaceutical Sciences (“MSPS”) degree is being offered by the Department of Pharmaceutical and Administrative Sciences in the College of Pharmacy and Health Sciences. This degree program can be completed in five full-time semesters (fall, spring, summer, fall, spring). Students can customize the focus area of their research degree through available elective courses and by the selection of a thesis advisor in a specific field of medicinal chemistry, pharmacology, pharmaceuticals, immunology, neuroscience, pharmacogenomics, toxicology, oncology, biomedical engineering, or cosmeceutical sciences. The available research focus areas for the MSPS degree are: Pharmacological and Biomedical Sciences; Pharmaceuticals and Drug Delivery; Medicinal Chemistry and Drug Development; and Pharmacoeconomics and Healthcare Data Analytics.

### Program Outcomes

Students will be expected to achieve the following primary outcomes prior to graduation, which will demonstrate competency in core knowledge areas and relevant skill sets:

1. To comprehend and have a thorough understanding of fundamental biological systems, processes and core principles that are critical to proficiency in the pharmaceutical sciences.
2. To comprehend and have a thorough understanding of pharmaceutical sciences and focus areas critical to developing proficiency in this field, including pathophysiology, pharmacology, medicinal chemistry and drug development, pharmaceuticals and drug delivery, pharmacoeconomics and health care delivery.
3. To gain an understanding and proficiency in basic pharmaceutical techniques.
4. To achieve proficiency in understanding and applying biologically relevant statistical analysis to research methodology and experimental data interpretation.
5. To be abreast of current scientific advances in the pharmaceutical sciences.
6. To develop proficiency in skills such as hypothesis testing in a focus area of the program.
7. To develop proficiency in executing aims of a research project based on specifically developed hypotheses.
8. To develop proficiency in the analysis of experimental data and its interpretation acquired in fulfillment of a hypothesis-driven research project.
9. To develop proficiency in presentation of research data acquired in fulfillment of a hypothesis-driven research project.
10. To develop proficiency in synthesizing experimental data from a research project and utilizing it to draw conclusions about the original hypothesis.

### MSPS Admissions Requirements

Application Requirements:

- Bachelor’s degree: A bachelor’s degree from a regionally accredited college or university.
- Preferred minimum GPA: Undergraduate GPA of 3.00 or foreign equivalent is preferred.
- Transcripts: Transcripts from all colleges attended must be submitted to PharmGrad. Students already enrolled at WNE must request their WNE transcript be submitted to PharmGrad to complete their application.

- A current résumé or Curriculum Vitae must be uploaded to the Documents section within PharmGrad.

- Recommendations: A minimum of two evaluator names must be submitted within your PharmGrad application; one recommendation must be from a professor.

- English-language test scores are required for all applicants who are non-native English speakers who have resided in a country, where English is the primary language, for less than 10 years, UNLESS the applicant has earned or is degree pending (will have earned by anticipated matriculation date) a bachelor’s degree or graduate degree following three or more years of campus-based post-secondary instruction in the United States.

- PharmD applicants can use any of the following standardized tests to meet our English language requirement:

- TOEFL—79 IBT
- IELTS—6.5
- PTE Academic—58
- STEP Eiken—2A
- iTEP—4
- Duolingo—110 DET

- List of countries in which English language testing would be waived because it is the primary language:

- Antigua and Barbuda, Australia, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Ireland, Jamaica, New Zealand, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago, United Kingdom

- Qualified candidates may be invited to participate in an interview and complete a writing sample.

Total Credit Hours: 45

### Degree Requirements

Total Credit Hours: 45

### Core Course Requirements - 36 credits

Requirements - 36 crs

- Seminar and Journal Club (4 credits, 1 per semester)
- Immunology (3 credits)
- Biochemistry (3 credits)

- Pharmaceutics 1 (2 credits)
- Principles of Pharmacology (3 credits)
- Principles of Med. Chemistry (3 credits)
- Pathophysiology (3 credits)
- Genetics and Genomics (2 credits)
- Pharmaceutics II (2 credits)
- Pharmaceutics II Lab (1 credit)
- Data Analysis and Biostatistic (3 credits)
- Analytical Techniques (1 credit)
- Thesis specific research (6 credits, 2 credits per semester)

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**Subtotal: 36**

Electives - 9 crs

\* 6 of the 9 credits of electives selected after consultation with thesis advisor.

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**Subtotal: 9**

### Course Sequence

First Year - Fall Semester

PHAR 512	Immunology	3 cr.
PHAR 513	Biochemistry	3 cr.
PHAR 514	Pharmaceutics I	2 cr.
PHAR 611	Principles of Pharmacology	3 cr.
PHAR 612	Principles of Medicinal Chemistry	3 cr.
PHRSC 510	Seminar & Journal Club 1	1 cr.
PHRSC 527	Data Analysis & Biostatistics	3 cr.

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**Subtotal: 18**

First Year - Spring Semester

PHAR 522	Pathophysiology	3 cr.
PHAR 523	Genetics & Genomics	2 cr.
PHAR 524	Pharmaceutics II	2 cr.
PHAR 525	Pharmaceutics II Lab	1 cr.
PHRSC 520	Seminar & Journal Club 2	1 cr.
PHRSC 526	Analytical Techniques Lab	1 cr.
PHRSC xxx	Pharmacy Science Elective	3 cr.

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**Subtotal: 13**

Second Year - Summer Semester

PHRSC 528	Thesis Research 1	2 cr.
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**Subtotal: 2**

Second Year - Fall Semester

PHRSC 610	Seminar & Journal Club 3	1 cr.
PHRSC xxx	Pharmacy Science Elective	3 cr.
PHRSC 618	Thesis Research 2	2 cr.

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**Subtotal: 6**

Second Year - Spring Semester

PHRSC 620	Seminar & Journal Club 4	1 cr.
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PHRSC xxx	Pharmacy Science Elective	3 cr.
PHRSC 628	Thesis Research 3	2 cr.

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**Subtotal: 6**

Subtotal: 45

Total Credit Hours: 45

## Dual Master of Science in Pharmaceutical Sciences and Doctor of Pharmacy

### Overview

The College of Pharmacy and Health Sciences offers both the professional Doctorate of Pharmacy (PharmD) and the thesis-based Master of Science in Pharmaceutical Sciences (MSPS). The MSPS program offers students a wide array of research focus areas in which to develop their Master's thesis and research, including pharmacological and biomedical sciences, pharmaceutics and drug delivery, medicinal chemistry and drug development, and pharmacoconomics and healthcare data analytics. The intent of this dual degree option is to expand the opportunities available to pharmacy graduates, particularly those pursuing clinical fellowships or residencies with an eventual goal of working in the pharmaceutical industry, academics, or at an academic medical center.

This is a dual degree program, where students completing the requirements for each program will receive two separate degrees, the PharmD degree and the MSPS degree, within five years of entry as a PharmD student. Initially, students admitted by the College's Admissions are only admitted into the PharmD degree portion of the program. Transition into the MSPS program is not automatic, nor is acceptance into the MSPS program guaranteed, but requires application and acceptance into the MSPS program. The MSPS program admission requirements can be found in the "Master of Science in Pharmaceutical Sciences" program description in this catalogue.

PharmD students would be eligible to apply for admission to the MSPS degree program after January 1 during their first year in the PharmD program. Application to the MSPS program could occur later in the PharmD program; however, such later application and enrollment in the MSPS program could impact on the timeline to completion. Candidates must successfully submit their application materials to be considered for enrollment in the MSPS portion of the dual degree option.

The PharmD program consists of 146 credits (refer to "Doctor of Pharmacy Major" in this catalogue for details) and the MSPS program consists of 45 credits (refer to "Master of Science in Pharmaceutical Sciences" in this catalogue for details). The dual degree option was designed to take advantage of courses already part of the PharmD program, so the two programs share 22 required and possibly, 6 elective credits. With required and elective course sharing, the dual degree program can be accomplished in 5 years, 1 year past the completion of the PharmD degree. In addition, to accommodate those students who elect to delay taking of the NAPLEX/MPJE (the pharmacist licensing examinations) until they finish the MSPS program, the mock NAPLEX examinations, and week of NAPLEX/MPJE review would be available to these dual degree students as an option during the fifth year of the dual degree program.

Total Credit Hours: 45

**Degree Requirements**

The semester-by-semester PharmD-MSPS dual degree program course listings below only show those courses required in both programs (PharmD and MSPS), those that are required in one program but count as an elective in the other, or those specific to the MSPS.

**Course Sequence****1st Year PharmD - Fall Semester**

PHAR 512	Immunology	3 cr.
PHAR 513	Biochemistry	3 cr.
PHAR 514	Pharmaceutics I	2 cr.

**Subtotal: 8****1st Year PharmD - Spring Semester**

PHAR 522	Pathophysiology	3 cr.
PHAR 523	Genetics & Genomics	2 cr.
PHAR 524	Pharmaceutics II	2 cr.
PHAR 525	Pharmaceutics II Lab	1 cr.

**Subtotal: 8****2nd Year PharmD/1st Year MSPS - Fall Semester**

PHAR 611	Principles of Pharmacology	3 cr.
PHAR 612	Principles of Medicinal Chemistry	3 cr.

**Subtotal: 6****2nd Year PharmD/1st Year MSPS - Spring Semester**

PHRSC 526	Analytical Techniques Lab	1 cr.
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**Subtotal: 1****3rd Year PharmD/2nd Year MSPS - Fall Semester**

PHRSC 510	Seminar & Journal Club 1	1 cr.
PHRSC 527	Data Analysis & Biostatistics	3 cr.

**Subtotal: 4****3rd Year PharmD/2nd Year MSPS - Spring Semester**

PHAR 723	Integrated Pharmacy Care-Heme/Onc	3 cr.
PHRSC 520	Seminar & Journal Club 2	1 cr.

**Subtotal: 4****4th Year PharmD – Summer, Fall, and Spring Semesters****5th Year Post-PharmD/3rd Year MSPS - Summer Semester**

PHRSC 528	Thesis Research 1	2 cr.
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**Subtotal: 2****5th Year Post-PharmD/3rd Year MSPS - Fall Semester**

PHRSC 610	Seminar & Journal Club 3	1 cr.
PHRSC 618	Thesis Research 2	2 cr.
PHRSC-PHAR-GEN xxx	Pharmacy Science-Pharmacy-General Elective	3 cr.

**Subtotal: 6****5th Year Post-PharmD/3rd Year MSPS - Spring Semester**

PHRSC 620	Seminar & Journal Club 4	1 cr.
PHRSC 628	Thesis Research 3	2 cr.
PHRSC-PHAR-GEN xxx	Pharmacy Science-Pharmacy-General Elective	3 cr.

**Subtotal: 6**

Subtotal: 45

Total Credit Hours: 45

**Master of Science in Pharmacogenomics***Overview*

A 41 credit Master of Science in Pharmacogenomics (“MSPGx”) degree is being offered by the Department of Pharmaceutical and Administrative Sciences in the College of Pharmacy and Health Sciences. This degree program can be completed in as few as three full-time semesters (fall, spring, summer). With an MSPGx degree from WNE, you will be ready to make the most of emerging opportunities from basic or industrial research to clinical implementation through a well-rounded program that aligns with your personal career goals.

Pharmacogenomics is a fast-growing field that helps medical practitioners prescribe personalized treatment plans to patients based on how they may respond to medications due to their DNA sequence. Pharmacogenomics supports personalized or precision medicine, which explores a patient’s genetics, environment, and lifestyle as a way to design a treatment plan that will best suit the patient. The goal of this modern approach to medication therapy is to limit adverse effects, while optimizing response and beneficial outcomes. The design of the WNE Master of Science in Pharmacogenomics has purposely integrated all major aspects of this field, from basic genetics to clinical implementation.

*Program Outcomes*

Students will be expected to fulfill the following primary goals and objectives prior to graduation, which will demonstrate competency in core knowledge areas and relevant skill sets:

1. To comprehend and have a thorough understanding of fundamental biological systems, processes, and core principles that are critical to proficiency in the field of pharmacogenomics, including knowledge of basic cell biology, biochemistry, genetics, and other biological systems.
2. To comprehend and have a thorough understanding of pharmacogenomics and other areas critical to developing proficiency in this field, including pathophysiology, pharmacology, healthcare outcomes, and medical genetics.
3. To gain an understanding and proficiency in basic pharmaceutical and molecular genetic techniques.
4. To achieve proficiency in understanding and applying biologically relevant statistical analysis to research methodology, and the interpretation and analysis of data from genetic sequencing.
5. To be abreast of current scientific advances in the fields of pharmaceutical sciences and pharmacogenomics.
6. To achieve proficiency in skills such as hypothesis development and experimental design.

7. To acquire skills needed for the implementation of pharmacogenomics in a clinical setting.

8. To develop proficiency in oral and written communication related to dissemination of pharmacogenomics concepts and interprofessional collaboration.

#### *MSPGx Admissions Requirements*

Applications to the MSPGx program must be submitted via PharmGrad.org.

Application Requirements:

Bachelor's degree: A bachelor's degree from a regionally accredited college or university.

Preferred Prerequisites: A previous genetics course.

Minimum GPA: Undergraduate GPA of at least 2.7 or foreign equivalent.

Transcripts: Transcripts from all colleges attended must be submitted to PharmGrad. Students already enrolled at WNE must request their WNE transcript be submitted to PharmGrad to complete their application.

Recommendations: A minimum of two evaluator names must be submitted within your PharmGrad application; one recommendation must be from a professor.

A current résumé or CV must be uploaded to the Documents section within PharmGrad.

English-language test scores are required for all applicants who are non-native English speakers who have resided in a country, where English is the primary language, for less than 10 years, UNLESS the applicant has earned or is degree pending (will have earned by anticipated matriculation date) a bachelor's degree or graduate degree following three or more years of campus-based post-secondary instruction in the United States. Applicants can use any of the following standardized tests to meet our English language requirement:

- TOEFL—79 IBT
- IELTS—6.5
- PTE Academic—58
- STEP Eiken—2A
- iTEP—4
- Duolingo—110 DET

List of countries in which English language testing would be waived because it is the primary language: Antigua and Barbuda, Australia, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Ireland, Jamaica, New Zealand, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago, and the United Kingdom

Qualified candidates may be invited to participate in an interview and complete a writing sample.

Total Credit Hours: 41

### Degree Requirements

A total of 41 credits is required for graduation.

#### Course Sequence

##### First Year - Fall Semester

PHAR 513	Biochemistry	3 cr.
PHAR 516	Pharmacy Ethics	3 cr.
PHAR 611	Principles of Pharmacology	3 cr.
PHRSC 510	Seminar & Journal Club 1	1 cr.
PHRSC 527	Data Analysis & Biostatistics	3 cr.
PHRSC 551	Introduction to Genetics and Genetic Counseling	3 cr.

**Subtotal: 16**

##### First Year - Spring Semester

PHAR 522	Pathophysiology	3 cr.
PHAR 526	Pharmacy Outcomes	2 cr.
PHRSC 520	Seminar & Journal Club 2	1 cr.
PHRSC 526	Analytical Techniques Lab	1 cr.
PHRSC 552	Advanced Genetics and Genomics	3 cr.
PHRSC 553	Genetic Data Analysis - Bioinformatics	3 cr.

**Subtotal: 13**

##### First Year - Summer Semester

PHRSC 554	Applied Pharmacogenomics Experience	6 cr.
PHRSC 555	Clinical Pharmacogenomics Experience	6 cr.

**Subtotal: 12**

Subtotal: 41

Total Credit Hours: 41

Degree completion requirements:

- 1) All courses passed ("C" or better), with no more than two courses with a grade of "C" or "C+" and
- 2) Attain an overall grade point average of 3.0 or higher.

### Dual Master of Science in Pharmacogenomics and Doctor of Pharmacy

#### *Overview*

The College of Pharmacy and Health Sciences offers both the professional Doctorate of Pharmacy (PharmD) and the Master of Science in Pharmacogenomics (MSPGx). The intent of this dual degree option is to expand the opportunities available to pharmacy

graduates, particularly those pursuing clinical fellowships or residencies with an eventual goal of working in clinical pharmacogenomics-based positions, the pharmaceutical industry, or academics.

This is a dual degree program, where students completing the requirements for each program will receive two separate degrees, the PharmD degree and the MSPGx degree, within four years of entry as a PharmD student. Initially, students admitted by the College's Admissions are only admitted into the PharmD degree portion of the program. Transition into the MSPGx program is not automatic, nor is acceptance into the MSPGx program guaranteed, but requires application and acceptance into the MSPGx program. The MSPGx program admission requirements can be found in the "Master of Science in Pharmacogenomics" program description in this catalogue.

PharmD students would be eligible to apply for admission to the MSPGx degree program during their first semester in the PharmD program. Application to the MSPGx program could occur later in the PharmD program; however, such later application and enrollment in the MSPGx program could have an impact on the timeline to completion. Candidates must successfully submit their application materials to be considered for enrollment in the MSPGx portion of the dual degree option.

The PharmD program consists of 146 credits (refer to "Doctor of Pharmacy Major" in this catalogue for details) and the MSPGx program consists of 41 credits (refer to "Master of Science in Pharmacogenomics" in this catalogue for details). The dual degree option was designed to take advantage of courses already part of the PharmD program, so the two programs share 14 required, and possibly, 9 elective credits. With required and elective course sharing, and taking the 2nd and 3rd year PHAR IPPE courses during the prior summer semesters, and taking the Applied Pharmacogenomics experiential course during the summer, the dual degree program can be accomplished in 4 years, essentially at the same time as the PharmD degree.

Total Credit Hours: 41

## Degree Requirements

The semester-by-semester PharmD-MSPGx dual degree program course listings below only show those courses required in both programs (PHAR-designated courses and PHRSC 552 (replaces PHAR 523)), those that are required in one program but count as an elective in the other (PHRSC 527, 551, and 553), or those specific to the MSPGx (the remaining PHRSC-designated courses).

## Course Sequence

### 1st Year PharmD - Fall Semester

PHAR 513	Biochemistry	3 cr.
PHAR 516	Pharmacy Ethics	3 cr.
		<b>Subtotal: 6</b>

### 1st Year PharmD - Spring Semester

PHAR 522	Pathophysiology	3 cr.
PHAR 526	Pharmacy Outcomes	2 cr.
PHRSC 552	Advanced Genetics and Genomics	3 cr.
		<b>Subtotal: 8</b>

### 2nd Year PharmD/1st Year MSPGx - Fall Semester

PHAR 611	Principles of Pharmacology	3 cr.
PHRSC 510	Seminar & Journal Club 1	1 cr.
PHRSC 551	Introduction to Genetics and Genetic Counseling	3 cr.
		<b>Subtotal: 7</b>

### 2nd Year PharmD/1st Year MSPGx - Spring Semester

PHRSC 520	Seminar & Journal Club 2	1 cr.
PHRSC 553	Genetic Data Analysis - Bioinformatics	3 cr.
		<b>Subtotal: 4</b>

### 3rd Year PharmD/2nd Year MSPGx - Summer Semester

PHRSC 554	Applied Pharmacogenomics Experience	6 cr.
		<b>Subtotal: 6</b>

### 3rd Year PharmD/2nd Year MSPGx - Fall Semester

PHRSC 527	Data Analysis & Biostatistics	3 cr.
		<b>Subtotal: 3</b>

### 3rd Year PharmD/2nd Year MSPGx - Spring Semester

PHRSC 526	Analytical Techniques Lab	1 cr.
		<b>Subtotal: 1</b>

### 4th Year PharmD/3rd Year MSPGx - Summer, Fall, or Spring Semesters

PHRSC 555	Clinical Pharmacogenomics Experience	6 cr.
		<b>Subtotal: 6</b>

Subtotal: 41

Total Credit Hours: 41

MSPGx Degree completion requirements:

- 1) All courses passed ("C" or better), with no more than two courses with a grade of "C" or "C+" and
- 2) Attain an overall grade point average of 3.0 or higher.

## Doctor of Occupational Therapy Program

In its sixth year, the OTD program at Western New England University is restructuring the curriculum following an extensive curricular review process. The restructured curriculum will move to an eight-semester model from the previous three-year model. This will allow for a more efficient and targeted implementation of the curriculum design, and will be even more effective in fostering student learning and experiential progression.

Students who entered the OTD program prior to academic year 2022-2023 should take note that course titles, credits, and the sequence of courses has changed. Students should be sure to refer to the Catalogue for the year in which they entered the OTD program.

### General Information

The World Health Organization has heralded the call for a global health workforce to meet the needs of an interdependent world

(WHO, 2001 & 2013). International leaders in healthcare have identified a need to invest in developing healthcare workers who are armed with strategies to promote health and prevent disease and injury (Frenk et al., 2010). Creating a responsive, interprofessional healthcare workforce is the domain of professional education (IPEC, 2011).

#### Program Emphasis

The OTD program at Western New England University is responding to the national and international call for changing the way healthcare is delivered, and the way healthcare professionals are educated by emphasizing:

- population health perspectives that focus on community health, wellness and prevention, and health literacy;
- innovative interprofessional practice models in traditional and community-based health settings that focus on collaborative teams;
- interprofessional education/practice research applications that permit faculty and students to develop as applied scholars of teaching and practice;
- practitioner, leader, and scholar roles and competencies to revolutionize the delivery of inclusive, equitable, client-centered, evidence-based, culturally-competent, and distinctive occupational therapy

#### Program Outcomes

##### A. Academic Division Goals:

1. Develop and implement a forward-thinking, graduate Doctor of Occupational Therapy (OTD) Program that prepares entry-level graduates for leadership roles in global health care, education and community service.
2. Ensure that a critical outcome of the OTD program is that graduates are provided with a conceptual framework and applied strategies to excel at client-centered, evidence-based, and collaborative interprofessional practice, as a means to innovatively transform the way that patient's/clients receive care in current medical, educational, and community-based settings.
3. Academically develop and support a high quality graduate occupational therapy faculty membership who will excel in professional teaching, learner mentorship, and scholarship roles in ways that will enhance the reputation of the Division, the COPHS and Western New England University (WNE).
4. Enhance the image and visibility of the Division of Occupational Therapy within College of Pharmacy and Health Sciences, and the larger WNE community.

##### B. Student Learning Outcomes:

By demonstrating the application of the curriculum design themes and threads into applied practice, OTD Students will:

##### Interprofessional Practice/Education & Diversity Themes and Autonomy/Identity Thread:

- articulate the philosophical, theoretical, and conceptual foundations upon which the occupational therapy process is based, and define the value of occupations to performance and participation in life;
- exemplify the profession's core values/principles in the practice of occupational therapy to diverse groups of consumers/communities,

and other professionals;

- demonstrate the ability to define and implement high quality occupational therapy in diverse systems of service delivery including medical, social, educational, and community-based practice settings, including both traditional and nontraditional sites;
- identify and understand the importance of collaborative social services, educational and healthcare teams, and demonstrate the role of occupational therapy as part of an intraprofessional and interprofessional team of health care providers;

##### Population Health/Cultural Competence Themes and Clinical Excellence Thread:

- utilize reasoning (procedural, interactive, narrative, ethical, scientific, pragmatic) in the planning and delivery of occupation-based and evidence-driven occupational therapy practice. This includes direct services such as consultation, evaluation, intervention, treatment and discharge planning, and indirect services such as advocacy, policy initiatives, and program development;
- demonstrate appropriate cultural sensitivity and awareness in the management and provision of occupational therapy service delivery
- demonstrate an understanding of the principles, and implement the corresponding practices necessary to focus on the triple-aim of health care, i.e. simultaneously:
  - 1) improving the health of population;
  - 2) enhancing the experience and outcomes of the individual patients/clients; and
  - 3) reducing the cost of care for the benefit of individuals and communities;
- utilize conceptual models to develop occupational therapy programs that are focused on prevention, wellness, primary care, health literacy, and reducing health disparities in existing settings and emerging practice settings;

##### Technology/Health Literacy Themes & Scholarship Thread:

- employ technology to engage students, collaborators, and consumers in coordination of services, to: improve access to care; reduce health disparities; support quality of life; and improve personal and population health needs;
- utilize specific learning platforms and other technology to foster health literacy by providing access to general health care information (e.g. library databases; on-line or cellular applications), and individual-specific health information (e.g. electronic health records or telehealth applications) in a variety of contexts;
- identify, evaluate and recommend the use of adaptive equipment and assistive technology to promote functional performance and participation across the lifespan;
- gather, analyze, and interpret the results of evaluations and scholarly projects that will provide benefit to individual consumers and the health of populations;

##### Multiple Curriculum Design Themes & Leadership Thread:

- identify personal goals, interests and appropriate outcomes as a basis for planning a multi-component doctoral experiential capstone project. The project may focus on clinical practice skills, research skills, administration, leadership, program and policy development, advocacy, education, or theory development;
- synthesize knowledge from preparatory coursework to support the development of a capstone project that includes: conducting a needs assessment & identifying a guiding theoretical perspective; developing a research question and appraising the literature proposal; and designing a project methodology;
- engage in leadership development by utilizing faculty and external site mentorship to exemplify an integration of didactic/fieldwork experience in a health related setting;
- embody advanced learning skills by successfully implementing an on-site experiential residency. The residency experience includes: implementing a scholarly project; collecting and synthesizing data;



and interpreting findings and drawing conclusions;

- model leadership in transforming health care practice by completing a research-based professional paper and delivering a professional presentation with the goal of professional dissemination (e.g. manuals; policy documents; publications) to discuss the project findings relative to the setting and occupational therapy practice.

#### Admission Requirements

Candidates seeking admission to the OTD program should have completed a baccalaureate degree from an accredited institution of higher learning and be prepared to provide transcripts of all previous academic work. Transcripts from non-U.S. countries must be evaluated through a recognized evaluation service.

Candidates must have earned an undergraduate GPA of 3.0 (lower GPA's will be considered on a case-by-case basis). The GRE is not required for admission, however, GRE scores for testing that occurred with the last five years will be considered in admission decisions if submitted.

#### Program Structure

Rapidly changing healthcare systems are demanding more of entry-level practitioners. The OTD curriculum is meeting this call by providing academic preparation beyond a generalist level, including advanced graduate knowledge, skills, and fieldwork/experiential opportunities. The OTD program is a full-time program completed over 8 consecutive semesters including summers. The 109 credit curriculum will include:

- Level I Fieldwork (Five 1-credit courses over five semesters)
- Level II Fieldwork (960 hours)
- Doctoral Experiential Capstone (640 hours)

The program combines opportunities for classroom learning, the development of performance laboratory skills, and on-site practice experience (i.e. Level I & Level II Fieldwork). The program integrates sequential course content with a series of 5 Level I Fieldwork experiences (Year One and Two), providing a strong foundation for Level II Fieldwork (Years 2 and 3), and the Doctoral Experiential Capstone (Year 3, Semester 8). Level II Fieldwork must be completed within 2 years of completing entry-level OTD coursework. The curriculum permits students to develop entry-level skills in current and emerging occupational therapy practice areas. The doctoral experiential capstone takes place at an off-campus site, and provides students with advanced skills beyond generalist practice in areas of leadership, research, advocacy and program development/implementation/evaluation.

The curriculum design includes four primary professional themes: Leadership; Scholarship; Clinical Excellence; and Autonomy/Identity. Evolving from these broad themes are the core interwoven threads upon which the curriculum is built. The threads are: Interprofessional Education/Practice; Information/Assistive Technology; Health Literacy, Diversity, and Cultural Competence; and Population/Community Based Health Practices. A series of course sequences are designed to tie the threads into a complete doctoral curriculum. The course sequences include: Occupational Performance (2 Adult practice courses, 2 Lifespan courses, and 2 Children and Youth courses); Population Health and Interprofessional Practice 1 and 2; Research/Evidence-Based Practice 1 and 2; Level I

fieldwork 1 through 5; Level II Fieldwork 1 and 2; and Doctoral Experiential Development and Mentorship 1 through 4.

For a complete overview of the curriculum visit [www.wne.edu/otd](http://www.wne.edu/otd). For course descriptions and course prerequisites refer to the graduate course descriptions in this catalog.

Total Credit Hours: 109

#### Degree Requirements

#### Prerequisite Coursework Requirements - 24 crs.

- Human Anatomy and Physiology (8 credits)
- Physics (3 or 4 credits) or Kinesiology (3 credits)
- Sociology, Social Psychology or Anthropology (3 credits)
- Developmental Psychology or Lifespan Development (3 credits)
- Abnormal Psychology (3 credits)
- Statistics (3 credits)\*
- Medical Terminology (1 credit)\*

\*Statistics and Medical Terminology courses completed more than five years prior to applying to the OTD Program cannot be used to satisfy prerequisite requirements.

For a complete overview of the Admissions requirements, please visit [www1.wne.edu/pharmacy-and-health-sciences/admissions/otd/admissions-requirements.cfm](http://www1.wne.edu/pharmacy-and-health-sciences/admissions/otd/admissions-requirements.cfm)

#### OTD Degree Requirements Year 1

##### Fall 1 Degree Requirements List

OTD 500	Occupational Therapy/Occupational Science	2 crs.
OTD 504	Foundations of Occupational Therapy Practice	2 crs.
OTD 506	Group Interventions & Therapeutic Use of Self	2 crs.
OTD 509	Functional Anatomy & Kinesiology	4 crs.
OTD 512	Evaluation: Occupational Profile and Analysis of Occupations	2 crs.
OTD 517	Occupational Performance: Mental Health	4 crs.
OTD 518	Level IA Fieldwork Experience	1 cr.

**Subtotal: 17**

##### Spring 1 Degree Requirements List

OTD 523	Assessment: Theory and Measures	2 crs.
OTD 525	Research/Evidence-Based Practice 1	3 crs.

OTD 527	Occupational Performance: Acute & Chronic Care OT	4 crs.
OTD 531	Clinical Applications of Neuroscience	4 crs.
OTD 537	Occupational Performance: Post-Acute and Outpatient OT	4 crs.
OTD 539	Level IB Fieldwork Experience	1 cr.

**Subtotal: 18**

## Summer 1 Degree Requirements List

OTD 541	Doctoral Experiential 1: Needs Assessment & Program Development	2 crs.
OTD 544	Doctoral Experiential 1: Mentorship Seminar	1 cr.
OTD 545	Population Health & Interprofessional Practice: Children & Youth	2 crs.
OTD 547	Occupational Performance: Infants & Young Children	4 crs.
OTD 549	Level 1C Fieldwork Experience	1 cr.

**Subtotal: 10**

Subtotal: 45

## OTD Degree Requirements Year 2

## Fall 2 Degree Requirements List

OTD 627	Transformational Management	2 crs.
OTD 628	Leadership Development & Entrepreneurship	2 crs.
OTD 631	Doctoral Experiential 2: Proposal Development	3 crs.
OTD 634	Doctoral Experiential 2: Mentorship Seminar	2 crs.
OTD 635	Research/Evidence-Based Practice 2	3 crs.
OTD 637	Occupational Performance: Childhood & Adolescence	4 crs.
OTD 639	Level 1D Fieldwork Experience	1 cr.

**Subtotal: 17**

## Spring 2 Degree Requirements List

OTD 645	Population Health and Interprofessional Practice: Adult & Aging	2 crs.
OTD 649	Level 1E Fieldwork Experience	1 cr.
OTD 651	Doctoral Experiential 3: Pre-Implementation Planning	3 crs.
OTD 652	Comprehensive Exam Preparation	1 cr.
OTD 653	Professionalism in OT Practice	2 crs.
OTD 654	Doctoral Experiential 3:	3 crs.

## Mentorship Seminar

OTD 657	Occupational Performance: Community-Based OT	4 crs.
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**Subtotal: 16**

## Summer 2 Degree Requirements List

OTD 675	Level II Fieldwork 1	9 crs.
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**Subtotal: 9**

Subtotal: 42

## OTD Degree Requirements Year 3

## Fall 3 Degree Requirements List

OTD 775	Level II Fieldwork 2	9 crs.
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**Subtotal: 9**

## Spring 3 Degree Requirements List

OTD 781	Doctoral Experiential 4: Implementation/Capstone	10 crs.
OTD 784	Doctoral Experiential 4: Mentorship Seminar	3 crs.

**Subtotal: 13**

Subtotal: 22

Total Credit Hours: 109

## DESCRIPTION OF GRADUATE CERTIFICATE PROGRAMS

### Graduate Certificates in College of Business

#### Graduate Leadership Certificate

##### Entry requirements

Undergraduate degree with GPA of 3.0 or undergraduate degree with evidence of ability to do graduate-level work. No more than three (3) credits approved transfer allowed.

Personal statement of purpose

##### Academic Performance

The academic standards apply to students in the Leadership Certificate program with the following exception:  
Any student who receives two or more grades of "C" or lower, will be dismissed from the program.

*A student may not earn both a leadership certificate and a leadership concentration in the MBA.*

#### Certificate Requirements

Requirement:

MAN 600	Foundations of Leadership Practice	3 cr.
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**Subtotal: 3**

Six credits of the following requirements

MAN 642	Leading Change	3 cr.
MAN 651	Ethical Leadership Practice	3 cr.
MAN 652	Contemporary Issues in Leadership	3 cr.

**Subtotal: 6**

Subtotal: 9

#### Graduate Business Foundations Certificate

##### Entry requirements

Undergraduate degree with GPA of 3.0 or undergraduate degree with evidence of ability to do graduate-level work. No more than three (3) credits approved transfer allowed.

College-Level Financial Reporting or Basic Accounting Course

Personal statement of purpose

##### Academic Performance

The academic standards apply to students in the Business Foundations Certificate program with the following exception:  
Any student who receives one or more grades of "C" or lower, will be dismissed from the program.

#### Certificate Requirements

Certificate requirements

AC 630	Accounting for Decision Makers	3 cr.
MAN 610	Organizational Behavior and Theory	3 cr.
MK 640	Marketing Management	3 cr.

**Subtotal: 9**

Subtotal: 9

Total Credit Hours: 9

#### Graduate Information Management Certificate

##### Entry requirements

Undergraduate degree with GPA of 3.0 or undergraduate degree with evidence of ability to do graduate-level work. No more than three (3) credits approved transfer allowed.

- (1) College-Level Financial Reporting or Basic Accounting Course
- (2) College-Level Basic Statistics Course
- (3) College-Level Introductory Finance Course

Personal statement of purpose

##### Academic Performance

The academic standards apply to students in the Information Management Certificate program with the following exception:  
Any student who receives one or more grades of "C" or lower, will be dismissed from the program.

#### Certificate Requirements

Certificate requirements

BIS 610	Information Technology Management and Applications	3 cr.
BIS 620	Decision Modeling for Analytics	3 cr.
FIN 630	Managerial Finance	3 cr.

**Subtotal: 9**

Subtotal: 9

Total Credit Hours: 9

#### Graduate Sport Leadership Certificate

##### Entry requirements

Undergraduate degree with GPA of 3.0 or undergraduate degree with evidence of ability to do graduate-level work. No more than three (3) credits approved transfer allowed.

Personal statement of purpose

### Academic Performance

The academic standards apply to students in the Leadership Certificate program with the following exception:  
Any student who receives one or more grades of "C" or lower, will be dismissed from the program.

## Certificate Requirements

Certificate requirements

SPMN 631	Sport Leadership and Maximizing Team Performance	3 cr.
SPMN 633	Compliance and Governance of Sport and Athletic Organizations	3 cr.
SPMN 681	Athletic Focus Profession Issues and Research Project	3 cr.

**Subtotal: 9**

Subtotal: 9

Total Credit Hours: 9

## Graduate Strategic Decision-Making Certificate

### Entry requirements

Undergraduate degree with GPA of 3.0 or undergraduate degree with evidence of ability to do graduate-level work. No more than three (3) credits approved transfer allowed.

Personal statement of purpose

### Academic Performance

The academic standards apply to students in the Strategic Decision-Making Certificate program with the following exception:  
Any student who receives one or more grades of "C" or lower, will be dismissed from the program.

## Certificate Requirements

Certificate requirements

BUS 610/MAN 611	Business and Its Environment	3 cr.
BUS 680	Strategic Management	3 cr.
MAN 605	Leadership, Problem Solving and Decision Making	3 cr.

**Subtotal: 9**

Subtotal: 9

Total Credit Hours: 9

## Graduate Certificates in College of Engineering

Admission requirements:

1. Bachelor's degree in engineering, or a closely related field, from an accredited college or university.
2. Students seeking admission to the graduate certificate program without such a degree may petition to have their baccalaureate degree and professional experience accepted as a substitute.
3. Student earning this Graduate Certificate and seeking to admission to Master's program (IE or EMGT) must earn a minimum 3.0 GPA for the certificate, and only classes with "B" or better will transfer for credit.

## Graduate Certificate in Engineering Artificial Intelligence (AI)

Artificial Intelligence (AI) has become one of the most disruptive technologies since the turn of the century. Its applications are now ubiquitous in our lives, used in small devices like smart phones and speakers to large industrial applications and self-driving vehicles and a host of other applications. AI can mean different things to different people and people with a diversity of application areas of interest are now interested in AI certification. The United States (US) Government established the National Security Commission on Artificial Intelligence as an independent Commission on August 13, 2018 (<https://www.nsc.ai.gov/home>). Its primary intent was "to consider the methods and means necessary to advance the development of artificial intelligence, machine learning, and associated technologies to comprehensively address the national security and defense needs of the United States."

Top schools in the US (<https://www.usnews.com/best-graduate-schools/top-science-schools/artificial-intelligence-rankings>) are investing in the AI field and creating AI certificates and degree programs. The COE faculty embarked on designing a graduate certificate program in AI in the summer of 2020 and this proposal is the outcome of that effort. The team included faculty from all five of our COE departments.

Given that AI can mean different things to different people with a diversity of application areas of interest, COE has designed an AI certificate program that can be taken by people with diverse backgrounds. It consists of the four (3 cr.) core courses listed below.

1. EE 676/CPE 674/ME 676/CEE 676/IE 676 AI: Applied Fuzzy Logic
2. EE 671/CPE 671/ME 671/CEE 671/IE 671: AI: Machine Learning—Concepts
3. EE 670/CPE 673/ME 670/CEE 673/IE 670 AI: Applied Neural Networks and Machine Learning
4. ME 672/EE 672/CPE 672/IE 672/CEE 674: AI: Machine Learning—Applications

## Degree Requirements

### Graduate Certificate in Engineering Artificial Intelligence (AI) requirements:

Certificate consists of one course, from each of the four AI categories, for a total of four (3 cr.) core courses listed below:

#### AI: Applied Fuzzy Logic

CEE 676	AI: Applied Fuzzy Logic	3 cr.
CPE 674	AI: Applied Fuzzy Logic	3 cr.
EE 676	AI: Applied Fuzzy Logic	3 cr.
IE 676	AI: Applied Fuzzy Logic	3 cr.
ME 676	AI: Applied Fuzzy Logic	3 cr.

**Subtotal: 3**

#### AI: Applied Neural Networks and Machine Learning

CEE 673	AI: Applied Neural Networks and Machine Learning	3 cr.
CPE 673	AI: Applied Neural Networks and Machine Learning	3 cr.
EE 670	AI: Applied Neural Networks and Machine Learning	3 cr.
IE 670	AI: Applied Neural Networks and Machine Learning	3 cr.
ME 670	AI: Applied Neural Networks and Machine Learning	3 cr.

**Subtotal: 3**

#### AI: Machine Learning - Applications

CEE 674	AI: Machine Learning - Applications	3 cr.
CPE 672	AI: Machine Learning - Applications	3 cr.
EE 672	AI: Machine Learning - Applications	3 cr.
IE 672	AI: Machine Learning - Applications	3 cr.
ME 672	AI: Machine Learning - Applications	3 cr.

**Subtotal: 3**

#### AI: Machine Learning - Concepts

CEE 671	AI: Machine Learning - Concepts	3 cr.
CPE 671	AI: Machine Learning - Concepts	3 cr.
EE 671	AI: Machine Learning - Concepts	3 cr.
IE 671	AI: Machine Learning - Concepts	3 cr.
ME 671	AI: Machine Learning - Concepts	3 cr.

**Subtotal: 3**

Total Credit Hours: 12

### Graduate Certificate in Engineering Data Analytics

Data analytics is essential and ubiquitous in solving challenging engineering problems such as process quality control, improvement

of advanced manufacturing, security of large quantity of internet data streams, efficiency improvement of healthcare systems, and profitability enhancement in finance and insurance industries. This graduate certificate program was developed in partnership with the Center for Engineering Data Analytics at Western New England University to be sure that it covers the fundamental data analytical methods and skill set for engineers who expect to excel in data science and analytics professions.

The certificate consists of four 3-credit courses. Each course is in-class/online hybrid that enables students to participate either fully online, fully in-class, or any combination of the two. Course Credits earned are transferable to other graduate certificates as well as a future master's degree if: 1) transferred within 6 years, 2) grade is 'B' or greater.

## Degree Requirements

### Graduate Certificate in Engineering Data Analytics requirements:

IE 601	Advanced Engineering Statistics	3 cr.
EMGT 691	Special Topics in Engineering Management	3 cr.
EMGT 635/IE 635	Operations Research	3 cr.
	And	
BIS 635	Enterprise Analytics with SAP	3 cr.
	or	
EMGT 691	Special Topics in Engineering Management	3 cr.

**Subtotal: 12**

Subtotal: 12

Total Credit Hours: 12

### Graduate Certificate in Engineering Operations Management

Operations management is the administration of engineering and business practices to create the highest level of efficiency possible within an organization by utilizing resources of staff, materials, equipment, and technology to add value and deliver goods and services in a format that best suites client needs. This is accomplished through the structured analysis of system properties and needs, including: plant sizing, inventory sizing and control through supply-chain management, quality control, materials handling, maintenance policies, and minimization of waste. These tasks are complex in any situation. Put into the context of global enterprise systems, and the complexities magnify, and required advanced knowledge, skill, and education to manage. This certificate is designed to be the management-oriented compliment to the Graduate Certificate in Operations Research (analytic-oriented).

The certificate consists of four 3-credit courses. Each course is in-class/online hybrid that enables students to participate either fully online, fully in-class, or any combination of the two. Course Credits earned are transferable to other graduate certificates as well as a future master's degree if: 1) transferred within 6 years, 2) grade is 'B' or greater.

## Degree Requirements

Graduate Certificate in Engineering Operations Management requirements:

EMGT 631/IE 631	Production and Inventory Modeling	3 cr.
EMGT 619/IE 619	Engineering Supply Chain	3 cr.
BIS 633	Independent Study in Business Information Systems	3 cr.
	And	
EMGT 622/IE 622	Lean Production Systems	3 cr.
	or	
EMGT 607	Quality Engineering	3 cr.

**Subtotal: 12**

Subtotal: 12

Total Credit Hours: 12

## Graduate Certificate in Engineering Project Management

Project Management, as a skill-set and career, has been an ever increasing critical element of every engineer and business leader's résumé. Partially this is because nearly half of the engineers working in industry serve in management capacities, and partially because as projects grow in scale and complexity, the specialized skill needed to management them begins to deviate from the skill required to design them. This Graduate Certificate addresses this need by packaging industry relevant course work such that the student receives a practical body of knowledge from across industry disciplines, while also recognizing the needs to satisfy the more dominate industry certification agencies (Project Management Institute—PMI). After earning this certificate, the student is well placed for industry with a stand-alone certificate, partial completion of the requirements of a Master's degree in Engineering Management, as well as prepared for the PMI's PMP examination.

The certificate consists of four 3-credit courses. Each course is in-class/online hybrid that enables students to participate either fully online, fully in-class, or any combination of the two. Course Credits earned are transferable to other graduate certificates as well as a future master's degree if: 1) transferred within 6 years, 2) grade is 'B' or greater.

## Degree Requirements

Graduate Certificate in Engineering Project Management requirements:

EMGT 605	Engineering Management	3 cr.
EMGT 609/CEE 609/IE 609	Strategic Engineering Economics	3 cr.
EMGT 619/IE 619	Engineering Supply Chain	3 cr.
EMGT 648	Project Management	3 cr.

**Subtotal: 12**

Subtotal: 12

Total Credit Hours: 12

## Graduate Certificate in Industrial Safety and Public Health

Operations management is the administration of engineering and business practices to create the highest level of efficiency possible within an organization by utilizing resources of staff, materials, equipment, and technology to add value and deliver goods and services in a format that best suites client needs. This is accomplished through the structured analysis of system properties and needs, including: plant sizing, inventory sizing and control through supply-chain management, quality control, materials handling, maintenance policies, and minimization of waste. These tasks are complex in any situation. Put into the context of global enterprise systems, and the complexities magnify, and required advanced knowledge, skill, and education to manage. This certificate is designed to be the management-oriented compliment to the Graduate Certificate in Operations Research (analytic-oriented).

The certificate consists of four 3-credit courses. Each course is in-class/online hybrid that enables students to participate either fully online, fully in-class, or any combination of the two. Course Credits earned are transferable to other graduate certificates as well as a future master's degree if: 1) transferred within 6 years, 2) grade is 'B' or greater.

## Degree Requirements

Graduate Certificate in Industrial Safety and Public Health requirements:

IE 604	Human Factors	3 cr.
EMGT 602	Engineering Crisis, Disaster, and Risk Management	3 cr.
EMGT 690	Special Topics in Engineering Management	3 cr.
EMGT 691	Special Topics in Engineering Management	3 cr.

**Subtotal: 12**

Subtotal: 12

Total Credit Hours: 12

## Graduate Certificate in Operations Research

Operations research is the application of advanced analytical methods to help make better decisions, by employing techniques that range from mathematical modeling, statistical analysis, and optimization. The goal is to identify optimal or near-optimal solutions to complex resource allocation and management problems. "OR" is the basis for solving many of the scheduling, distribution, staffing, and design problems in industry. This certificate is designed to be the analytic-oriented compliment to the Graduate Certificate in Operations Management (analytic-oriented).

The certificate consists of four 3-credit courses. Each course is in-class/online hybrid that enables students to participate either fully online, fully in-class, or any combination of the two. Course Credits earned are transferable to other graduate certificates as well as a future master's degree if: 1) transferred within 6 years, 2) grade is 'B' or greater.

## Degree Requirements

Graduate Certificate in Operations Research requirements:

EMGT 620/IE 620	Multi-Criteria Decision Analysis	3 cr.
EMGT 626/IE 626	Discrete Event Simulation	3 cr.
EMGT 635/IE 635	Operations Research	3 cr.
EMGT 643/IE 643	Design of Experiments	3 cr.

**Subtotal: 12**

Subtotal: 12

Total Credit Hours: 12

## Graduate Certificate in Risk and Emergency Management

Risk analysis and management are essential evaluation and planning tools for any organization with exposure to organizational, employee safety, and technical and natural hazards. Analyzing existing data, and developing anticipator assessments enables the private and public entity to save time, money, and the health and safety of employees and population by identifying hazard exposures such that each can be managed relative to the degree of risk that it represents. This graduate certificate enables the engineer, business leader, and civic planner to take the lead in managing and mitigating these types of risk exposures through hazard identification, qualification & quantification, scenario development, and preparations, as well as understanding the fundamentals of Emergency Response Planning at the city, state, and federal levels. For this, the four courses required for to earn the graduate certificate range from qualitative assessment of system exposure to hazards, to the quantitative analytic methods, and into the policy level decisions required to mitigate environmental hazards and emergency response planning.

The certificate consists of four 3-credit courses. Each course is in-class/online hybrid that enables students to participate fully online, fully in-class, or combination of the two. Course Credits earned are transferable to other graduate certificates as well as a future master's degree if: 1) transferred within 6 years, 2) grade is 'B' or greater.

## Degree Requirements

Graduate Certificate in Risk and Emergency Management requirements:

EMGT 602	Engineering Crisis, Disaster, and Risk Management	3 cr.
IE 614/EMGT 704	Engineering Risk Analysis Methods	3 cr.
EMGT 691	Special Topics in Engineering Management	3 cr.
EMGT 626/IE 626	Discrete Event Simulation	3 cr.

**Subtotal: 12**

Subtotal: 12

Total Credit Hours: 12

## Graduate Engineering Supply Chain Certificate

Companies are continuously working towards aligning their operations with supply chain management solutions. This certificate provides the theory, principles, and implications of supply chain management relevant for today's engineer. It is intended to provide students with an understanding of the strategic and tactical elements of supply chains. In particular this certificate is aimed for the engineer who is actively engaged in supply chain management and decision making.

The certificate consists of four, 3-credit courses.

## Degree Requirements

Engineering Supply Chain Certificate requirements:

EMGT 619/IE 619	Engineering Supply Chain	3 cr.
EMGT 645/IE 645	Quantitative Models of Supply Chain Management	3 cr.
EMGT 644/IE 644	Quality Systems and Process Improvement	3 cr.
EMGT 626/IE 626	Discrete Event Simulation	3 cr.

**Subtotal: 12**

Subtotal: 12

Total Credit Hours: 12

## Graduate Green Belt Certificate

The Green Belt Certificate Program is focused on creating a high performance organization through a mindset with continuous improvement at its core. This certificate provides the theory and principles to eliminate waste, reduce variability, and continually search for productive solutions in organizations. An equal balance of quantitative and qualitative tools and practices are introduced which are commonly applied by today's successful organizations. After completing this sequence of courses, students should feel qualified to sit for their six sigma black belt examination.

The certificate consists of four, 3-credit courses.

## Degree Requirements

Green Belt Certificate requirements:

EMGT 607	Quality Engineering	3 cr.
EMGT 615	Statistical Quality Control	3 cr.
EMGT 643/IE 643	Design of Experiments	3 cr.
EMGT 644/IE 644	Quality Systems and Process Improvement	3 cr.

**Subtotal: 12**

Subtotal: 12

Total Credit Hours: 12

## GRADUATE DEGREE AND PROFESSIONAL PROGRAM COURSES

Courses are listed alphabetically by prefix.

In the graduate engineering programs, the 500-level courses are open only to graduate students who have not taken the equivalent as part of their undergraduate program of study. Courses numbered 600 and above are open to all graduate students. As part of the engineering master's degree requirement, a minimum of five courses must be taken at the 600 level.

In the graduate business programs, the 500-level courses are pre-MBA courses. Courses numbered 600 and above are open only to graduate students who have successfully completed the related 500-level courses or received exemptions. Only 600-level courses may be used as electives in the graduate business programs.

### Notes

See Legend for Notes in Sequence of Courses

## AC - ACCOUNTING

### AC 610 - Cost-Based Decision-Making (3 cr.)

Prerequisite: AC 202 or AC 630, or their equivalent.

The objective of this course is to provide an Introduction to the aggregation of product costs, managerial control, performance evaluation, pricing, and contemporary topics such as the balanced scorecard. It builds on the technical skills developed in cost and managerial accounting courses, providing a real-world decision-making focus on the use of that information in a strategic business context. Outcomes include identification and application of cost allocation; target cost and cost-plus pricing; preparation and analysis of capital budgets; and an understanding of the issues associated with transfer pricing.

### AC 611 - Municipal and Fund Accounting (3 cr.)

Prerequisite: AC 101/HONB 203/AC 201 or its equivalent.

This course examines accounting concepts for nonprofit organizations. Key outcomes include an understanding of generally accepted accounting principles as they apply to governmental and municipal organizations, educational institutions, hospitals, and social organizations.

### AC 614 - Fundamentals of Corporate and Partnership Tax (3 cr.)

Prerequisite: AC 413 or its equivalent.

This course provides an introduction to the federal taxation of business entities. Key outcomes include an understanding of the fundamental concepts of the federal income taxation of corporate formations, earnings, and distributions, as well as the federal taxation of partnerships, S corporations, and other pass-through entities.

Formerly "Advanced Taxation of Business Entities"

### AC 620 - Advanced Topics in Auditing and Assurance Services (3 cr.)

Prerequisite: AC 419 or its equivalent.

This course examines the statements on auditing standards issued by the AICPA and PCAOB. Key outcomes include an understanding of

the effects of standards on audit reports, and current issues in auditing. Extensive use is made of case analysis.

### AC 621 - Advanced Financial Accounting (3 cr.)

Prerequisite: AC 306 or the equivalent

This course is the third in a three-course sequence offering an in-depth examination of financial reporting issues. The focus of this course is on accounting principles and practice related to business combinations as well as multinational accounting. Key outcomes include an understanding of intercorporate investments, business combinations, consolidated financial statements, intercompany transfers of assets, foreign currency transactions, and translation of foreign entity financial statements.

### AC 622 - Accounting Theory & Contemp Issues (3 cr.)

Prerequisite: AC 306 or the equivalent

This course examines financial accounting theory on which basic U.S. generally accepted accounting principles (GAAP) and practice are based. Students will be expected to develop an understanding of internal and external forces that impact accounting policies, how controversies regarding accounting policies are resolved, and how standards are promulgated. This course also examines International Financial Reporting Standards (IFRS), which are the generally accepted principles used in many other countries, as well as the status of the convergence of U.S. GAAP and IFRS.

### AC 630 - Accounting for Decision Makers (3 cr.)

Prerequisite: AC 101/HONB 203/AC 201 or its equivalent, and a familiarity with computer-based spreadsheets, and Graduate Standing.

This course is directed to the general MBA student and focuses on the accounting information needed to operate effectively in a competitive business environment. It explores the use of such information for planning, controlling, decision-making, and evaluating performance. It integrates the traditionally separate functions of accounting and management for the successful operation of the business entity. Key outcomes include the ability to identify relevant costs for decision making, and to apply standard costing, cost-volume-profit analysis, budgeting, activity-based cost/management, transfer pricing, and performance measurement in decentralized organizations. Quantitative tools, such as regression, are utilized for analysis.

Cannot be taken by Master of Science in Accounting students.

### AC 633 - Independent Study (3 cr.)

Prerequisite: Permission of the instructor.

Provides an opportunity to conduct research in an area of a student's own specific interest. An independent study must be taken with the approval of the Master of Science in Accounting Program Director. Submission of a formal proposal is required before such approval will be granted. The expected outcome of an independent study is a paper of a quality that could be presented at a professional conference or submitted for journal publication. This course will carry three credits and may not be repeated.

### AC 641 - Fraud Examination (3 cr.)

Prerequisite: AC 101/HONB 203/AC 201 or equivalent



This course examines the different aspects of fraud: what it is, the types of people more likely to commit it, how to fight and prevent it, how to recognize and be able to detect its symptoms, and how to investigate it. Methods of fraud inquiry and interviewing are also covered. Key outcomes include the ability to understand the above topics covered.

Formerly "Introduction to Fraud"

### **AC 642 - Forensic Accounting (3 cr.)**

Prerequisite: AC 306

This course focuses on accounting and legal fundamentals for forensic accounting. Key outcomes include the ability to understand computer-aided data analysis techniques for detecting and investigating fraud cases, issues related to the collection and use of digital evidence, and collection of data from electronic devices.

### **AC 646 - Selected Topics in Taxation (3 cr.)**

Prerequisite: AC 313

This course provides a continuation of taxation concepts beyond the core. Key outcomes include an understanding of selected topics pertaining to taxation and tax planning for individuals, entities, trusts, estates, and tax-exempt organizations, as well as assets transactions, accounting methods, multijurisdictional issues, and personal financial advisory services.

### **AC 650 - Financial Accounting (3 cr.)**

Prerequisite: AC 101/HONB 203/AC 201 or equivalent

This course is for MBA students who want to improve their understanding of financial statements and the information they contain. Topics examined include the relevance of financial accounting for MBA students, preparation of financial statements, analysis of various financial statement elements and the impact managerial choices have on items reported in financial statements. Key outcomes include the ability to prepare and analyze financial statements, ratio analysis, and different methods of accounting for transactions.

Cannot be taken by Master of Science in Accounting majors.

### **AC 680 - Accounting Internship (3 cr.)**

The accounting internship is an opportunity for students to apply accounting theory in real world situations. Research is an integral part of this experience. Expected outcomes include the ability to identify and define a problem, undertake research to determine the context of the problem, and to select and apply the appropriate theory toward its resolution.

### **AC 690-694 - Special Topics in Accounting (3 cr.)**

This is a study of advanced topics in accounting of special interest to accounting majors, but not carried in the catalog on a regular basis. The course may be repeated for credit if the topic varies.

## **BIS - BUSINESS INFORMATION SYSTEMS**

### **BIS 610 - Information Technology Management and Applications (3 cr.)**

Prerequisite: Graduate standing

This course presents current issues and development trends in utilization and management of information systems in organizations. It examines and explores new paradigms for computer application development and systems design. This course also discusses the impact of information systems and technology on organization structure, strategy, and operations. A variety of computer applications will be introduced. Topics will be selected from spreadsheet modeling, database management, knowledge acquisition and management, data modeling, and E-commerce.

### **BIS 620 - Decision Modeling for Analytics (3 cr.)**

Prerequisite: BIS 221, IE 221, MATH 120 or MATH 121, or equivalent, and Graduate Standing - must be completed prior to taking this course.

This course introduces spreadsheet-based management science models for business analytics. Key learning outcomes include enhanced skills in spreadsheet applications, business problem interpretation, mathematical nature of models, model building and application in spreadsheets, interpretation of model results, and decision making. Data Mining Algorithms covered include: Regression Modeling, Decision trees, Time Series, Cluster Analysis and Association Analysis.

Formerly "Decision Support Models"

### **BIS 633 - Independent Study in Business Information Systems (3 cr.)**

See "Independent Study".

Laboratory fees may be required.

### **BIS 635 - Enterprise Analytics with SAP (3 cr.)**

Prerequisite: BIS 610 and Graduate standing.

This course introduces students to business analytics using modern commercial and open-source analytics tools. The course provides an overview of the processes, methodologies, infrastructure, and current practices used to transform business data into useful information that supports business decision-making. Business analytics requires foundation knowledge in data storage and retrieval, thus, this course will review logical data models for both database management systems and data warehouses. This course will introduce data warehousing concepts and definitions, together with text mining concepts and techniques. The course will use the SAP Business Warehouse (BW) server, SAP Lumira, SAP Predictive Analytics, and other SAP analytics tools.

### **BIS 690 - Special Topics in Business Information Systems (3 cr.)**

Prerequisite: Graduate standing in BIS or permission of the instructor.

Topics offered depend upon student interests as well as particular interests of instructors. This course is offered as often as faculty time and student interest permit and may be repeated for credit if the topic differs.

Laboratory fees may be required.

## **BL - BUSINESS LAW**

### **BL 621 - Law and The Business Entity (3 cr.)**

This course surveys the law as it applies to business. Key learning outcomes focus on: the legal system; "white collar" crime analysis of employment law; analysis of the business entity; property law; and the protection of ideas and processes (intellectual property).

### **BL 640 - Business Law (3 cr.)**

Prerequisite: BL 201 and Fourth-Year status, or Graduate status

This course focuses on law in the business context. Key outcomes include the ability to understand contract requirements and breach, the Uniform Commercial Code, agency law, and legal issues pertaining to choice of entity.

Formerly Law for Accountants

### **BL 690 - Special Topics in Business Law (3 cr.)**

This is a study of advanced topics in business law.

## **BUS - BUSINESS**

### **BUS 610 - Business and Its Environment (3 cr.)**

Prerequisite: Graduate standing.

Cross-Listed as: MAN 611

This course examines the social, economic, and political environment facing business and its leaders in the 21st century. Coverage includes the economic dynamics of the global marketplace, demographic trends and their impact on the organization, public policy and regulatory issues, the relationship between business and governments, and the nature of business ethics and corporate social responsibility. The goal of this course is to enhance students' ability to meet multifaceted challenges facing managers in the business environment.

Offered: MR

Must be MBA, MBASP, MSA, MSATX, or MSAFF student.

### **BUS 675 - Graduate Business Internship (3 cr.)**

Prerequisite: MBA student with nine credits or less, or permission of MBA director.

The graduate business internship is an opportunity for students to apply theories and principles of the business disciplines in a workplace setting. The student will work with a faculty advisor to establish specific internship learning outcomes.

### **BUS 680 - Strategic Management (3 cr.)**

Prerequisite: AC 630, BUS 610, FIN 630, MAN 610, MK 640, and BIS 620.

This course focuses on strategic level analysis of the firm. Key learning outcomes include: the application of corporate and business strategies through environmental analyses based on economic, political, legal, social, global, and internal organizational factors; decision making based on the firm's strategic performance using financial statements, stakeholders satisfaction, and investment decisions; the application and use of functional strategies in implementing corporate and business level strategies; and decision-making based on micro and macro environmental factors influencing the strategic management process. The course makes wide use of case studies in achieving the course objectives.

Must be MBA major.

### **BUS 690-692 - Special Topics in Business (3 cr.)**

This is a study of advanced topics in business of special interest to business majors, but not offered on a regular basis.

Distribution: MR

## **CEE - CIVIL AND ENVIRONMENTAL ENGINEERING**

### **CEE 590 - 595 - Special Topics in Civil Engineering (3 cr.)**

Prerequisite: Graduate MSCEE standing and/or 5th Year BS/MS

This is a study of an advanced topic in engineering of special interest to civil engineering majors, but not carried in the catalogue on a regular basis.

### **CEE 602 - Finite Element and Numerical Analysis (3 cr.)**

Prerequisite: Graduate MSCE or MSCMGT standing.

Shape functions, isoparametric formulation, plates and shells elements, elements assembly, convergence, programming, computational modeling, finite difference, numerical methods, error, probability and statistics.

### **CEE 606 - Advanced Green and Sustainable Civil Engineering (3 cr.)**

Prerequisite: Graduate MSCE standing.

Solar, wind, geothermal, hydro energy, biofuels, energy balance, sustainable construction and transportation materials, climate change, carbon footprint analysis, entrepreneurship.

### **CEE 609 - Engineering Cost Analysis (3 cr.)**

Prerequisite: Graduate MSCE or MSCMGT standing.

Cross-Listed as: EMGT 609 and IE 609

This is a study of the economic aspects of engineering decisions. Topics include comparison of alternatives in engineering programs and economic factors in selecting and replacing machinery, equipment, and structure.

Cannot take IE 609 and EMGT 609 for credit

### **CEE 620 - Subsurface Contaminant Fate and Transport and Remediation (3 cr.)**

Prerequisite: Graduate MSCE standing.

Solute transport, advection, diffusion, dispersion, groundwater chemistry, vadose zone hydrology, contamination, remediation methods, mathematical and numerical analysis.

### **CEE 630 - Advanced Geotechnical Engineering (3 cr.)**

Prerequisite: Graduate MSCE standing.

Shallow and deep foundations design, earth retaining structures, site investigation methods, in-situ tests, parameters selection and estimation, soil improvement.

**CEE 640 - Solid Mechanics (3 cr.)**

Prerequisite: Graduate MSCE standing.

Elastic deformable bodies, kinematics, balance laws, constitutive equations, small-deformation theory, boundary-value problems, variational formulations, minimum principles.

**CEE 641 - Energy Management (3 cr.)**

Prerequisite: CEE 609 or equivalent

Cross-Listed as: EMGT 640

This is an examination of energy cost and its impact on technical and management approaches to conservation programs. Topics include energy reduction in electrical and thermal systems; heating, ventilation, and air conditioning systems; and methods of initiating and managing an effective conservation program.

Cannot take CEE 641 and EMGT 640 for credit.

**CEE 642 - Advanced Reinforced Concrete Design (3 cr.)**

Prerequisite: Graduate MSCE standing.

Indeterminate reinforced concrete structures, flat slabs, two-way slabs, yield line method, design of reinforced concrete beams, columns, and footings, fire resistance, seismic analysis.

**CEE 644 - Structural Dynamics and Earthquake Engineering (3 cr.)**

Prerequisite: Graduate MSCE standing.

Dynamic load analysis, foundation excitation, single-degree-of-freedom systems, multi-degree-of-freedom systems, spectral analysis, design of seismic resistant structures, simple inelastic structural systems.

**CEE 650 - Advanced Railway Engineering and Planning (3 cr.)**

Prerequisite: Graduate MSCE standing.

High speed rail technologies, corridor and land-use planning, forecasting, noise and vibration, advanced track design, risk assessment, environmental and social impacts, international perspectives.

**CEE 670 - Construction Management (3 cr.)**

Prerequisite: Graduate MSCE or MSCMGT standing.

Construction history, bid package, estimation, project reduction, contracts, legal matters, project planning, scheduling, financial and cost control, labor issues, equipment management, safety.

**CEE 671 - AI: Machine Learning - Concepts (3 cr.)**

Prerequisite: Graduate standing

Cross-Listed as: ME 671, EE 671, CPE 671, IE 671

This course focuses on AI concepts such as Data Exploration, Single and Multivariate Parametric and Non-Parametric methods of regression and classification tasks. Students will learn the theory that underlies these algorithms and implement them using popular machine learning packages such as Python with scikit-learn and MATLAB. During the final project, students will implement multiple algorithms and learn how to select the best algorithm with the optimized hyperparameters.

**CEE 672 - Material Selection, Cost Estimation, and Bidding (3 cr.)**

Prerequisite: Graduate standing

This course will include construction materials selection, sustainability and environmental impacts, renewable energy for buildings, material life cycle analysis, cost estimation, bidding procedures, and contracts.

**CEE 673 - AI: Applied Neural Networks and Machine Learning (3 cr.)**

Prerequisite: Graduate standing

Cross-Listed as: CPE 673, ME 670, IE 670, EE 670

This course concentrates on application of neural networks in the field of engineering. In this course students will learn vision-based applications of Perceptron algorithm as well as back propagation. Linearly and nonlinearly separable clustering and classification problems will be covered. This course is project based and concentrates on the latest applied Neural Networks and Machine Learning algorithms. All concepts are heavily reinforced using MATLAB, the main computational platform.

Formerly "Optimal Control Systems"

**CEE 674 - AI: Machine Learning - Applications (3 cr.)**

Prerequisite: Graduate standing

Cross-Listed as: CPE 672/ME 672/EE 672/IE 672

This course focuses on Artificial Intelligence application packages such as Data exploration, Natural Language Processing, Support Vector Machine, Reinforcement Learning, Artificial Neural Networks (ANNs) and Computer Vision and Deep Learning.

Students will learn the theory and applications of a variety of algorithms. These algorithms will be implemented using Python and MATLAB software. As the final project, students will apply a combination of algorithms to a specific application and develop an end to end solution.

### **CEE 676 - AI: Applied Fuzzy Logic (3 cr.)**

Prerequisite: Graduate standing

This course covers the fundamentals of fuzzy logic theory and its applications. In this course students will learn to analyze crisp and fuzzy sets, fuzzy propositional calculus, predicate logic, fuzzy logic, fuzzy rule-based expert systems, and will learn to apply fuzzy logic theory to a variety of practical applications. Students will also learn to use MATLAB computational software to understand new concepts and to perform and implement fuzzy logic rules and systems. Machine Controls will be the application.

Formerly "Intelligent Motion Controls"

### **CEE 680 - Civil Engineering Project (3 cr.)**

Prerequisite: Graduate MSCE standing.

Students must select a project faculty adviser and obtain topic approval prior to registration for this course. This is an independent engineering project under the supervision of a project faculty advisor. The design process is emphasized. Progress reports and a final written report are required. An oral presentation and defense of the project is made before a faculty committee.

Course may be repeated 3 times.

### **CEE 690 - Special Topics in Civil Engineering (3 cr.)**

Prerequisite: Graduate MSCE standing.

This is a study of an advanced topic in engineering of special interest to civil engineering majors, but not carried in the catalogue on a regular basis.

### **CEE 691 - Special Topics in Civil Engineering (3 cr.)**

Prerequisite: Graduate MSCE standing.

This is a study of an advanced topic in engineering of special interest to civil engineering majors, but not carried in the catalogue on a regular basis.

### **CEE 698 - Thesis Research (3 cr.)**

Prerequisite: Graduate MSCE standing.

This is a research course open to civil engineering graduate students who have completed requirements for admission to candidacy for the master's degree. Prior to registration, written permission to enroll must be obtained from the student's advisor.

### **CEE 699 - Thesis Research (3 cr.)**

Prerequisite: Graduate MSCE standing.

This is a research course open to civil engineering graduate students who have completed requirements for admission to candidacy for the master's degree. Prior to registration, written permission to enroll must be obtained from the student's advisor.

## **CPE - COMPUTER ENGINEERING**

### **CPE 520 - Computer Architecture (3 cr.)**

Prerequisite: CPE 310

Cross-Listed as: CPE 420

This is a senior level course in the theory and design of modern computer architectures. Students learn the fundamental organization of processors, controllers, memory, and communication links as well as the issues involved with internal data representation. Students will understand the close correlation between registers, bus interconnections, and instruction sets. Students gain skills in computer performance prediction by analyzing advanced features including instruction pipelines, arithmetic circuits or co-processors, cache, and virtual memory. After successfully completing this course students understand the issues involved with instruction set design and implementation and are able to evaluate new architectures. The methods of assessing student learning in the course are homework assignments, a term project, and exams.

Distribution: MR

### **CPE 522 - Internet of Things (IoT) (3 cr.)**

Prerequisite: A programming language (e.g. C/C++), and CPE senior standing or EE senior standing.

Cross-Listed as: CPE 422

This introductory course covers the basic building blocks of the Internet of Things (IoT) and develops the necessary skills required to design and implement products and services. Students learn to develop applications under the Linux operating system, interface circuits and sensors, develop scripts to process data, use IoT programming tools, and leverage web technologies for remote monitoring and control of electronic devices using the Internet. The roles of cybersecurity, machine learning and data analytics in IoT systems are discussed. Through hands-on projects, students design and build IoT systems for sensing, processing, actuation, and wireless communication using mobile single-board computers.

### **CPE 525 - Software Engineering (3 cr.)**

Prerequisite: A structured programming language.

Cross-Listed as: CPE 425

This is a first year graduate course in software system design fundamentals. Students learn the approaches to designing medium to

large-scale systems. After completing this course, students understand lifecycle issues in modern software design. They learn a variety of software design methodologies including structured design, top down design, bottom up design, and incremental design and are introduced to object oriented design. Students participate in a semester-long team project with design documentation delivered and presented at specified design review milestones. The methods of assessing student learning in the course are homework assignments, a research paper, and a semester long design project that culminates in a formal presentation.

### **CPE 562 - VHDL: Simulation and Synthesis (3 cr.)**

Prerequisite: CPE 271 or equivalent.

Cross-Listed as: CPE 462

This project-oriented course covers the design of digital systems using VHSIC Hardware Description Language (VHDL), synthesizing the design, and mapping it onto hardware (Altera DE2-115 Field Programmable Gate Arrays (FPGA) boards). Students learn VHDL language to describe digital circuits and to write test bench for those descriptions for design verification. Students can distinguish synthesis coding versus simulation coding. Students will learn different coding styles, such as structural, data flow, and behavioral coding styles, as well as identify the differences. Students will use functions, procedures, components and generics to describe hardware. Students also acquire the skills to use Altera Quartus synthesis tools as well as the Altera Edition of the MultiSim simulator. The course provides a solid foundation for advanced work.

### **CPE 585 - Computer Networks (3 cr.)**

Prerequisite: ENGR 212 or IE 212 or equivalent.

Cross-Listed as: CPE 485

This is a first course on communication networks. After completing this course, students understand the structure and issues of network design using the ISO Seven Layer model as a reference. They understand the limitations placed on specific network architectures from the physical (hardware) layer up through the upper layers (transport). The problems of error detection and recovery are also discussed. Students learn to use delay models to predict network specific performance measures and understand the limitations of these models. The course covers issues associated with routing and flow control. The methods of assessing student learning in the course are homework assignments, quizzes, three exams, and research paper with a formal presentation.

### **CPE 590-591 - Special Topics in Computer Engineering (1-3 cr.)**

Prerequisite: Graduate standing

Topics offered depend on student interests as well as particular interests of instructors. This course may be repeated for credit if the topic varies.

### **CPE 601 - Probabilistic Models for Digital Systems (3 cr.)**

This course is designed to provide students with the necessary fundamental concepts and mathematical tools to conduct performance analysis. These methods are used to describe random processes and queuing theory and their application to such areas as computer hardware and software performance, scheduling, and stochastic machines. Both analytical models and simulation models are considered. Topics covered include basic probability theory review, random variables, and transform theory.

Also more advanced topics such as Markov models, single queue models, and queuing networks are introduced. Several case studies shall be conducted throughout the course. The primary methods of assessing student learning are homework assignments, quizzes, exams, and a term project.

### **CPE 620 - Advanced Computer Architecture (3 cr.)**

Prerequisite: CPE 420 or permission of instructor.

This is an advanced study of computer architecture. Topics may include stack computers, pipeline computers, parallel computers, micro-programming, performance evaluation, and distributed processing.

### **CPE 625 - Advanced Software Engineering (3 cr.)**

Prerequisite: CPE 425 or equivalent.

This course introduces advanced topics in software system design, construction, and maintenance. Students learn about approaches to incorporating new features in legacy systems, as well as reverse engineering in systems lacking sufficient documentation. The use of components is stressed as a means of isolating and extending existing systems. Students participate in a semester long team project.

### **CPE 635 - Advanced Requirements Analysis (3 cr.)**

Prerequisite: CPE 435 or equivalent.

This class examines advanced topics associated with system requirements. Approaches to automated requirements writing are explored. Approaches to formal methods used in specifying requirement are studied. Automated approaches to verifying, validating, and detecting ambiguity, as well as implementing requirements in delivered software are examined. Models employed in requirements engineering will be examined.

### **CPE 645 - Embedded Software Systems (3 cr.)**

Prerequisite: CPE 442 or equivalent and CPE 601 or equivalent.

Students learn modern methods, techniques, and tools for the specification, design, and implementation of real-time embedded systems. Students are given an overview of various platforms and automated tools for developing software for embedded systems. Processes used in the development of systems with real-time performance are introduced. Issues associated with real-time debugging are introduced.

### **CPE 648 - Software Project Management (3 cr.)**

Prerequisite: CPE 435 or equivalent.

Students learn about the issues associated with managing a software project. Students learn about the importance of establishing project scope and eliciting requirements. A detailed analysis of project planning will be conducted with emphasis on planning, estimating, scheduling, risk analysis, tracking, and control. Various approaches to managing software projects will be studied at the critical level.

### **CPE 650 - Software Architecture (3 cr.)**

Prerequisite: CPE 425 or equivalent and CPE 601 or equivalent.

This course introduces students to architectural design. Students learn how to structure data and components in order to satisfy requirements of a design. Students learn about architectural styles that a solution may utilize. Students also study the structure and interrelationships among the architectural components. Alternative solutions are considered and evaluated. The role of architecture as a facilitator for

communication between designers and stakeholders is emphasized. Metrics to assess architectural quality are introduced.

**CPE 652 - Software Generation and Maintenance (3 cr.)**

Prerequisite: CPE 425 or equivalent and EE 601 or equivalent.

Students learn effective approaches to designing systems that are easier to maintain after their initial release. Maintenance accounts for some 70 percent of a software system's life cycle. Designing new maintainable software systems is as important as dealing with existing legacy systems. Students are introduced to writing reusable software components, automatic code, and application generators, as well as their limitations, regression analysis, and reverse engineering.

**CPE 655 - Computer Network Architecture (3 cr.)**

Prerequisite: Graduate standing.

This is a comprehensive study of the way computer networks are designed and operated focusing on basic principles that guide the development of computer networks, e.g., management of complexity, standardization of connectivity, and resource sharing. Seven textual models such as IEEE 802, DOD, TOP, MAP, and ISDN are briefly covered.

**CPE 671 - AI: Machine Learning - Concepts (3 cr.)**

Prerequisite: Graduate standing

Cross-Listed as: CEE 671/ME 671/EE 671/IE 671

This course focuses on AI concepts such as Data Exploration, Single and Multivariate Parametric and Non-Parametric methods of regression and classification tasks. Students will learn the theory that underlies these algorithms and implement them using popular machine learning packages such as Python with scikit-learn and MATLAB. During the final project, students will implement multiple algorithms and learn how to select the best algorithm with the optimized hyperparameters.

**CPE 672 - AI: Machine Learning - Applications (3 cr.)**

Prerequisite: Graduate standing

Cross-Listed as: CEE 674/ME 672/EE 672/IE 672

This course focuses on Artificial Intelligence application packages such as Data exploration, Natural Language Processing, Support Vector Machine, Reinforcement Learning, Artificial Neural Networks (ANNs) and Computer Vision and Deep Learning. Students will learn the theory and applications of a variety of algorithms. These algorithms will be implemented using Python and MATLAB software. As the final project, students will apply a combination of algorithms to a specific application and develop an end to end solution.

**CPE 673 - AI: Applied Neural Networks and Machine Learning (3 cr.)**

Prerequisite: Graduate standing

Cross-Listed as: EE 670, ME 670, IE 670, CEE 673

This course concentrates on application of neural networks in the field of engineering. In this course students will learn vision-based applications of Perceptron algorithm as well as back propagation. Linearly and nonlinearly separable clustering and classification problems will be covered. This course is project based and concentrates on the latest applied Neural Networks and Machine Learning algorithms. All concepts are heavily reinforced using MATLAB, the main computational platform.

Formerly "Optimal Control Systems"

**CPE 674 - AI: Applied Fuzzy Logic (3 cr.)**

Prerequisite: Graduate standing

Cross-Listed as: EE 676, ME 676, IE 676, CEE 676

This course covers the fundamentals of fuzzy logic theory and its applications. In this course students will learn to analyze crisp and fuzzy sets, fuzzy propositional calculus, predicate logic, fuzzy logic, fuzzy rule-based expert systems, and will learn to apply fuzzy logic theory to a variety of practical applications. Students will also learn to use MATLAB computational software to understand new concepts and to perform and implement fuzzy logic rules and systems. Machine Controls will be the application.

Formerly "Intelligent Motion Controls"

**CPE 690 - Special Topics in Computer Engineering (3 cr.)**

This is a study of an advanced topic in engineering of special interest to computer engineering majors, but not carried in the catalogue on a regular basis.

**ED - EDUCATION**

**ED 510 - Educational Research (3 cr.)**

Prerequisite: Graduate standing.

This course provides an overview of the salient aspects of educational research. The techniques of conceptualizing and conducting qualitative and quantitative research methodologies will be treated. Students will examine the strengths and weaknesses of different methodologies used in research. A main focus of the course is to help students read, understand, critique, and use published reports of research to design and present an original research project relevant to the student's field. Students will be assessed on collaborative participation measures, examinations, and individual research projects.

**ED 515 - Assessment: Theories, Strategies, and Design (3 cr.)**

Prerequisite: Graduate standing.

This course is designed to provide in-service teachers with learning theories (constructivism, learning styles, multiple intelligences, and brain-compatible learning) as a foundation for broadening their classroom assessment repertoire. Authentic models of assessment will be compared to more traditional formats, and rubric design will be explored. Current issues in assessment will also be a focus of study and discussion in this class.

**ED 520 - Administrative Skills and Mentoring (3 cr.)**

Prerequisite: Graduate standing.

The purpose of this course is to train educators in a range of interpersonal and group process skills that can be utilized in educational organizations. Students will learn techniques for the mentoring relationship, with a focus on the skills that can help nurture another's personal and professional development, and with attention to the professional assessment process introduced by Massachusetts Department of Elementary and Secondary Education regulations. Students will also explore ways to build better working relationships among peers, learn group analysis and facilitation techniques, negotiation skills, and team-building techniques.

### **ED 525 - Adult and Professional Development (3 cr.)**

Prerequisite: Graduate standing.

This course examines key elements of adult development and socialization as they relate to an individual's professional life and growth during the early adulthood and middle adulthood periods. A range of developmental perspectives are considered, including the ways adults make meaning intellectually, psychologically, ethically, and socially. Interpersonal relations are examined, as well as issues of gender, ethnicity, and socioeconomic status. Students will be assessed by examinations and written assignments.

### **ED 530 - Philosophy of Education (3 cr.)**

Prerequisite: Graduate standing.

This course is designed to provide an introduction to some of the major philosophical approaches to education, including theories of multicultural education. While exploring a number of schools of philosophy and their implications for education, students will be encouraged to examine each approach in terms of their own experiences. Critical thinking and clarification of a personal philosophy of education are fundamental to the course. Students will analyze the social and cultural elements that have had an impact on education in the modern world, including issues of ethnicity, socioeconomic status, gender, and religion. The conservative and dynamic functions of education will also be considered. Students will be assessed by examinations, class presentations, and written assignments.

### **ED 533 - Independent Study in Education (3 cr.)**

Prerequisite: Graduate standing.

### **ED 535 - Technology Education and Integration in the Elementary Classroom (3 cr.)**

Prerequisite: Graduate standing.

Technology Education and Integration in the Elementary Classroom is a course designed to provide an in-depth analysis of technology uses in the K-6 educational setting. This course will entail telecommunications, computer software, multimedia technologies, and microcomputer technologies, and their use in teaching and learning. Upon completion of the course, students will be able to demonstrate technology uses for classroom instruction, management, and enrichment through all technology mediums, create uses for technology in all facets of the curriculum, and demonstrate technology uses for special needs students.

### **ED 540 - Mathematical Theories and Skills for Elementary Teachers (3 cr.)**

Prerequisite: Graduate standing.

This course focuses on the skills and theory in mathematics within the context of problem-solving, communication, connections, and reasoning. Different methodologies will be incorporated, including manipulatives, technology, children's literature, and journaling. Student performance will be assessed by written assignments and projects.

### **ED 545 - Concepts and Methods of Natural Sciences (3 cr.)**

Prerequisite: Graduate standing.

Open only to students in MEEE program. This course examines the principle ideas and theories of the natural sciences. It begins with an introduction to the approach used by the natural sciences to study the universe, the scientific method. Eight major ideas in the natural sciences: the basic laws of physics governing forces and motion, atomic and kinetic theory, the big bang theory of the origin of the universe, patterns of chemical change and the periodic table, the structure of the earth and plate tectonics, biological evolution, the unity of all living things from cells to ecosystems, and DNA structure and function are then examined in the context of their historical development and the scientific method. Finally, the interaction between science and the real world through technology will be explored and the method of benefit/risk analysis will be introduced. Laboratory experiments, group work, and problem solving will be emphasized.

Formerly CHEM 515

### **ED 550 - Strategic Teaching in Reading and Language Arts (3 cr.)**

Prerequisite: Graduate standing.

In this course students will develop a repertoire of effective strategies to assess and support language arts learning for elementary aged learners, especially those struggling to meet grade level expectations. Participants will practice using a variety of assessments, analyzing data and matching assessment data to lessons that most strategically facilitate students' literacy skill development. Attention will be given to cultural, cognitive, and linguistic factors that impact literacy learning.

### **ED 601 - Research for Teachers (3 cr.)**

This course will provide students with an overview on reading, critiquing and conducting educational research. The techniques of designing and conducting both qualitative and quantitative research methodologies will be studied and applied. Students will examine the strengths and weaknesses of different methodologies used in conducting and presenting educational research. Students will design, conduct and present an original research project relevant to the field of education.

### **ED 602 - Principles of Differentiating Instruction (3 cr.)**

After defining the concept of differentiation, this course will focus on developing a model for differentiating instruction. Students will identify reasons for differentiating instruction; examine which aspects of curriculum should be differentiated, and develop criteria for determining fairness and effectiveness of differentiated instruction for all learners.

### **ED 603 - Contemporary Learning Theories (3 cr.)**

This course is designed to engage students in studying learning theory as a foundation for understanding the teaching/learning

process. Contemporary theory including: constructivism, learning styles, multiple intelligences, and brain-compatible learning, as well as more traditional theory such as behaviorism will be examined.

#### **ED 604 - Mentoring and Professional Development (3 cr.)**

The purpose of this course is to examine approaches to mentoring and other forms of professional development that are utilized in educational organizations. Students will learn techniques of clinical supervision (data collection, constructive feedback...), strategies for initiating and sustaining a mentoring relationship, and other skills that support induction to the profession of teaching. Students will also explore effective resources and approaches.

#### **ED 605 - Designing Culturally Sustaining Pedagogy (3 cr.)**

This course is designed to engage students in exploring the philosophical, historical, and theoretical foundations of multicultural/multilingual teaching and learning. Students will learn to develop curriculum and other instructional strategies that are responsive to racial, cultural, linguistic, and social class differences that facilitate learning for all learners. Coursework will also investigate and apply a social justice perspective to the teaching/learning process.

Formerly "Multicultural Education"

#### **ED 606 - Assessment Theory and Design (3 cr.)**

This course is designed to provide as a foundation for broadening students' classroom assessment repertoire. Authentic models of assessment will be compared to more traditional formats; summative and formative assessment strategies will be examined. Students will learn to critique benefits and drawbacks of available assessment tools, as well as design their own. Current issues in assessment will also be a focus of study and discussion in this class.

#### **ED 610 - Literacy Strategies for Struggling Readers (3 cr.)**

In this course students will learn how to collect and analyze student data during literacy events. They will build a repertoire of strategies for fostering and strengthening children's abilities to fully participate in the processes of communicating and meaning making that fluent reading requires. Students will also examine cognitive, linguistic, and cultural impacts on the literacy learning process.

#### **ED 611 - Integrating Curriculum through Children's Literature (3 cr.)**

This course focuses on identifying quality children's literature to use in classroom settings from both a literary and issues approach. Students will develop a repertoire of strategies for using quality children's literature throughout the curriculum (e.g. math, science, social studies) and will learn to read children's literature with a content learning lens. Students will also practice creating lessons that effectively use literature to support and deepen content area learning.

#### **ED 612 - Infusing Content Areas with Art-Elementary (3 cr.)**

In this course students will develop a repertoire of activities that they can integrate into the elementary class curriculum allowing their students to experience art as another way to see, represent, and interpret the world around them; another language in which to express their thoughts, ideas, and feelings. Students will also

experience ways to incorporate the purposes of art in societies, the contributions of various artists, and interpretation of art to meet content area objectives.

#### **ED 613 - Deepening Mathematical Content Knowledge (3 cr.)**

This course focuses on the concepts and skills key to the elementary mathematics curriculum. Students will engage in activities that will strengthen their own conceptual and factual mathematical knowledge. They will also practice designing lesson plans and assessment tools that effectively support and monitor development of students' mathematical understandings.

#### **ED 614 - Reading and Writing in the Content Areas (3 cr.)**

This course will engage students in reviewing content area learning objectives identified by local, state, and national organizations. Students will then learn about and apply literacy best practices (primarily reading and writing, but other language arts will also be addressed) that best support students' achievement in meeting content area objectives.

#### **ED 615 - Ethics in Educational Practice (3 cr.)**

The focus of this course is contemporary issues in education, especially those involving adolescents and young adults, teacher employment, and curriculum decisions. Using a case study approach students will learn about school law, applied ethics, and educational policy.

#### **ED 616 - Adolescent Literacy and Young Adult Literature (3 cr.)**

This course is designed to support students in examining the unique needs of the adolescent literacy learner. Students will develop a repertoire of criteria for selecting appropriate literature for adolescents using both a literary and issues approach. Students will practice integrating literacy strategies and objectives with themes and issues present in selected young adult literature.

#### **ED 617 - Infusing Content Areas with Art-Secondary (3 cr.)**

In this course students will develop a repertoire of activities that they can integrate into the curriculum allowing their students to experience art as another way to see, represent, and interpret the world around them; another language in which to express their thoughts, ideas, and feelings. Students will also identify ways to incorporate the purposes of art in societies, the contributions of various artists, and interpretation of art in to meet content area objectives. Identification of characteristic features of art works from various historical periods, cultures, and genres that can be incorporated in their content area will be another focus of course content.

#### **ED 633 - Independent Study in Education (3 cr.)**

Prerequisite: Graduate Standing.

#### **EE - ELECTRICAL ENGINEERING**

#### **EE 514 - Microwave Engineering (3 cr.)**

Prerequisite: EE 314 or equivalent.

Cross-Listed as: EE 414



Fundamentals of modern microwave engineering with emphasis on microwave network analysis and circuit design. Microwave transmission lines, including waveguide, coax, microstrip, and stripline. Microwave circuit theory, including S-parameters, ABCD matrices, equivalent circuits, and signal flow graphs. Upon completion of this class the student will be able to analyze and design passive microwave circuits and components such as matching networks and microwave resonators, power dividers, directional couplers, and filters. Modern RF & microwave CAD such as ANSYS HFSS, ANSYS DesignerRF, Advanced Design System (ADS), and MATLAB will be used to emphasize and to help in understanding important concepts of the course. The primary methods of assessing student learning are homework assignments, exams and design projects.

### **EE 523 - Communications (3 cr.)**

Prerequisite: EE 302 and EE 320 This is a course in electronic (analog and digital) communication fundamentals.

Cross-Listed as: EE 423

After successfully completing this course students know what analog and digital signaling methods (PAM, PCM, AM, PM, and FM) are available; know how to model, analyze, and design a basic communication link; know how to model, analyze, and design signals that go with the various signaling methods (including the theories on information measure, signal types and their measure, encoding schemes and Fourier analysis); are familiar with the various types of modulation and demodulation schemes available and are familiar with some of the practical applications of modulation/demodulation theory. The methods of assessing student learning in this course are homework assignments, quizzes, classroom discussions, a research project, and a final exam.

Distribution: MR

### **EE 525 - Linear Systems Theory (3 cr.)**

Prerequisite: EE 301 or concurrently

Cross-Listed as: EE 425

Students learn the fundamentals of the state space approach to systems modeling, analysis, and design. They also learn how to find the state space model of electrical, mechanical, and electromechanical systems. In addition students learn how to represent a system in the Jordan, first canonical, and phase variable forms, and to apply state space techniques to find zero input, zero state, and complete solution from state space system equations. In addition students learn to perform system stability, controllability, and observability tests and to design state and output feedback techniques as well as observer design technique. Students also learn to use MATLAB computational software to understand new concepts and to perform and implement system analysis and design techniques. The methods of assessment of student learning in this course are homework assignments, quizzes, tests, and a design project.

### **EE 528 - Design of Analog CMOS Integrated Circuits (3 cr.)**

Prerequisite: EE 320 or equivalent.

Cross-Listed as: EE 428

The general objective of the course is to introduce students to the building blocks of analog integrated circuits; such as differential amplifiers, current sources and mirrors, gain stages, level shifters, active loads, and output stages. Throughout the semester, Spice will be used to emphasize and to help in understanding important concepts of the course as well as a tool for solving homework

problems. The primary methods of assessing student learning are homework assignments, quizzes, exams, and a term project.

### **EE 530 - Nanoelectronics (3 cr.)**

Prerequisite: EE 312 and EE 320

Cross-Listed as: EE 430

This course is a sequence in the study of microelectronic circuits by introducing students to the electrical properties of nanoscale CMOS transistors including both planar and FinFet MOSFETs as well as introduce students to the physical design of such technologies. The goals of this course are to provide the student with (1) a working knowledge of short channel effects in nanoscale transistors; (2) an understanding of the non-linear models used to capture quantum effects in transistors; (3) a perspective in electronic design automation (EDA) principles for the physical design of complex integrated circuits consisting of billions of nanoscale transistors; (4) an exposure to semiconductor foundry process design kits (PDKs) that aid and govern circuit designers in creating physical integrated circuit designs. Throughout the semester, the course will utilize the state of the art electronic design automation software Cadence to aid in learning and understanding of key concepts. The primary methods of assessing student learning are homework assignments, quizzes, exams and design projects.

Formerly "VLSI Design"

### **EE 535 - Fuzzy Logic (3 cr.)**

Prerequisite: Junior or Senior standing.

Cross-Listed as: EE 435

This course covers the fundamentals of fuzzy logic theory and its applications. Students learn to analyze crisp and fuzzy sets, fuzzy propositional calculus, predicate logic, fuzzy logic, fuzzy rule-based expert systems, and apply fuzzy logic theory to a variety of practical applications. Students also learn to use MATLAB computational software to understand new concepts and to perform and implement fuzzy logic rules and systems. The methods of assessing student learning in this course are homework assignments, quizzes, classroom discussions, design projects, and a final exam.

### **EE 545 - Neural Networks - Deep Learning (3 cr.)**

Prerequisite: MATH 236 or concurrently.

Cross-Listed as: EE 445

This is a study of the basic concepts of neural networks and its application in engineering. In this course students learn the single layer and multilayer neural network architectures; understand linear and nonlinear activation functions; and analyze and implement McCulloch-Pitts, Hebbian, Hopfield, Perceptron, Widrow-Hoff, ADALINE, delta, and back propagation learning techniques with ample practical applications. Students also learn to use MATLAB computational software to understand new concepts and to perform and implement neural network rules and paradigms. The methods of assessing student learning in this course are homework assignments, quizzes, classroom discussions, design projects, and a final exam.

Formerly Neural Networks

### **EE 548 - Integrated Photonics (3 cr.)**

Prerequisite: EE 314 or equivalent.

Cross-Listed as: EE 448

This course is designed to introduce electrical engineering students to the emerging field of integrated photonics. Maxwell's equations at

optical frequencies are the foundation for photonic integrated circuit design. This course will specifically explore how nano structures are used to generate, guide, and detect light for applications in communication systems, sensor design, and biomedical devices manufactured using semiconductor foundry techniques. Throughout the semester the course will utilize the state-of-the-art photonics integrated circuit design software Lumerical to aid in learning and understanding of key concepts. Students will also use the equipment in the LEAP@WNE laboratory to measure and characterize silicon photonic circuits. Upon completion of the course, students will be proficient in photonic integrated circuits from theory to practical design and implementation. The primary methods of assessing student learning are homework assignments, quizzes, exams and design projects.

formerly Silicon Photonics

### **EE 549 - Optical Engineering (3 cr.)**

Prerequisite: MATH 235

Cross-Listed as: EE 449

This course introduces fundamental principles of classical and modern optics as well as key principles in optical design used in the engineering of optical systems. The course offers students an exposure to practical aspects of optical materials and devices. Key topics discussed include the propagation of light, lenses/aberrations, diffraction, interference, holography, and fiber optics. Active optical components are also discussed including light modulators, photodetectors, and LASERS. Students will also use the equipment in the LEAP@WNE laboratory to measure and characterize optical systems to reinforce key concepts in the course. Key assessment techniques will include homework assignments, exams, and design projects. Project based learning will be a key component of the course and student outcomes.

### **EE 555 - RF and Microwave Wireless Systems (3 cr.)**

Prerequisite: EE 314 or equivalent.

Cross-Listed as: EE 455

This course provides an introduction to various RF and microwave system parameters, architectures and applications; theory, implementation, and design of RF and microwave systems for communications, radar, sensor, surveillance, navigation, medical, and optical applications. The primary methods of assessing student learning are homework assignments, quizzes, exams, and design projects.

### **EE 556 - RF and Microwave Active Circuit Design (3 cr.)**

Prerequisite: EE 314 or equivalent.

Cross-Listed as: EE 456

The general objective of the course is to introduce students to the principles, processes and techniques used in the design and realization of modern microwave and wireless active circuits. The emphasis of the course is on the design of narrow band, broadband and low noise amplifiers employing three terminal devices such as HEMETs and HBTs. Detailed study of noise figure, noise parameters and stability of RF and microwave circuits using S-parameters. Modern RF & microwave CAD such as Advanced Design System (ADS), ANSYS DesignerRF, and MATLAB will be used to emphasize and to help in understanding important concepts of

the course. The primary methods of assessing student learning are homework assignments, quizzes, exams, and design projects.

### **EE 557 - Wave Transmission and Reception (3 cr.)**

Prerequisite: EE 314.

Cross-Listed as: EE 457

This course is designed to provide seniors/first year graduate students in electrical engineering with a solid foundation in applied electromagnetics. A review of transmission lines and the design of impedance-matching techniques will be explored. The application of Maxwell's equations to guided waves and radiation will also be explored. The rectangular waveguide is studied. Following this an introduction to basic antenna theory is given. Basic properties of transmitting and receiving antennas and antenna arrays will be introduced. Applications in such diverse fields as wireless communication systems, Radar and microwave imaging will be emphasized. Modern RF & microwave CAD such as ANSYS HFSS, ANSYS DesignerRF, and MATLAB will be used to emphasize and to help in understanding important concepts of the course as well as a tool for solving homework problems. The primary methods of assessing student learning are homework assignments, exams, and design projects.

### **EE 567 - Solid-state Electronic Devices (3 cr.)**

Prerequisite: EE 312.

Cross-Listed as: EE 467

The electrical behavior of solids, or the transport of charge through a metal or semiconductor, is determined by the properties of the electrons and the arrangement of atoms in the solid. Through a study of the crystal structure of electronic materials and the fundamentals of quantum electronics, students understand the band theory of solids, particle statistics, transport phenomena, and conductivity. Further study of equilibrium distributions in semiconductor carriers and p-n junctions leads to an understanding of solid state device operation. The investigation of practical devices such as diodes, IMPATT diodes, bipolar and junction field-effect transistors, and MOS devices enhance students' knowledge of the design and analysis techniques used in real-world applications. A design project is required. Upon completion of this course students should be proficient in the use of solid-state component and system design techniques and are familiar with a wide variety of semiconductor device applications. The methods of assessing student learning in this course are homework assignments, quizzes, classroom discussions, design projects, and a final exam.

### **EE 570 - Computer-Controlled Systems (3 cr.)**

Prerequisite: EE 302 or concurrently, and MATH 236.

Cross-Listed as: EE 470

Students learn the fundamentals of the state space approach to discrete systems modeling, analysis, and design. They also learn to find the discrete state space model of mechanical, electrical, and electromechanical systems, and learn how to solve zero input, zero state, and complete responses of a system represented in discrete state space form. In addition students learn to analyze stability, controllability, and observability of sampled data system and to design computer controlled feedback systems to improve performance of a discrete time systems as well as learning to design observers. Students also learn to use MATLAB computational software to understand new concepts and to perform and implement discrete system analysis and design techniques.

**EE 601 - Advanced Electrical Engineering Analysis (3 cr.)**

Prerequisite: Graduate standing

This course presents the underlying analysis techniques necessary for advanced study in electrical engineering. Topics include vector spaces, parametric equations, linear algebra, systems of differential equations, Fourier transforms, and the theory of functions of a complex variable including Taylor and Laurent series and residues and poles.

**EE 614 - Advanced Electromagnetics (3 cr.)**

Prerequisite: EE 314 or equivalent.

This is a study of the microscopic and macroscopic properties of magnetic and insulating materials. Topics include gyromagnetism, permeability tensor, reflection and refraction, skin effect, antenna analysis, and relativistic electrodynamics.

**EE 615 - Antenna Theory and Design (3 cr.)**

Prerequisite: EE 457 or equivalent.

The course introduces the fundamental principles of antenna theory and applies them to antennas used in wireless communications systems and other advanced antenna systems. Topics include: an introduction to EM wave equations and their solutions in unbounded space as plane and spherical waves; EM radiation; antenna concepts such as radiated power, gain, pattern, and radiation resistance; basic antenna elements including dipoles, loops, microstrip antennas, and traveling-wave antennas; antenna arrays; microwave aperture antennas; and receiving antenna theory.

**EE 616 - Introduction to Numerical Electromagnetics (3 cr.)**

Prerequisite: EE 614.

Introduction to numerical methods in electromagnetics including finite difference, finite element, and integral equation; methods for static, harmonic, and time dependent fields; use of commercial software for analysis and design purposes; and applications to open and shielded transmission lines, antennas, cavity resonances, and scattering.

**EE 621 - Coherent Optics (3 cr.)**

Prerequisite: EE 601 and EE 314 or equivalent.

Modern optical techniques rely heavily on the analysis of the coherent properties of light and the Fourier transform to explain the diffraction and interference associated with optical wave propagation and image formation. Beginning with a review of basic electromagnetic wave principles and Maxwell's equations, students develop an understanding of those modern optical techniques used to analyze coherence, polarization, interference, and diffraction. A study of light quanta and optical spectra leads to an understanding of laser operation, and throughout the course, theoretical analysis is supplemented with discussions of such applications as holography, optical data processing, optical sensing, fiber lasers, and other current topics. A design project is required. Upon completion of the course, students should be able to understand the theory and analysis techniques used in modern optical systems and develop some proficiency in the design and implementation of simple optical systems for applications. The methods of assessing student learning in this course are homework assignments, quizzes, classroom discussions, design projects, and a final exam.

**EE 625 - Stochastic Processes - Kalman Filters (3 cr.)**

Prerequisite: Graduate standing

This course covers the basic principles of stochastic processes and control systems. Students learn and review summary state space representations for continued and discrete systems, random variables, and processes. In addition they learn random processes, moments of random processes, and statistical properties of outputs of stochastic systems as well as analysis and design of Kalman filters. Students also learn to use MATLAB computational software to understand new concepts and to perform and implement system analysis and design techniques. The methods of assessing student learning in this course are homework assignments, classroom discussions, design projects, and a final exam.

**EE 650 - Advanced Digital Signal Processing (3 cr.)**

Prerequisite: ENGR 212 or IE 212; EE 485 or equivalent.

This is an advanced study of digital signal processing and its applications to speech, radar, and image processing. Topics include least squares filter design, adaptive filters, time, and frequency-domain analysis of two-dimensional (2D) signals and systems; 2D DFT and Z-transform; theory and design of 2D filters; homomorphic signal processing; and spectral estimation. Some computer programming and simulation required.

**EE 651 - Power Electronics (3 cr.)**

Prerequisite: EE 303 or equivalent.

Cross-Listed as: EE 450

This is a course in the components and systems used in power electronics. After successfully completing this course students will be familiar with the types and uses of electronic power components as well as understanding and using the various analytical methods (including state space and piecewise linear) that model components and systems that manage, control, and convert electrical energy. Topics include (but are not limited to) semiconductor power devices (such as diodes, SCRs, power FETs, etc.), energy conversion methods (such as ac-dc, dc-dc, dc-ac, etc.), converter electronics (such as buck, boost, etc.), conversion efficiency, and output regulation. The methods of assessing student learning in this course are homework assignments, quizzes, classroom discussion, a research project, and a final exam.

Formerly EE 550

**EE 667 - Advanced Electrical Materials (3 cr.)**

Prerequisite: EE 312, EE 302, EE 314, or equivalent.

This is a study of electrical materials. Topics include crystal structure of solids, quantum theory and mechanics of solids, semiconductor physics, magnetic theory and materials, modern devices, integrated electronic materials and devices, and materials and devices for direct energy conversion. A design project is required.

**EE 670 - AI: Applied Neural Networks and Machine Learning (3 cr.)**

Prerequisite: Graduate standing

Cross-Listed as: CPE 673, ME 670, IE 670, CEE 673

This course concentrates on application of neural networks in the field of engineering. In this course students will learn vision-based applications of Perceptron algorithm as well as back propagation. Linearly and nonlinearly separable clustering and classification problems will be covered. This course is project based and

concentrates on the latest applied Neural Networks and Machine Learning algorithms. All concepts are heavily reinforced using MATLAB, the main computational platform.

Formerly "Optimal Control Systems"

### **EE 671 - AI: Machine Learning - Concepts (3 cr.)**

Prerequisite: Graduate standing

Cross-Listed as: CEE 671/ME 671/CPE 671/IE 671

This course focuses on AI concepts such as Data Exploration, Single and Multivariate Parametric and Non-Parametric methods of regression and classification tasks. Students will learn the theory that underlies these algorithms and implement them using popular machine learning packages such as Python with scikit-learn and MATLAB. During the final project, students will implement multiple algorithms and learn how to select the best algorithm with the optimized hyperparameters.

### **EE 672 - AI: Machine Learning - Applications (3 cr.)**

Prerequisite: Graduate standing

Cross-Listed as: CEE 67/ME 672/CPE 672/IE 672

This course focuses on Artificial Intelligence application packages such as Data exploration, Natural Language Processing, Support Vector Machine, Reinforcement Learning, Artificial Neural Networks (ANNs) and Computer Vision and Deep Learning. Students will learn the theory and applications of a variety of algorithms. These algorithms will be implemented using Python and MATLAB software. As the final project, students will apply a combination of algorithms to a specific application and develop an end to end solution.

### **EE 675 - Advanced Motion Controls (3 cr.)**

Prerequisite: Graduate standing or permission.

This course studies advanced industrial motion control using various types of drives. Motor sizing, driver selection and electro mechanical systems design is the main emphases of this course: Topics covered include: design of motion control systems based on DC motors, brushless DC motors, Induction motors, three phase motors and stepper motors. The operating principles of these motors, their control and pros and cons for different applications are discussed. Variety of motor drive hardware and software including variable frequency drives are discussed and demonstrated.

Formerly EE 575.

### **EE 676 - AI: Applied Fuzzy Logic (3 cr.)**

Prerequisite: Graduate standing

Cross-Listed as: CPE 674, ME 676, IE 676, CEE 676

This course covers the fundamentals of fuzzy logic theory and its applications. In this course students will learn to analyze crisp and

fuzzy sets, fuzzy propositional calculus, predicate logic, fuzzy logic, fuzzy rule-based expert systems, and will learn to apply fuzzy logic theory to a variety of practical applications. Students will also learn to use MATLAB computational software to understand new concepts and to perform and implement fuzzy logic rules and systems. Machine Controls will be the application.

Formerly "Intelligent Motion Controls"

### **EE 677 - Advanced Continuous and Discrete Systems Analysis and Controls (3 cr.)**

Prerequisite: Graduate Engineering Standing.

In modern control theory, the dynamics of the processes are described by a series of first-order differential equations in matrix form as compared to the transfer functions in classical control theory (frequency domain approach to analysis and design). State-space concepts (modern control theory) have made an enormous impact on the analysis and design of controllers for complex multi-input/multi-output systems. In recent years, modern control theory has advanced rapidly and is now recognized as an indispensable and practical technique for the design and analysis of feedback control problems. In this course students learn continuous and discrete modern state space analysis and design techniques as applied to a variety of mechatronic systems. This course introduces students to: modeling; eigenvalues and eigenvectors; controllability and observability; design of controllers using state and output feedback; and observer design. This course will be offered as an on line / optional in class course. The course will count towards one of the required EE courses for the Mechatronics concentration.

### **EE 678 - Linear and NonLinear Systems Modeling and Simulation (3 cr.)**

Prerequisite: Graduate Standing.

In this course students learn the fundamentals of modeling mechanical, electrical and electromechanical systems. MATLAB and Simulink will be used to model linear and nonlinear systems. Simulink is a multi-domain environment for modeling complex systems and is used nationally and internationally by many companies. A variety of techniques including frequency domain and state space methods will be utilized to model mechanical and electromechanical systems. Many different feedback control techniques including gain scheduling will be studied to modify and improve systems performance and stability. This course will be offered as an on line/ optional in class course. The course will count towards one of the required EE courses for the Mechatronics concentration.

### **EE 685 - Electrical Engineering Project (3 cr.)**

Prerequisite: EMGT 605 or EMGT 648 and 12 credit hours minimum in the program.

Students must select a project faculty advisor and obtain topic approval prior to registration for this course. This is an independent engineering project under the supervision of a project faculty advisor. The design process is emphasized. Progress reports and a final written report are required. An oral presentation and defense of the project is made before a faculty committee.

### **EE 690 - Special Topics in Electrical Engineering (3 cr.)**

This is a study of an advanced topic in engineering of special interest to electrical engineering majors, but not carried in the catalogue on a regular basis.

**EE 698-699 - Thesis Research (6 cr.)**

This is a research course open to electrical engineering graduate students who have completed requirements for admission to candidacy for the master's degree. Prior to registration, written permission to enroll must be obtained from the student's advisor.

**EMGT - ENGINEERING MANAGEMENT****EMGT 522 - Occupational Safety and Health (3 cr.)**

Prerequisite: Graduate standing.

This course covers foundational programs related to health and safety from an occupational/industrial perspective to build the knowledge and skills needed to create and support Industrial and occupational environments that are free of safety and health hazards. The curriculum will focus on building skills and competencies to promote detection, analysis, and correction of unsafe conditions and procedures. The course is structured to align with OSHA requirements so that the student will be well suited for OSHA 30 hour certification and other occupational safety and health certifications

**EMGT 590 - Special Topics in Engineering Management (3 cr.)**

This is a study of an advanced topic in engineering of special interest to engineering management majors, but not carried in the catalogue on a regular basis.

**EMGT 602 - Engineering Crisis, Disaster, and Risk Management (3 cr.)**

Prerequisite: Graduate standing.

This course offers the foundation for students interested in advanced studies in Hazard Identification, Risk Scenario Development, Environmental Impact and Risk Assessments, Domestic & International Emergency Management, and Safety Management Systems. The goal is for the student to develop a functional knowledge of risk and emergency management practices and applications that can be applied to their professional career within an organization that must identify potential hazards, maintain continuity during, and recover operations immediately after a crisis. Towards this, the course is delineated as three sections: 1) Mechanisms for identifying relevant scenarios that identify hazards. 2) Practical applications of crisis and emergency management strategies, such as the National Environmental Policy Act, 3) Functional processes of state and federal disaster planning and response infrastructures.

Formerly "Engineering Risk Management"

**EMGT 605 - Engineering Management (3 cr.)**

Prerequisite: Graduate standing.

This is a study of the major management functions of the firm with emphasis on engineering and research. Topics include organization, planning, coordination, and control of operations; corporate objectives; managerial decision-making; human relations; and product development.

**EMGT 607 - Quality Engineering (3 cr.)**

Prerequisite: Graduate standing.

This course covers the fundamental concepts of quality management including the management philosophy underlying BIS. Product quality and care of customers, management leadership, teamwork, constant improvement and innovation, and the influence of human performance in product quality and inspection are included.

**EMGT 609 - Strategic Engineering Economics (3 cr.)**

Prerequisite: Graduate standing.

Cross-Listed as: CEE 609 and IE 609

This course studies the economic aspects of engineering design problems. Students will learn how to comprehensively analyze the economics of engineering projects and build a strategic business case for their designs. Topics covered include the fundamental concepts of economics, game theory, the time value of money, decision making under uncertainty, and special considerations for evaluating projects with very long time horizons.

Cannot take CEE 609 and IE 609 for credit.

Formerly Engineering Cost Analysis.

Formerly Advanced Engineering Economics.

**EMGT 611 - Strategic Direction of Technology and Innovation (3 cr.)**

Prerequisite: Graduate standing.

This course investigates the management of complex engineering activities and technological approaches corresponding to product and process innovation. The student will achieve an understanding of strategic management of technology and innovation through a series of lectures combined with the relevant case studies to be summarized by an analysis of an organizations' strategic management process.

**EMGT 615 - Statistical Quality Control (3 cr.)**

Prerequisite: Probability and Statistics background

This is an overview of popular statistical methods as applied to quality assurance. Topics include a review of data analysis and hypothesis testing, coverage of statistical process control (variable and attribute control charts), process capability analysis, and acceptance sampling (lot-by-lot and continuous).

**EMGT 619 - Engineering Supply Chain (3 cr.)**

Prerequisite: Graduate standing.

Cross-Listed as: IE 619

Companies are continuously working towards aligning their operations with supply chain management solutions. This course will cover the theory, principles, and implications of supply chain management and is intended to provide students with an understanding of the strategic and tactical elements of supply chains. Topics covered include supply chain networks and design, planning supply and demand, inventory management, managing uncertainty, transportation issues, financial factors, and coordination. The focus of the class is both theoretical and practical and will include case studies.

**EMGT 620 - Multi-Criteria Decision Analysis (3 cr.)**

Prerequisite: Graduate standing, Probability & Statistics

Cross-Listed as: IE 620

This course surveys multi-criteria and multi-objective choice problem modeling methodologies including: stakeholder engagement, criteria

selection and weighting methodologies, alternative ranking and outranking methodologies. Specific methodologies reviewed include Multi-Attribute Utility Theory, Analytic Hierarchy Process, TOPSIS, ELECTRE, DEMATEL, PROMETHEE and extensions into choice decisions using uncertain and fuzzy data, as well as Multi-Objective "GOAL" Programming.

### **EMGT 622 - Lean Production Systems (3 cr.)**

Prerequisite: Graduate standing.

Cross-Listed as: IE 622

This is a study of the problems, analytical techniques, and recent developments that relate to the traditional production systems and lean production systems. Topics include forecasting, inventory control, production planning, scheduling, and the relationships between manufacturing and other functions of the firm. Emphasis is on pull/demand based production systems.

### **EMGT 624 - Engineering Management Information Systems (3 cr.)**

Prerequisite: Graduate standing.

This is an overview of computerized systems for information handling and reporting including spreadsheets, database systems, and graphics. Emphasis is on development, installation, and control of information systems for production and operational managers. Hands-on experience is provided using popular personal computer software.

### **EMGT 626 - Discrete Event Simulation (3 cr.)**

Prerequisite: FORTRAN or BASIC; ENGR 212 or IE 212 or equivalent.

Cross-Listed as: IE 626

This is a study of the computer simulation applied to queuing networks, inventory and production control, and material handling systems.

Formerly "Computer Simulation of Engineering/Business"

### **EMGT 627 - Legal and Ethical Issues of Engineering (3 cr.)**

Prerequisite: Graduate standing.

This course presents the ethical and legal issues faced by engineers and engineering managers with a focus on practical applications and case studies that highlight these issues. Students who complete this course will have a practical framework for addressing the ethical aspects of engineering and engineering management practice. Topics covered include the evolution of engineering ethics, professional responsibilities and codes of conduct, the relationship between ethics and the law, engineering ethics in the global context, and the ethical considerations of engineering's environmental impacts.

Formerly "Legal Aspects of Engineering"

### **EMGT 629 - Advanced Manufacturing Engineering Systems (3 cr.)**

Prerequisite: Graduate standing.

Cross-Listed as: IE 629

This is a study of manufacturing systems techniques with special emphasis on cost estimating, automation, group technology, expert

systems, flexible assembly, cellular manufacturing, and other related special topics.

### **EMGT 631 - Production and Inventory Modeling (3 cr.)**

Prerequisite: Graduate standing.

Cross-Listed as: IE 631

This course provides the theory and application of forecasting and modeling aggregate demand, fragmented demand and consumer behavior using statistical methods for analysis for services and products. Resulting models are correlated to engineering and management decisions made with respect to product, process and systems design. The theory and practice of production and inventory modeling will be covered

### **EMGT 635 - Operations Research (3 cr.)**

Prerequisite: EMGT 620 or equivalent.

Cross-Listed as: IE 635

This course provides the theory and application of deterministic optimization models. Topics include problem formulation, the simplex method, duality and primal dual relationships, complementary slackness, revised simplex and interior point algorithms. Solution approaches will be done traditionally and using contemporary software

Formerly Optimization Methods I

### **EMGT 637 - Ergonomics and Occupational Safety (3 cr.)**

Prerequisite: Graduate standing.

This is a study of research related to the interface of human beings and machines. Topics include human factors, product and equipment design, capabilities and limitations of the human sensory-motor system, design of displays, and interaction between individual groups and machine systems.

### **EMGT 640 - Energy Management (3 cr.)**

Prerequisite: EMGT 609 or equivalent.

Cross-Listed as: CEE 641

This is an examination of energy cost and its impact on technical and management approaches to conservation programs. Topics include energy reduction in electrical and thermal systems; heating, ventilation, and air conditioning systems; and methods of initiating and managing an effective conservation program.

### **EMGT 642 - Engineering Materials (3 cr.)**

Prerequisite: Graduate standing.

This course will explore the impact of engineering materials on the design, development, and manufacture of consumer and producer goods. Fundamental information on the interrelationship of the processing, properties and structure of metals, polymers, ceramics, and composites will be presented. A systematic approach will be employed to select engineering materials based on the mechanical and physical properties necessary to meet the need and/or design requirements. Optimization of the material selection process will also consider factors such as shape, function, manufacturing processes, and sustainability. Case studies and team projects will focus on materials selection and knowledge of materials science. The students completing this course will have useful solutions to standard problems in industry and a working knowledge of the materials

selection. The methods of assessing students include homework, quizzes, a midterm exam, design project report(s), and a final exam.

### **EMGT 643 - Design of Experiments (3 cr.)**

Prerequisite: Graduate standing, Probability & Statistics

Cross-Listed as: IE 643

This is an overview of statistical methods for design of products and processes. Topics include experimental design and analysis, regression analysis, robust design, and Taguchi's methods. Currently popular methods are surveyed.

### **EMGT 644 - Quality Systems and Process Improvement (3 cr.)**

Prerequisite: Graduate standing.

Cross-Listed as: IE 644

This is a quantitative course covering an analysis of quality system structures in industry today and the process improvement tools used in quality systems. Process and quality tools such as SPC, Gage R & R, ISO 9000, 6 Sigma, benchmarking, and the Malcolm Baldrige National Quality Award are studied. The course is based on applications of these quality principles.

### **EMGT 645 - Quantitative Models of Supply Chain Management (3 cr.)**

Prerequisite: EMGT 619.

Cross-Listed as: IE 645

This course will look at both fundamental and newer models in supply chain management. Topics covered include inventory theories under uncertainty, supply chain contracting and coordination, risk pooling, and stochastic decision-making.

### **EMGT 647 - Facility Planning (3 cr.)**

Prerequisite: Graduate standing.

This is a study of techniques for facility location, design, and planning. Other related topics include materials handling, warehousing, computer-aided designs, and maintenance considerations.

### **EMGT 648 - Project Management (3 cr.)**

Prerequisite: Graduate standing.

This course examines project techniques which place emphasis on organizational and behavioral issues. It provides hands-on project management experience developing project plans with the use of computer software.

Course may be repeated 3 times.

### **EMGT 650 - Systems Integration (3 cr.)**

Prerequisite: Graduate standing.

Cross-Listed as: IE 650

This course is an introduction to the relevant issues and required techniques for successful systems design development, integration, management, and implementation. The principles and methods for system lifecycle analysis, system planning and management, systems integration, and strategic decision-making will be covered in this course. The interfaces between the system, subsystems, the environment, and people will be part of the course materials. Students

will learn the factors to control the total system development process designed to ensure a high quality and effective system.

### **EMGT 680 - Engineering Project (3 cr.)**

Prerequisite: EMGT 605 or EMGT 648 and 12 credit hours minimum in the program.

Students must select a project faculty advisor and obtain topic approval prior to registration for this course. This is an independent engineering project under the supervision of a project faculty advisor. The design process is emphasized. Progress reports and a final written report are required. An oral presentation and defense of the project is made before a faculty committee.

### **EMGT 690 - Special Topics in Engineering Management (3 cr.)**

This is a study of an advanced topic in engineering of special interest to engineering management majors, but not carried in the catalogue on a regular basis.

### **EMGT 691 - Special Topics in Engineering Management (3 cr.)**

This is a study of an advanced topic in engineering of special interest to engineering management majors, but not carried in the catalogue on a regular basis.

### **EMGT 698 - Thesis Research (3 cr.)**

This is a research course open to engineering management graduate students who have completed requirements for admission to candidacy for the master's degree. Prior to registration, written permission to enroll must be obtained from the student's advisor.

### **EMGT 699 - Thesis Research (3 cr.)**

This is a research course open to engineering management graduate students who have completed requirements for admission to candidacy for the master's degree. Prior to registration, written permission to enroll must be obtained from the student's advisor.

### **EMGT 701 - Seminar / Research Methods for Engineering Management (3 cr.)**

Prerequisite: Enrollment as EMGT Ph.D. student.

This course provides tools and techniques employed to be used in engineering management research. Topics covered include: program/faculty overview, literature review methods and tools, hierarchy of research questions, research ethics, and visual display of quantitative information.

### **EMGT 702 - Risk Assessment (3 cr.)**

Prerequisite: Graduate standing

Cross-Listed as: IE 612

This course provides an understanding of systems engineering and complex systems. It emphasizes the development of the fundamentals of systems engineering, engineering life cycle models and phases, systems design for operational feasibility, and an introduction to planning for systems engineering and management.

Formerly "Systems Engineering"

### **EMGT 704 - Engineering Risk Analysis Methods (3 cr.)**

Prerequisite: EMGT 602 or permission

Cross-Listed as: IE 614

This course develops the students understanding of risk analysis methods for engineering systems, such as infrastructure development projects for organizational and societal planning purposes. The course develops a robust foundation for qualitative and quantitative risk analysis through problem structuring, data collection and data analysis before transitioning to leveraging software packages that enhance the analyst's capabilities to model systems and understand risks within the system. It examines methods and processes of planning for, identifying, assessing, monitoring, and responding to project risk. Methods explored include fault tree development and analysis, decision tree analysis, risk modeling and simulation.

This course examines the application of engineering management technique methodology to recognize, evaluate, and make decisions regarding expenditures for the mitigation of potentially risks associated with large engineering projects. It examines methods and processes of planning for, identifying, assessing, monitoring, and responding to project risk. Quantitative risk analysis procedures, including decision free analysis, risk simulation, risk ranking, and risk responding techniques are covered.

Formerly Engineering Risk Analysis

### **EMGT 706 - Enterprise and Complex Systems for Engineers (3 cr.)**

Prerequisite: EMGT 631.

This course provides the theory and application of enterprise systems concepts from functional, technical, and implementation perspectives, with emphasis on the process and product based organizations. The course also investigates the designing of enterprise resource planning systems to support manufacturing, engineering and service systems. Students develop a comprehensive set of techniques and methods to design, maintain and evolve the systems engineering function in support of strategic enterprise objectives and operations.

### **EMGT 709 - Advanced Engineering Cost Estimation (3 cr.)**

Prerequisite: EMGT 609 or equivalent.

This course is a study of the mechanics of project cost estimating and project evaluation from a cost benefit perspective. The goal is for the student to develop a robust knowledge of current methods for project cost estimating, equipment costing and replacement analysis, as well as project cost/benefit and effectiveness analysis for private and public sector projects. Breakeven analyses are leverage to aid the buy/rent/lease/outsourced decision process. A case study approach is adopted through which the student will develop understanding of drivers for cost overruns of existing infrastructure projects. A risk perspective to cost estimating is integrated.

### **EMGT 726 - Advanced Modeling and Analysis of Systems (3 cr.)**

Prerequisite: Graduate standing, EMGT 626 or equivalent.

This course provides an overview and application of advanced topics in computer simulation including experimental design, simulation optimization, variance reduction, and statistical output analysis techniques applied to discrete event simulation. This is accomplished

by investigating and modeling applications in manufacturing, business, and service systems.

### **EMGT 735 - Optimization Methods II (3 cr.)**

Prerequisite: Graduate standing, EMGT 635 or equivalent.

This course provides the theory and application of probabilistic optimization models. Topics include probabilistic decision analysis, stochastic models, risk and uncertainty, probabilistic inventory problems, queuing theory, Markov processes, and dynamic programming.

### **EMGT 740 - Scheduling and Sequencing (3 cr.)**

Prerequisite: Graduate standing, EMGT 620 or EMGT 635 or equivalent.

This course provides an introduction to various operations research approaches for solving sequencing and scheduling problems. The NP-completeness of most scheduling problems leads to a discussion of computational complexity, the use of heuristic solution methods, and the development of worst case bounds. Several algorithms and various operations research approaches for solving sequencing and scheduling problems in a variety of machine environments (single-machine, parallel machines, flow shops, and job shops) are investigated.

### **EMGT 765 - Special Topics in Engineering Management (1-3 cr.)**

Prerequisite: Graduate standing and permission of instructor.

Topics in engineering management that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **EMGT 770-799 - Dissertation Research (1-3 cr.)**

Prerequisite: EMGT 701.

This course will provide the structure for designing, conducting, writing, and presenting dissertation research. Students will meet individually with the dissertation. Discussion, presentation and guidance of the dissertation research will take place during these research meetings.

## **ENGL - ENGLISH**

### **ENGL 500 - Pronunciation, Intonation and Speech (0 cr.)**

Prerequisite: Admissions into graduate intensive English program.

The content of the course will focus on American English sounds, stress, and intonation patterns. Students will listen to and study speeches given by native speakers of English for the purpose of becoming aware of phonological, rhetorical, and cultural patterns in American communities. Students will also practice academic presentation skills appropriate for graduate students in a North American academic environment.

### **ENGL 501 - Writing for a North American Academic Audience (0 cr.)**

Prerequisite: Admissions into graduate intensive English program.

The primary goal of the course is to prepare international graduate students to write academic papers for a North American audience. Specifically, the course will focus on contrastive rhetoric, structure,



conventions, organization, and documentation that is necessary when writing academic papers in a North American context. Students will learn how to revise, edit, and proofread their own papers, which will include a grammar review that is contextualized.

### **ENGL 502 - Academic Literacies Across the Curriculum for International Graduate Students (0 cr.)**

Prerequisite: Admissions into graduate intensive English program.

The focus of the course is to introduce students to academic sources from a variety of disciplines. Students will learn to summarize, critique, and synthesize the content that they read with their own ideas through discussion and writing. Awareness of academic language structures in various disciplines will be introduced as well as the appropriate use of sources when writing academic papers.

### **ENGL 503 - Discourse, Fluency, and Conversation for Graduate Students (0 cr.)**

Prerequisite: Admissions into graduate intensive English program.

The focus of the course is to enhance fluency in conversation in both academic and informal settings. Students will become aware of various discourses embedded in the culture so that they can interact effectively with native speakers in a variety of academic and informal settings. Strategies to enhance intercultural communication skills will also be emphasized.

### **ENGL 550 - Fiction Workshop (3 cr.)**

Prerequisite: Formal acceptance into graduate program.

What is the purpose of analyzing a form? Comprehension of the form. Before students can create in a given form, they must struggle to know it, and re-reading is the first step toward such knowledge. To this end, students will read and study the work of masters in the short story. Students will read the 19 century master of the short story, Anton Chekhov, then leap forward to 20th and 21st century stylists.

This course is a hands-on workshop in which students will learn how a story is made by doing it. Students will begin with stories written in first person, which allows for direct representation of inner consciousness, and move on to third person and the use of free indirect style, one of most important aspects of fiction writing. Students will work on how to balance dialogue and scene with exposition. They will discuss and analyze plot-lines, trace curves and arcs, try out alternate beginnings, find new endings, looking for the best shape to each story. And all along, students will practice writing a variety of sentences, from the simple to the complex, the interrupted to the periodic and labyrinthine.

ENGL 550 is repeatable for credit.

### **ENGL 555 - The Craft of Fiction (3 cr.)**

Prerequisite: Formal acceptance to program.

This course, which will begin during each of the two yearly residencies, will be taught by a different visiting instructor/author each term. It is a class for writers, taught by writers, about the craft of writing. Students will perform close reading of exemplary literary work and look at how they are made. The class will ask questions about where the story begins, how this influences the writing, the important of the first line. The class will trace how the story is put together, how time passes, how character is presented, what kinds of sentences the writer tends toward, the texture her prose evokes, her

disposition toward scene and narrative, how exposition she offers, and how much resolution.

This craft seminar will serve as a complement to ENGL 550, Fiction Workshop. The course will begin in person during each residency and then will be taught on-line by the instructor/mentor over the course of two consecutive 11-week graduate terms.

The curriculum will be individualized to best meet the literary aspirations of the student. A narrative evaluation of the student's work will be given after each term along with a Pass/Fail grade.

The course can and should be repeated with each new residency and with new instructors/mentors who bring a new approach to the craft of fiction to the students.

Graded Pass/Fail.

ENGL 555 is repeatable for credit.

### **ENGL 590 - Special Topics in Creative Writing (3 cr.)**

Prerequisite: Formal acceptance to program.

The topics for this course will be chosen based on expressed student interests as aspiring authors. The course, like the two core classes (Fiction Workshop and The Craft of Fiction), will begin during one of the two yearly residencies and then continue with on-line instruction with the instructor/faculty member based on an individualized curriculum.

Courses could focus on Creative Nonfiction, narrative poetry, or subgenres of the novel or short story, including (but not limited to) Young Adult Fiction, Crime Fiction, Fantasy, Science Fiction.

Graded Pass/Fail.

## **FIN - FINANCE**

### **FIN 612 - Business Analysis and Valuation (3 cr.)**

Prerequisite: AC 101/HONB 203/AC 201 or the equivalent, FIN 214 or FIN 630, and proficiency with Excel.

The objective of this course is to provide hands-on experience in the analysis of financial and non-financial information, including developing understanding of its creation and use within the firm's economic and strategic environments. By the end of the course, students are expected to be well-versed in reading firms' financial statements and understanding how financial statement analysis can be used in a variety of business contexts.

### **FIN 630 - Managerial Finance (3 cr.)**

Prerequisite: AC 101/HONB 203/AC 201, FIN 214 or equivalent, Graduate Standing - must be completed prior to taking this course.

This course examines how corporations benefit society by raising funds in the financial markets and employing them in productive activity. Key outcomes include the ability to apply the basic tools of ratio analysis, proforma analysis, time value of money, elementary security analysis, capital budgeting, and working capital management techniques to maximize owner value. Financial structure and capital risk management are also considered.

## HIST - HISTORY

### HIST 520 - Documents of World and American History (3 cr.)

Prerequisite: Restricted to MEEE majors.

This course will explore in depth the topics in world and American history contained in the elementary curriculum in the Massachusetts History Curriculum Framework. The focus of the course will be the reading and analysis of primary sources (documents, images, and material objects) with the aim of aiding teachers in achieving a deeper understanding of the material and methods to integrate it into their teaching and curriculum.

## IE - INDUSTRIAL ENGINEERING

### IE 601 - Advanced Engineering Statistics (3 cr.)

Prerequisite: Graduate Standing

This course examines model building, design of experiments, multiple regression, nonparametric techniques, contingency tables and introduction to response surfaces, decision theory and time series data.

### IE 604 - Human Factors (3 cr.)

Prerequisite: Graduate Standing

This is a study of research related to the interface of human beings and machines. Topics include human factors, product and equipment design, capabilities and limitations of the human sensory-motor system, design of displays, and interaction between individual groups and machine systems.

### IE 605 - Reliability (3 cr.)

Prerequisite: Graduate Standing

This course covers the fundamental concepts in reliability engineering. Topics include lifetime distributions, methodologies for parameter estimation, system reliability modeling, degradation modeling, accelerated life testing (ALT) modeling and planning. Most topics are data-driven and advanced analytical methods such as Bayesian statistics using Markov Chain and Monte Carlo (MCMC) for reliability analysis will also be introduced. Basic probability and statistics background is required for this course.

### IE 609 - Strategic Engineering Economics (3 cr.)

Prerequisite: Graduate Standing

Cross-Listed as: CEE 609 and EMGT 609

This course studies the economic aspects of engineering design problems. Students will learn how to comprehensively analyze the economics of engineering projects and build a strategic business case for their designs. Topics covered include the fundamental concepts of economics, game theory, the time value of money, decision making under uncertainty, and special considerations for evaluating projects with very long time horizons.

Cannot take CEE 609 and EMGT 609 for credit.

Formerly Engineering Cost Analysis.

Formerly Advanced Engineering Economics

### IE 612 - Risk Assessment (3 cr.)

Prerequisite: Graduate standing

Cross-Listed as: EMGT 702

This course provides an understanding of systems engineering and complex systems. It emphasizes the development of the fundamentals of systems engineering, engineering life cycle models and phases, systems design for operational feasibility, and an introduction to planning for systems engineering and management.

Formerly "Systems Engineering"

### IE 614 - Engineering Risk Analysis Methods (3 cr.)

Prerequisite: EMGT 602 or permission

Cross-Listed as: EMGT 704

This course develops the students understanding of risk analysis methods for engineering systems, such as infrastructure development projects for organizational and societal planning purposes. The course develops a robust foundation for qualitative and quantitative risk analysis through problem structuring, data collection and data analysis before transitioning to leveraging software packages that enhance the analyst's capabilities to model systems and understand risks within the system. It examines methods and processes of planning for, identifying, assessing, monitoring, and responding to project risk. Methods explored include fault tree development and analysis, decision tree analysis, risk modeling and simulation.

This course examines the application of engineering management technique methodology to recognize, evaluate, and make decisions regarding expenditures for the mitigation of potentially risks associated with large engineering projects. It examines methods and processes of planning for, identifying, assessing, monitoring, and responding to project risk. Quantitative risk analysis procedures, including decision free analysis, risk simulation, risk ranking, and risk responding techniques are covered.

Formerly Engineering Risk Analysis

### IE 619 - Engineering Supply Chain (3 cr.)

Prerequisite: Graduate Standing

Cross-Listed as: EMGT 619

This course will cover the theory, principles, and implications of supply chain management and is intended to provide students with an understanding of the strategic and tactical elements of supply chains. Topics include supply chain networks and design, planning supply and demand, inventory management, managing uncertainty, transportation issues, financial factors, and coordination. The focus of the class is both theoretical and practical and will include case studies.

Cannot take IE 619 and EMGT 619 for credit.

### IE 620 - Multi-Criteria Decision Analysis (3 cr.)

Prerequisite: Graduate Standing

Cross-Listed as: EMGT 620

This is a study of techniques of mathematical formulation, analysis, and solution of technical management problems and the interpretation of results. Computer applications are included.

Cannot take IE 620 and EMGT 620 for credit.

### **IE 622 - Lean Production Systems (3 cr.)**

Prerequisite: Graduate Standing

Cross-Listed as: EMGT 622

This is a study of the problems, analytical techniques, and recent developments that relate to the traditional production systems and lean production systems. Topics include forecasting, inventory control, production planning, scheduling, and the relationships between manufacturing and other functions of the firm. Emphasis is on pull/demand based production systems.

Cannot take IE 622 and EMGT 622 for credit.

### **IE 626 - Discrete Event Simulation (3 cr.)**

Prerequisite: Graduate Standing

Cross-Listed as: EMGT 626

This is a study of the computer simulation applied to queuing networks, inventory and production control, and material handling systems.

Cannot take IE 626 and EMGT 626 for credit.

### **IE 629 - Advanced Manufacturing Engineering Systems (3 cr.)**

Prerequisite: Graduate Standing

Cross-Listed as: EMGT 629

This is a study of manufacturing systems techniques with special emphasis on cost estimating, automation, group technology, expert systems, flexible assembly, cellular manufacturing, and other related special topics.

Cannot take IE 629 and EMGT 629 for credit.

### **IE 631 - Production and Inventory Modeling (3 cr.)**

Prerequisite: Graduate Standing

Cross-Listed as: EMGT 631

This course provides the theory and application of forecasting and modeling aggregate demand, fragmented demand and consumer behavior using statistical methods for analysis for services and products. Resulting models are correlated to engineering and management decisions made with respect to product, process and systems design. The theory and practice of production and inventory modeling will be covered.

Cannot take IE 631 and EMGT 631 for credit.

### **IE 635 - Operations Research (3 cr.)**

Prerequisite: Graduate Standing

Cross-Listed as: EMGT 635

This course provides the theory and application of deterministic optimization models. Topics include problem formulation, the simplex method, duality and primal dual relationships, complementary slackness, revised simplex and interior point algorithms. Solution approaches will be done traditionally and using contemporary software.

Formerly Optimization Methods I

Cannot take both IE 635 and EMGT 635 for credit.

### **IE 643 - Design of Experiments (3 cr.)**

Prerequisite: Graduate Standing

Cross-Listed as: EMGT 643

This is an overview of statistical methods for design of products and processes. Topics include experimental design and analysis, regression analysis, robust design, and Taguchi's methods. Currently popular methods are surveyed.

Cannot take IE 643 and EMGT 643 for credit.

### **IE 644 - Quality Systems and Process Improvement (3 cr.)**

Prerequisite: Graduate Standing

Cross-Listed as: EMGT 644

This is a quantitative course covering an analysis of quality system structures in industry today and the process improvement tools used in quality systems. Process and quality tools such as SPC, Gage R R, ISO 9000, 6 Sigma, benchmarking, and the Malcolm Baldrige National Quality Award are studied. The course is based on applications of these quality principles.

Cannot take IE 644 and EMGT 644 for credit.

### **IE 645 - Quantitative Models of Supply Chain Management (3 cr.)**

Prerequisite: Graduate Standing

Cross-Listed as: EMGT 645

This course will look at both fundamental and newer models in supply chain management. Topics covered include inventory theories under uncertainty, supply chain contracting and coordination, risk pooling, and stochastic decision-making.

Cannot take IE 645 and EMGT 645 for credit.

### **IE 650 - Systems Integration (3 cr.)**

Prerequisite: Graduate Standing

Cross-Listed as: EMGT 650

This course is an introduction to the relevant issues and required techniques for successful systems design development, integration, management, and implementation. The principles and methods for

system lifecycle analysis, system planning and management, systems integration, and strategic decision-making will be covered in this course. The interfaces between the system, subsystems, the environment, and people will be part of the course materials. Students will learn the factors to control the total system development process designed to ensure a high quality and effective system.

Cannot take IE 650 and EMGT 650 for credit.

### **IE 670 - AI: Applied Neural Networks and Machine Learning (3 cr.)**

Prerequisite: Graduate standing

Cross-Listed as: CPE 673, ME 670, EE 670, CEE 673

This course concentrates on application of neural networks in the field of engineering. In this course students will learn vision-based applications of Perceptron algorithm as well as back propagation. Linearly and nonlinearly separable clustering and classification problems will be covered. This course is project based and concentrates on the latest applied Neural Networks and Machine Learning algorithms. All concepts are heavily reinforced using MATLAB, the main computational platform.

Formerly "Optimal Control Systems"

### **IE 671 - AI: Machine Learning - Concepts (3 cr.)**

Prerequisite: Graduate standing

Cross-Listed as: CEE 671/ME 671/EE 671/CPE 671

This course focuses on AI concepts such as Data Exploration, Single and Multivariate Parametric and Non-Parametric methods of regression and classification tasks. Students will learn the theory that underlies these algorithms and implement them using popular machine learning packages such as Python with scikit-learn and MATLAB. During the final project, students will implement multiple algorithms and learn how to select the best algorithm with the optimized hyperparameters.

### **IE 672 - AI: Machine Learning - Applications (3 cr.)**

Prerequisite: Graduate standing

Cross-Listed as: CEE 674/ME 672/CPE 672/EE 672

This course focuses on Artificial Intelligence application packages such as Data exploration, Natural Language Processing, Support Vector Machine, Reinforcement Learning, Artificial Neural Networks (ANNs) and Computer Vision and Deep Learning. Students will learn the theory and applications of a variety of algorithms. These algorithms will be implemented using Python and MATLAB software. As the final project, students will apply a combination of algorithms to a specific application and develop an end to end solution.

### **IE 676 - AI: Applied Fuzzy Logic (3 cr.)**

Prerequisite: Graduate standing

This course covers the fundamentals of fuzzy logic theory and its applications. In this course students will learn to analyze crisp and fuzzy sets, fuzzy propositional calculus, predicate logic, fuzzy logic, fuzzy rule-based expert systems, and will learn to apply fuzzy logic theory to a variety of practical applications. Students will also learn to use MATLAB computational software to understand new concepts and to perform and implement fuzzy logic rules and systems. Machine Controls will be the application.

Formerly "Intelligent Motion Controls"

### **IE 680 - Engineering Project (3 cr.)**

Prerequisite: Graduate Standing

Students must select a project faculty advisor and obtain topic approval prior to registration for this course. This is an independent engineering project under the supervision of a project faculty advisor. The design process is emphasized. Progress reports and a final written report are required. An oral presentation and defense of the project is made before a faculty committee.

### **IE 690-691 - Special Topics in Industrial Engineering (3 cr.)**

Prerequisite: Graduate Standing

This is a study of an advanced topic in engineering of special interest to industrial engineering majors, but not carried in the catalogue on a regular basis.

### **IE 698 - Thesis Research (3 cr.)**

Prerequisite: Graduate Standing

This is a research course open to industrial engineering graduate students who have completed requirements for admission to candidacy for the master's degree. Prior to registration, written permission to enroll must be obtained from the student's advisor.

### **IE 699 - Thesis Research (3 cr.)**

Prerequisite: Graduate Standing

This is a research course open to industrial engineering graduate students who have completed requirements for admission to candidacy for the master's degree. Prior to registration, written permission to enroll must be obtained from the student's advisor.

## MAET - TEACHING ENGLISH (ALL COURSES OFFERED ONLINE)

### MAET 552 - Advanced Grammar (3 cr.)

This course reviews the rules and conventions of Standard Written English, with emphasis on the assessment and development of student writing.

### MAET 553 - Teaching Writing in the English Curriculum (3 cr.)

This course covers principles of rhetoric, including both composition theory and the application of rhetorical principles to the evaluation and development of student writing

### MAET 554 - Teaching English in the Multicultural Classroom (3 cr.)

This course focuses on the need to develop pedagogical strategies for the multicultural English classroom. Goals for the course are to develop an understanding of contrastive rhetoric, sociolinguistics, and cross-cultural communication in educational settings.

### MAET 556 - The Reading Process in the English Curriculum (3 cr.)

This course applies the hierarchy of skills in the reading process to the English curriculum. Emphasis is on a) assessing needs and approaching remedies and b) developing skill in critical analysis of literature.

### MAET 557 - Reading and Teaching Young Adult Literature (3 cr.)

Prerequisite: For students in MAET program or with permission of instructor

This course will examine the genre of young adult literature and present various approaches to some key texts. It will begin by situating YA as a genre – as well as the relatively new designation of “teenagers” as a distinct group of people, let alone as a group of readers – and go back to some nineteenth century texts that laid the foundation for contemporary YA lit. Examination will include traditional “canonical” novels, lyric novels, graphic novels, fantasy, realism, bestsellers and more “literary” YA fiction and explore the ways in which the texts present the complexities of gender, race, ethnicity, and sexuality in a world in which those concepts are shifting and for readers for whose identities are equally in flux. Many of these texts can be used in middle and high school classrooms, alone or in tandem with a more “classic” text, as will be demonstrated.

### MAET 560 - Literary Studies- Shakespeare and The Elizabethan Age (3 cr.)

This course examines representative Shakespearean plays and the culture in which they were produced. Relevant historical documents from Elizabethan and Jacobean England are studied alongside the plays, and pedagogical techniques for the teaching of Shakespeare and English Renaissance culture are both discussed and practiced.

### MAET 561 - Literary Studies- Poetry (3 cr.)

This is a comprehensive course, studying poetry with an eye towards teaching methods of interpretation. The class considers ways to make

reading poetry more rewarding and enjoyable, but it also discusses questions of form and genre, meter and scansion, the use of historical and biographical approaches in tandem with close readings, the combinations of art and music with poetry, and philosophies of the purpose of poetry. Pedagogical techniques, especially creating assignments to help students understand and write about poetry from their own experiences in writing poems, are explored.

### MAET 563 - Literary Studies- Genres (3 cr.)

Using selected texts from around the world, this course offers in-depth study of a range of literary genres and the conventions that distinguish them. Goals of the course include exploring how literary form reflects an author's purpose, how it shapes meaning, and how combining forms can uniquely express complex themes and issues. Genres studied are likely to include short stories, novels, plays, and memoirs.

### MAET 564 - Literary Studies- Cultural-Literary Connections (3 cr.)

This course examines representative works from a period of literature and studies the culture in which they were produced. Pedagogical techniques for relating literature to cultural context or historical backgrounds are discussed. This course may be repeated for credit if the topic differs.

### MAET 565 - Literary Studies- Great Works of American Literature (3 cr.)

This course examines major works from the range of American literature, along with a few lesser known works that are important for context. It introduces various tools for fundamental literary analysis.

### MAET 566 - Literary Studies- Modern American Literature (3 cr.)

This course examines works of the second half of the 20th century, with an emphasis on literature from representative American cultural groups.

### MAET 567 - Literary Studies- Twentieth Century American Poetry (3 cr.)

This course introduces students to a representative selection of modern American poetry from the mid 18th century to the present. The course will concentrate on the poetry of Dickinson, Frost, Stevens, Cummings, Hughes, Eliot, Lowell, Plath, and Collins. Students will also have the opportunity to explore the works of other poets through oral presentations and written reports and to reinforce knowledge of poetic techniques as stipulated in the Massachusetts Curriculum Frameworks.

### MAET 568 - Literature of the Harlem Renaissance (3 cr.)

Prerequisite: Enrolled in MAET program, or approval of instructor.

This course will engage in a study of African American literature from the early 1900s to the 1930s. Attention will be paid to the origins of the Harlem Renaissance, with particular focus on the political, social, and literary influences. We will address the debates that surrounded the movement, evaluating the Renaissance not only as a literary moment in Black History but also as a social movement that addressed the status and experience of Blacks in America during this time. We will read essays, novels, poetry and short stories from the movement, including but not limited to Du Bois, McKay, Hughes, Hurston, Fauset, and Larsen

**MAET 569 - Literary Theory: Sources and Application (3 cr.)**

Prerequisite: A student in good standing in MAET program, or with instructor's permission.

As teaching the reading of texts through a variety of "critical lenses" is a crucial part of both the Massachusetts grades 5-12 requirement and necessary for literary analysis in general, this course is essential. It provides the foundations of contemporary literary theories in their philosophical roots, from Aristotle to Hegel to Marx to Foucault, and examines contemporary critical lenses including Marxism, feminism, psychoanalytic criticism, deconstruction, and post-colonial critiques. Adding praxis to theory, students will apply a variety of these modes of analysis to multiple literary texts.

**MAET 570 - Capstone Project (3 cr.)**

The capstone project provides students with a broad understanding of contemporary literary theory and with the opportunity to reflect on how their coursework has impacted their teaching by producing an article-length (20-25 page) piece of literary scholarship. Students work with the chosen mentor in developing topics, which may or may not involve pedagogical issues, and in researching and writing their projects.

Formerly "Seminar: Issues in The Teaching of English"

**MAET 573 - Women Writers and Feminist Theory (3 cr.)**

This course focuses on important women writers of the twentieth and twenty-first century. Will be looking at women writers from a variety of eras, genres, approaches, and perspectives, paying special consideration to issues of gender, race, sexuality, socioeconomics, and politics, as well as feminist work in psychology, history, philosophy, and linguistics.

**MAET 575 - African American Literature (3 cr.)**

This course will utilize African American literature to trace the development of the African American Literary Tradition from one of the first novels written by a Black author to contemporary writers. Using novels, short stories, and essays, the course will explore the cultural, critical and literary perspectives that have influenced the tradition.

**MAET 590-596 - Special Topics in MAET (1-3 cr.)**

Topics offered depend upon student interests as well as particular interest of instructors. The course is offered as often as faculty time and student interest permit. May be repeated for credit if topic differs.

**MAMT - TEACHING MATHEMATICS (ALL COURSES OFFERED ONLINE)****MAMT 540 - Calculus Revisited: Theory and Applications (3 cr.)**

A review of differential and integral calculus from single-variable to multi-variable with an emphasis on theory and applications. Topics include functions, limits, continuity, differentiation, integration, infinite sequences, and infinite series. Technology will be used when appropriate.

**MAMT 542 - History of Mathematics (3 cr.)**

This course explores the mathematical contributions and progress made by civilizations and individuals over time, focusing on ancient cultures through the Middle Ages. Significant developments will be highlighted, such as the Pythagoreans' contributions to number theory, and Euclid's impact on geometry. Relevance of these developments and their historical context to today's school classrooms will be discussed.

Formerly MAMT 560

**MAMT 543 - Linear Algebra (3 cr.)**

This course is the study of the topics and techniques of linear algebra. There are many real world problems in engineering, economics, and the sciences that can be reduced to solving systems of linear equations. In the course, we shall consider the problem of solving linear systems; we shall then study matrices and determinants and the role they play in solving linear systems. Then the course turns to the study of Euclidean n-space and linear transformations, eigenvectors and eigenvalues. The course will introduce one to mathematical modeling and its role in problem solving, as well as to an axiomatic approach to studying mathematics.

Many applications will be considered throughout the course.

Formerly MAMT 562 Linear and Matrix Algebra

**MAMT 544 - Creative Problem Solving in Mathematics (3 cr.)**

How do we solve problems in mathematics? This question has many nuances, ranging from specific techniques (should one use algebra or geometry?) to general strategies (try an example!) to psychology (don't give up immediately out of intimidation). In this class we will examine the strategies, tactics, and tools of mathematical problem solving that encompass all of these nuances, as well as touch on how an awareness of problem solving can influence the way we teach mathematics. We will use many different areas of math to solve a wide variety of problems, and there will be emphasis on communicating problem solutions, both in writing and orally.

Formerly MAMT 549

**MAMT 545 - Cryptology (3 cr.)**

This course presents the history of and the mathematics behind the major developments in cryptography and cryptanalysis over the centuries. Symmetric ciphers such as monoalphabetic, polyalphabetic, and polygraphic are covered, as well as the modern-day public-key cryptosystem known as RSA. Emphasis is placed on gaining a deeper understanding of the mathematics used in these cryptographic methods and of the statistical tools for cryptanalysis.

Formerly MAMT 572

**MAMT 546 - Chance (3 cr.)**

This course focuses on quantitative literacy, using current events and how these events are reported in the media to examine fundamental statistical and probabilistic concepts. The goal of this course is to make us more informed, critical readers of current news stories, and to promote a deeper understanding of the probability and statistics that we are exposed to in everyday life. Potential current event topics include interpreting polls (including margin of error), scoring streaks, lotteries and randomness, medical research, false positives, economic indicators, statistics in the courtroom, and cancer clusters. To understand these topics fully, students will be learning aspects of graphical descriptive statistics, confidence intervals, probability,

measures of central tendency and dispersion, basic combinatorics, hypothesis testing, conditional probability, sampling, correlation, linear regression, and more.

Formerly MAMT 551

### **MAMT 547 - Statistics (3 cr.)**

This course introduces statistical thinking in applied settings, with the goal of enabling students to use such thinking in their everyday lives. Topics may include: interpretations of probability, axioms and rules of probability, independence, random variables, distributions, graphical and numerical techniques for presenting data, central limit theorem, introduction to linear regression, point estimation, and hypothesis testing. Emphasis is on understanding and interpreting, not on computations.

Formerly MAMT 558

### **MAMT 548 - What is Mathematics? (3 cr.)**

This course considers some of the greatest ideas of humankind—ideas comparable to the works of Shakespeare, Plato, and Michelangelo. The great ideas that will be explored are within the realm of mathematics. What is mathematics? Mathematics is an artistic endeavor which requires both imagination and creativity. Students will experience what mathematics is all about by delving into some beautiful and intriguing issues in such areas as topology, number theory, analysis, logic, graph theory, and probability. Although students will be challenged, the overriding theme of the course is to gain an appreciation for mathematics, to discover the power of mathematical thinking, and to have each student realize his or her own individual answer to the question "What is mathematics?"

### **MAMT 550 - Discrete Mathematics (3 cr.)**

This is an introduction to mathematical thinking with emphasis on finding patterns, making conjectures, and learning methods to solve problems and prove theorems. This is done in the context of discrete, as opposed to continuous, mathematics. The topics include sets, relations, functions, the language of mathematics, counting, graph theory, mathematical induction, cardinality, algorithms, and recursion.

### **MAMT 552 - Geometry Revisited (3 cr.)**

Most of us have studied the geometry of Euclid in a single secondary school course, but many new ideas have sprouted since his time. New topics will include transformations, isometrics, vectors, and non-Euclidean geometries. Selected classical topics of angle measurement, length, area, volume, polygons, circles, spheres, and deductive reasoning will also be included.

### **MAMT 554 - Number Theory (3 cr.)**

Prerequisite: MAMT 550 or permission of the department.

This course explores patterns and relationships between numbers, beginning with basic properties of the integers first encountered in elementary school: even and odd numbers, clock arithmetic, and divisibility tests. Generalizations of these topics, such as modular arithmetic and congruences, will be covered, along with such topics as the Euclidean algorithm, prime factorization, the greatest common divisor, linear Diophantine equations, the Chinese Remainder Theorem, and Euler's phi-function.

### **MAMT 556 - Graph Theory (3 cr.)**

Prerequisite: MAMT 550 or permission of the department.

This course is a survey of the theory of graphs and digraphs. Fundamental concepts include paths, cycles, trees, connectivity, matchings, networks, tournaments, planarity, Hamiltonian graphs, Eulerian graphs, and graph coloring. Additional topics and/or applications may be covered depending on interest.

### **MAMT 561 - Probability (3 cr.)**

Prerequisite: MAMT 550 or permission of the department.

Probability theory originated in games of chance during the late fifteenth and the early sixteenth centuries. In modern times, probability is typically coupled with statistics which requires a basic understanding of the subject, but this course will focus almost entirely on the pure probability side with reference to statistics in passing. The course begins with methods of streamlined counting known as combinatorics and moves to discrete probabilities and then on to continuous probability models. There are many interesting, classic problems in counting and probability, especially the counterintuitive ones. As a check on the classical approach, solutions to some difficult probability problems, students will use simulations in R to empirically study probability. When appropriate, we will see how to introduce some topics to middle or high school students.

### **MAMT 564 - Analysis (3 cr.)**

Prerequisite: MAMT 550 or permission of the department.

After the discovery of calculus by Newton and Leibniz in the late 17th century, many advances in the solution of difficult mathematical and physical problems became possible. In the late 19th century and early 20th century, mathematicians attempted to put calculus and the study of real numbers on firmer logical ground. In this course, students will study calculus from this more modern, rigorous viewpoint, emphasizing the important theorems and proofs that lead to a deeper understanding of calculus. Topics will include sequences, limits, continuity, differentiation, integration, and the Fundamental Theorem of Calculus.

### **MAMT 566 - Algebraic Structures (3 cr.)**

Prerequisite: MAMT 550 or MAMT 554 or permission of the department.

Elementary algebra consists of sets of real numbers and their operations with properties such as closure, commutativity, associativity, distributivity, inverses, and identity elements. At the more abstract level, algebraic structures called groups, rings, and fields have some, or all, of these properties. This course will examine algebraic structures from a general point of view, compare different structures, and study structure-preserving maps. Applications of these structures in mathematics and the applied sciences will also be introduced.

### **MAMT 568 - Mathematical Modeling (3 cr.)**

This course is an introduction to mathematical modeling. The emphasis will be on learning to analyze a real-world situation or problem, in order to distill from it important information, and to learn mathematical techniques to encode this information in equation form, and then solve the equations, interpreting the mathematical solution back in the real-world situation. Topics covered will be selected from difference equations, Markov chains, graph theory, regression analysis, and linear programming, as well as other areas depending upon the interests of the students.

### **MAMT 570 - The Mathematics of Symmetry (3 cr.)**

Prerequisite: MAMT 550 or MAMT 554 or permission of the department.

The goal of the course is to learn the rudiments of basic Group Theory through the symmetry of planar designs, both finite and infinite. Emphasis is placed on using pattern and symmetry to motivate properties of groups and on gaining mathematical sophistication by studying and doing proofs about various properties of groups.

### **MAMT 574 - Origami in Math and Education (3 cr.)**

Prerequisite: MAMT 550 or MAMT 554 or permission of the department.

Origami is the art of folding paper into intricate shapes. The rules are that the paper cannot stretch and cannot rip during the folding process. It turns out that we can study paper folding using mathematics, and in fact the relationship between origami and math runs deep. In this course students will explore the many different ways in which mathematics can be used to understand origami. This will include using geometry, combinatorics, graph theory, algebra, and matrices. At the same time it will become obvious that origami can be used to actually teach mathematics, and participants will explore how they can use paper folding in their own middle- or high-school classes. We will also explore amazing applications of origami in science and engineering, such as to deploy solar panels in outer space or to design airbags.

### **MAMT 590-593 - Special Topics in Mathematics (if designated as core) (1-3 cr.)**

Topics offered depend upon student interests as well as particular interest of instructors. The course is offered as often as faculty time and student interest permit. May be repeated for credit if topic differs.

### **MAMT 590-593 - Special Topics in Mathematics (if designated as non-core) (1-3 cr.)**

Topics offered depend upon student interests as well as particular interest of instructors. The course is offered as often as faculty time and student interest permit. May be repeated for credit if topic differs.

## **MAN - MANAGEMENT**

### **MAN 600 - Foundations of Leadership Practice (3 cr.)**

Prerequisite: Graduate standing.

This course provides an introduction to the development of individual leadership practice. This is accomplished through consideration of various theories and models of leadership as well as related skills and competencies. Key learning outcomes include: leadership models relevant to life and work; effective leadership techniques for organizational success; importance of followership to leadership; relevance of diversity to leadership.

Offered: MR

Formerly "Leadership"

### **MAN 605 - Leadership, Problem Solving and Decision Making (3 cr.)**

Prerequisite: Graduate standing.

Organizations need leaders at all levels with the capacity to identify problems and make decisions in the development and support of strategic and operational goals. This course examines the role of leaders in conjunction with different problem solving and decision

making processes for creatively addressing organizational challenges. Key learning outcomes include: explain leadership's role in individual or organizational performance; generate alternative solutions to organizational challenges or opportunities; assess the strengths and weaknesses of both rational and intuitive approaches to decision making, explain a creative problem solving process, and identify ethical considerations in problem solving and decision making.

Offered: MR

### **MAN 610 - Organizational Behavior and Theory (3 cr.)**

Prerequisite: Graduate standing.

This course examines structural and behavioral factors influencing performance in organizations. Key learning outcomes include: integration of international and cross-cultural variables relating to OB and organizational theory; analysis of the behavioral aspects of existing organizational problems; structural aspects of organizational challenges; the relevance of individual, group, and organizational dynamics; and ethical issues and challenges in organizations.

Offered: MR

### **MAN 611 - Business and its Environment (3 cr.)**

Prerequisite: Graduate standing.

Cross-Listed as: BUS 610

This course examines the social, economic, and political environment facing business and its leaders in the 21st century. Coverage includes the economic dynamics of the global marketplace, demographic trends and their impact on the organization, public policy and regulatory issues, the relationship between business and governments, and the nature of business ethics and corporate social responsibility. The goal of this course is to enhance students' ability to meet multifaceted challenges facing managers in the business environment.

Must be MBA, MBASP, MSA, MSATX, MSAFF, or MSOL student.

### **MAN 630 - Leadership and the Human Experience (3 cr.)**

Prerequisite: Graduate standing.

This course explores leadership and the human experience as it is depicted in fiction, biography, drama and film in order to better understand the historical and social construction of leadership theory and practice. Key learning outcomes include: an appreciation for the historical nature of leadership theory and practice, increased awareness of the value of literature and film in framing effective leadership practices; differences among successful-and unsuccessful leadership styles; areas of strength and deficiency in personal leadership styles; humanistic principles in analyzing ethical conflicts in leadership and management situations; leadership/management challenges such as initiative, planning, and assessment of calculated risk-taking; decision-making utilizing non-traditional learning sources in everyday leadership opportunities.

Distribution: MR

Formerly "A Humanistic Approach to Leadership and Management"

### **MAN 631 - Human Resource Management (3 cr.)**

Prerequisite: Graduate standing.



This course considers the management of human resources in an enterprise. Key learning outcomes include: managerial decision-making that recognizes the strategic role of HRM; legal issues associated with HR activities such as selection and compensation; effective hiring practices in training; setting and administration of compensation levels; effectiveness of pay for performance systems; performance appraisal systems; theories of job design; and the motivational impact of jobs.

### **MAN 632 - Diversity in the Workplace (3 cr.)**

Prerequisite: Graduate standing.

This course examines issues related to managing and being a member of an increasingly diverse workforce. Diversity in the workplace may result from differences in individual characteristics such as gender, race, ethnicity, national origin, age, religion, physical ability/disability, and sexual orientation. Organizations that wish to be successful must address diversity issues in some manner in order to compete effectively in a global economy. The goal of this course is for students to learn to manage a pluralistic work force in such a way as to maximize personal and organizational goals while preserving integrity and taking advantage of the contributions of all members of the workforce. Key learning outcomes include: legal, moral and business arguments for effective management of workplace diversity, theoretical perspectives at the individual, interpersonal and macro-structural level used to analyze issues associated with workplace diversity, human resource strategies to effectively manage workforce diversity, the role of power and privilege in issues of workplace diversity, evaluate the effectiveness of diversity training.

### **MAN 633 - International Management (3 cr.)**

Prerequisite: Graduate standing.

This course focuses on dynamic changes in international business environments and increased foreign competition that challenge managers. Key learning outcomes include international trade theories; foreign direct investments and barriers to international trade; economic, social, political, and technological issues and their impact on global companies; increased foreign competition and economic integration pacts; cost and benefits of global corporations; strategies and structures of global corporations; cultural and ethical issues related to global corporations; and issues of market expansion.

### **MAN 640 - Management and Conflict Resolution (3 cr.)**

Prerequisite: Graduate standing.

This course provides an overview of the broad range of conflict situations that occur in organizations, including employee-relations issues. Key learning outcomes focus on conflict resolution processes including grievance procedures, alternative dispute resolution (ADR), and other conflict resolution strategies. Managerial practices and current trends are explored.

### **MAN 642 - Leading Change (3 cr.)**

Prerequisite: Graduate standing or admission to leadership certificate program.

This course examines the nature of organizational change and the role of leadership in that process. Key learning outcomes include: understanding the nature of different change models, creating a common vision of change in an organization, the roles of organizational culture and organizational development in change efforts

Offered: MR

### **MAN 645 - Methods of Organizational Research (3 cr.)**

Prerequisite: Graduate standing.

This course introduces students to various quantitative and qualitative research methods used to study organizational life. The intent of the course is to provide students with an understanding of the underlying philosophies and approaches pursued by organizational researchers and different methodological approaches for investigating organizational research questions. Key learning outcomes include: different approaches to organizational research and their underlying philosophical assumptions, methodologies suitable for investigating different types of research questions, the meaning of important statistical indicators featured in quantitative analyses, the main features of different qualitative methods, and the ability to evaluate organizational research in published studies.

Offered: MR

### **MAN 647 - Applied Research Project (3 cr.)**

Prerequisite: Graduate standing, MAN 645 & MAN 680.

This course builds on the foundations of MAN 645 Methods of Organizational Research and MAN 680 Current Industry Issues to provide students with the opportunity to do original research on an organizational leadership topic relevant to the student's industry focus. During the course, students will identify a current issue suitable for study, develop the research design, conduct data collection, analyze data collected, and report their findings.

### **MAN 651 - Ethical Leadership Practice (3 cr.)**

Prerequisite: Graduate standing or admission to certificate program.

This course focuses on the inevitable moral dilemmas and ethical responsibilities that face business leaders and addresses the basis for personal action. Students will use ethical frameworks to analyze actions of organizational members with respect to their stakeholders. Learning outcomes include: the nature of values conflicts, the role of reframing in ethical conduct, various options for correcting a course of action, and a personal code of ethics.

Offered: MR

### **MAN 652 - Contemporary Issues in Leadership (3 cr.)**

Prerequisite: Graduate standing or admission to certificate program.

This course examines current issues in leadership practice. Topics may include leading for creativity, leading for sustainability, leading in the electronic age, leading a diverse workforce, and leadership as it relates to particular industries or domains such as health care, non-profits, education, etc. Course content and topics will vary.

Distribution: MR

### **MAN 680 - Current Industry Issues (3 cr.)**

Prerequisite: Graduate standing.

This course examines current issues within an industry. Industries offered depend upon student interests as well as faculty expertise. The course is offered as often as faculty time and student interest permit. May be repeated for credit if industry focus differs.

### **MAN 690 - Special Topics in Management (1-3 cr.)**

Topics offered depend upon student interests as well as particular interest of instructors. The course is offered as often as faculty time and student interest permit. May be repeated for credit if topic differs.

**MATH - Mathematics****MATH 591 - Special Topics in Mathematics (1-3 cr.)**

Prerequisite: Graduate standing

Topics offered depend upon student interests as well as particular interests of instructors. The course is offered as often as faculty time and student interest permit. May be repeated for credit if topic differs.

**ME - MECHANICAL ENGINEERING****ME 526 - Gas Dynamics (3 cr.)**

Prerequisite: ME 303 and ME 316

Cross-Listed as: ME 426

This course introduces students to the analysis and design procedures currently used for solving engineering problems in compressible fluid flow. Students learn how to combine the concepts of dynamics, thermodynamics, and fluid mechanics to generate useful analyses for the design of fluid machinery. Students use control volume theory and several derived compressible flow analyses to develop design procedures for wind tunnels, exhaust pipe tuning, aircraft inlets and nozzles, shock tubes, and gas turbines. Several case studies encompassing contemporary design problems from industry are used in the classroom to enhance the learning process. An individual design project using these methods is assigned. The method of assessing students includes classroom participation, homework assignments, examinations, and a final exam.

**ME 610 - Measurement Systems (3 cr.)**

Prerequisite: ME 320, ME 435, or equivalent.

This graduate course is offered to mechanical engineering majors and is designed to familiarize students with electronic instrumentation and mechanical measurement techniques. Students will be able to make accurate and meaningful measurements of mechanical and thermal quantities such as strain, force, displacement, torque, pressure, velocity, acceleration, flow, volume flow rate, and temperature. Signal conditioning and data collection and reduction techniques are presented and the use of PC based data acquisition and control systems for automated data collection are emphasized. Case studies of practical significance or related to innovative sensor design and implementation are discussed and demonstrated. Each student will conduct an independent design project related to an area of mechanical testing or measurement and submit a final written report. The method of assessing students includes examinations, the project report, and a final exam.

**ME 619 - Experimental and Analytical Stress Analysis (3 cr.)**

Prerequisite: ME 208 and MATH 350, or equivalent.

This advanced course builds on the material presented in Mechanics of Materials course and develops the students ability to apply the principles of advanced mechanics of materials to problem solving while applying common experimental techniques for solution verification. The analytic studies will allow students to determine shear centers of composite sections; determine stresses and deflections of curved beams and beams on elastic foundations; determine deflection and slope in beams using Castigliano's theorem; determine stresses in thick walled cylinders; and determine stresses in initially curved and eccentrically loaded columns. The experimental studies include the basic theory and installation techniques of electric resistance strain gauges, photoelastic coatings, and applications of

load and deflection measuring techniques. Applications of these techniques in the verification of analytical solutions is emphasized throughout the course. A project involving the use of analytical and experimental verification methods is required. Methods of assessing students include homework assignments, laboratory reports, quizzes, a midterm, and a comprehensive final exam.

**ME 620 - Applied Mechanical Design (3 cr.)**

Prerequisite: ME 425 or equivalent or permission of instructor.

This graduate level course is offered to engineering graduate students who have taken an undergraduate course in machine design. The course is conducted entirely off campus using the Internet and conference calling as the primary modes of delivery. The course is designed to build on concepts introduced in a senior level undergraduate machine design course and utilizes a series of design projects which apply the design theory presented in class. Topics include theories of static and fatigue failure; statistical techniques used to predict component reliability; extension, compression, and torsion spring design for static and fatigue loading; roller contact bearings and lubrication; clutches and brakes; and flexible drive systems. Design of complex components and assemblies, and the development of engineering product specifications is introduced, and the impacts of social, economic, and material constraints on the design process are also considered. The methods of assessing students include a midterm and a final examination, and a number of machine design projects. A substantial final design project will be required by all students. Students will use advanced design principles to design and build a scale model which will be tested for performance. Testing of the model will be captured using avi files which will be submitted via Kodiak.

**ME 626 - Advanced Fluid Mechanics I (3 cr.)**

Prerequisite: ME 303, ME 316, and graduate standing.

This course presents concepts and methods of fluid dynamics applicable to engineering problem solution. Topics include: the continuum concept, control volume theory, the Navier-Stokes equation, boundary layer analyses, vorticity and circulation, lift and propulsion, dimensional analysis procedures, Reynolds number significance, viscous dominated flow, and unsteady flow and wave theory. Numerous practical and current engineering applications will be presented and discussed in detail.

Formerly "Applications of Advanced Fluid Mechanics"

**ME 631 - Piezo-electricity and Transducers (3 cr.)**

Prerequisite: Introduction to DC and AC electronic circuits; introduction to mechanical statics and dynamics.

This course introduces the complex and multidisciplinary subject of piezoelectric transducers and their applications. The core topics covered in the course are the piezoelectric electric effect, the physical attributes of the effect with the corresponding engineering models, transducer structures that take advantage of certain piezoelectric properties, and methods of using the transducer in such things as ultra-sonic and sensing applications. Upon successful completion of this course, students should have a firm understanding of piezoelectric behavior and the methods that can be used to make use of that behavior.

Methods of assessment include homework, quizzes, and exams.

**ME 632 - Fundamentals of Flight (3 cr.)**

Prerequisite: ME 426, ME 447, or permission of instructor.

This course is an introduction to the fundamentals of flight, with a more advanced focus on engineering aspects of flight. Topics include basic aerodynamics of sub-sonic, trans-sonic and super-sonic flight, airfoil and wing design, airplane performance at various flight attitudes and conditions, and aircraft stability and control. Aerodynamic concepts discussed in the classroom are confirmed by conducting several laboratory experiments in a sub-sonic wind tunnel. A flight simulator is also used to demonstrate basic fundamentals of flight. The methods of assessing students include homework, quizzes, examinations, classroom discussions, laboratory experiments, a team-based aerodynamic design project, and a final exam.

### **ME 635 - Design of Alternative Energy Systems (3 cr.)**

Prerequisite: ME 417 or both ME 303 and graduate standing.

This course is an introduction to the theory and design of solar, water, wind, and geothermal power generation systems. Students will become familiar with flat-plate collector performance, practical considerations for flat-plate collectors, estimation of residential heating and cooling loads, and thermal design methods. A project involving the design of an energy independent home is assigned. The methods of assessing students include homework, quizzes, a midterm exam, design project report, and a final exam.

### **ME 640 - Materials Selection for Engineering Design and Manufacturing (3 cr.)**

Prerequisite: ME 309 or equivalent or permission of instructor.

The course will develop a systemic approach for the development of a new idea or product and facilitate the continuous improvement processes for products currently on the market. The approach is based on evaluating open-ended design problems with respect to the interrelationship between material, shape, function, and processes used to produce a variety of products. In the course, the general characteristics of a wide variety of materials including metals, ceramics, polymers, and composites, will be explored using the materials selection process. Case studies and team projects will focus on materials selection decisions with multiple constraints and based on the factors involved in materials processing and information from several databases. The methods of assessing students include homework, quizzes, and design project reports.

### **ME 642 - Numerical Simulation of Acoustics and Fluid Dynamics (3 cr.)**

This course introduces the finite element method as a numerical simulation tool for the prediction of acoustic fields. COMSOLTM is used to teach the multi-physics simulations of ultrasound waves generated by piezo-electric transducers. Coupled piezo-electric, pressure acoustics and viscoelastic physics models are coupled to simulate the generation of ultrasonic waves by transducers and the interaction with boundaries. Postprocessing of the linear acoustic field to calculate acoustic radiation forces and acoustic streaming is introduced. A second topic is the teaching of multi-phase computational fluid dynamics simulations to model fluidized beds. Acoustic fluidized beds are important acoustic cell processing tools and its applications and operations are discussed.

### **ME 646 - Applied Finite Element Analysis (3 cr.)**

Prerequisite: Baccalaureate degree in mechanical, civil, or aeronautical engineering, or permission or instructor.

This graduate course is intended to assist engineers in understanding and applying the concept of the finite element modeling and analysis (FEA). Students may use commercially available FEA packages to perform linear and non-linear static, transient and steady thermal analyses but the course will be taught using ANSYS with some NX support. The finite element uses of beam theory, natural frequencies, and heat transfer will be investigated. Practical application of the FEA results are emphasized. Civil Engineering students will be given the opportunity to study structural composites like reinforced concrete or soils in class. Case studies of practical significance and innovative modeling techniques are discussed and demonstrated. Each student will conduct a comprehensive, independent, finite element analyses on a topic related to a mechanical or civil engineering design and submit a final written report. The method of assessing student progress includes in-class examinations, homework, participation, and the final project/exam/report.

### **ME 651 - Applied Computational Fluid Dynamics (3 cr.)**

Prerequisite: ME 304, ME 316, and graduate standing.

This course provides an introduction to the use of commercial Computational Fluid Dynamics (CFD) codes to analyze flow and heat transfer in problems of practical engineering interest. The course includes an introduction to the conservation equations of fluid dynamics and simple finite difference and finite volume models of one and two dimensional flows. These simple equations are used to demonstrate important features of more complex flows and to give the student an appreciation for the parameters that limit the accuracy of CFD solutions. The bulk of the course aims at using FLUENT which is a commercial CFD code, to solve engineering problems. Students learn the steps involved in performing a CFD simulations, i.e., generating a model, creating a grid, applying appropriate boundary conditions, specifying solution parameters, getting a solution, and post-processing the results for visualization. A brief introduction to turbulence modeling is also included. Students will then practice using FLUENT through solving practical flow problems such as pipe flow, jet flow, and flow over wings. The method of assessing students includes homework, quizzes, a midterm exam, design project report, and a final exam.

### **ME 654 - Computer Control of Manufacturing (3 cr.)**

Prerequisite: Graduate standing.

This is an introduction to NC systems. Topics include point-to-point positioning control and continuous path contouring control, interpolation methods, actuating devices and sensors, digital computer interfaces (A to D, D to A, D to D), position and velocity feedback control loops, and programmable logic controllers. The methods of assessing students include homework, quizzes, a midterm exam, design project report, and a final exam.

### **ME 655 - Design of Mechatronic Systems (3 cr.)**

Prerequisite: Graduate standing.

This graduate/undergraduate is intended to provide students with skills needed to design, model, validate, and control complete PC or PLC-based mechatronic systems, constructed with modern intelligent sensors, signal conditioners, pneumatic and hydraulic actuators, servo or stepper motors, PLC or embedded microcontrollers, and intelligent PID channels. Visual Basic is used for control and analysis of PC-based mechatronic systems.

Formerly ME 555.

### **ME 656 - Advanced Mechatronics (3 cr.)**

Prerequisite: Graduate standing or permission.

Cross-Listed as: ME 455

This course studies Mechatronics at an advanced theoretical and practical level. Balance between theory/analysis and hardware implementation is emphasized; physical understanding is stressed through various case-studies. Topics covered include: mechatronics system design, modeling and analysis of dynamic systems, system identification techniques, vision-based measurement and inspection systems, analog and digital sensors and their interface to actuators and controllers, and real-time programming for control. Advanced motion control topics such as master/slave drives, electronic gearing and electronic CAM, adaptive tuning of PID controllers are discussed and demonstrated.

### **ME 660 - Acoustics I (3 cr.)**

Prerequisite: Graduate standing or permission.

This course introduces the concepts and fundamentals of physical acoustics. Acoustics deals with waves at all frequencies in all substances, i.e., solid, liquid, and gas. This course is a first course into acoustics. Topics include: Introduction to waves, Reflection and transmission, Normal incidence: steady state analysis, Transmission: oblique incidence, Normal modes: strings, membranes, rooms, and waveguides, Horns, Stratified media, Dissipative fluids, Acousto-Fluidics.

Students will be evaluated on their performance on homework assignments and exams.

### **ME 661 - Acoustics II (3 cr.)**

Prerequisite: ME 660

This course further introduces the fundamental concepts of physical acoustics. Topics include a rigorous development of the wave equation, spherical and cylindrical waves, advanced waveguides, baffled piston radiation, diffraction and arrays. Additional topics related to acoustic radiation forces and acoustic streaming with applications to acoustic cell processing are introduced.

### **ME 663 - Bioprocessing (3 cr.)**

Prerequisite: Graduate standing or permission.

This course introduces cell and gene therapy manufacturing for non-biologists. The topics will include:

- Fundamentals of Cell biology
- Protein bioreactions
- Cell isolation and selection methods
- Cell expansion and differentiation methods
- Cell washing, formulation and cryopreservation
- Quality attributes, Process parameters and DOEs
- Process modelling
- CAR T-cell manufacturing

These topics will be illustrated with practical examples which will include stem cells, T cells and cell lines in the context of biopharmaceutical and cell and gene therapy manufacturing.

### **ME 670 - AI: Applied Neural Networks and Machine Learning (3 cr.)**

Prerequisite: Graduate standing

Cross-Listed as: CPE 673, EE 670, IE 670, CEE 673

This course concentrates on application of neural networks in the field of engineering. In this course students will learn vision-based applications of Perceptron algorithm as well as back propagation. Linearly and nonlinearly separable clustering and classification problems will be covered. This course is project based and concentrates on the latest applied Neural Networks and Machine Learning algorithms. All concepts are heavily reinforced using MATLAB, the main computational platform.

Formerly "Optimal Control Systems"

### **ME 671 - AI: Machine Learning - Concepts (3 cr.)**

Prerequisite: Graduate standing

Cross-Listed as: CEE 671/EE 671/CPE 671/IE 671

This course focuses on AI concepts such as Data Exploration, Single and Multivariate Parametric and Non-Parametric methods of regression and classification tasks. Students will learn the theory that underlies these algorithms and implement them using popular machine learning packages such as Python with scikit-learn and MATLAB. During the final project, students will implement multiple algorithms and learn how to select the best algorithm with the optimized hyperparameters.

### **ME 672 - AI: Machine Learning - Applications (3 cr.)**

Prerequisite: Graduate standing

Cross-Listed as: CEE 674/EE 672/CPE 672/IE 672

This course focuses on Artificial Intelligence application packages such as Data exploration, Natural Language Processing, Support Vector Machine, Reinforcement Learning, Artificial Neural Networks (ANNs) and Computer Vision and Deep Learning. Students will learn the theory and applications of a variety of algorithms. These algorithms will be implemented using Python and MATLAB software. As the final project, students will apply a combination of algorithms to a specific application and develop an end to end solution.

### **ME 674 - Acoustics and Bioprocessing Instrumentation and Measurement (3 cr.)**

Prerequisite: Graduate standing or permission of instructor

This course is designed for graduate students in Mechanical engineering, Electrical engineering, Biomedical engineering, and Physics. The course will focus on biomedical applications of ultrasound and the corresponding measurement techniques. A treatise of basic underwater acoustics and signal processing will be provided in the beginning of the course.

Hands-on laboratory experiments and exercises will supplement the lectures.

### **ME 676 - AI: Applied Fuzzy Logic (3 cr.)**

Prerequisite: Graduate standing

This course covers the fundamentals of fuzzy logic theory and its applications. In this course students will learn to analyze crisp and fuzzy sets, fuzzy propositional calculus, predicate logic, fuzzy logic, fuzzy rule-based expert systems, and will learn to apply fuzzy logic theory to a variety of practical applications. Students will also learn to use MATLAB computational software to understand new concepts and to perform and implement fuzzy logic rules and systems. Machine Controls will be the application.

Formerly "Intelligent Motion Controls"

### **ME 685 - Mechanical Engineering Project (3 cr.)**

Prerequisite: EMGT 605 or EMGT 648 and 12 credit hours minimum in the program.

Students must select a project faculty advisor and obtain topic approval prior to registration for this course. This is an independent engineering project under the supervision of a project faculty advisor. The design process is emphasized. Progress reports and a final written report are required. An oral presentation and defense of the project is made before a faculty committee.

Course may be repeated 3 times.

### **ME 690 - 694 - Special Topics in Mechanical Engineering (3 cr.)**

This is a study of an advanced topic in engineering of special interest to mechanical engineering majors.

### **ME 698 - Thesis Research (3 cr.)**

Cross-Listed as: ME 699

This is a research course open to mechanical engineering graduate students who have completed requirements for admission to candidacy for the master's degree. Prior to registration, written permission to enroll must be obtained from the student's advisor.

### **ME 699 - Thesis Research (3 cr.)**

Cross-Listed as: ME 698

This is a research course open to mechanical engineering graduate students who have completed requirements for admission to candidacy for the master's degree. Prior to registration, written permission to enroll must be obtained from the student's advisor.

### **ME 701 - Seminar / Research Methods for Mechanical Engineering (3 cr.)**

Prerequisite: Enrollment as ME Ph.D. Student

This course provides tools and techniques employed to be used in Mechanical Engineering research. Topics covered include: program/faculty overview, literature review methods and tools, hierarchy of research questions, research ethics, and visual display of quantitative information.

### **ME 714 - Composite Materials Design and Manufacturing (3 cr.)**

Prerequisite: ME 208 & ME 309 or equivalent

Composite applications have grown exponentially in the last decade due to manufacturing and materials advances. This course will serve as an introduction to composite materials selection and architecture dictating mechanical and thermomechanical behavior. This course is intended to introduce continuous fiber reinforced composites having polymer, ceramic and carbon matrices. The focus will be on

applications that include aerospace, energy, automotive, medical, research, manufacturing and marine.

As the demand for high-performance materials with superior properties and performance, flexibility and resilience grows, a new design paradigm from the molecular scale upwards has revolutionized our ability to create novel materials. This course covers the science, technology (fabrication technologies) and state-of-the-art in atomistic, molecular and multiscale design on composites material's performance.

### **ME 726 - Design of Heat Exchangers (3 cr.)**

Prerequisite: ME 322 or equivalent, and graduate standing.

This course will be offered in fall 2019 and in the Department of Mechanical Engineering with an intent to teach principles of heat exchanger design. The course focuses on principles of heat transfer and fluid mechanics (pressure drop) in design of heat exchangers. Different heat exchanger types along with analysis of heat exchangers will be discussed in this course. In particular, the effectiveness of heat exchangers based on the number of transfer units (NTU) method will be discussed.

Although the emphasize will be on heat exchangers with separation of hot and cold fluids by a stationary wall, evaporative heat exchangers which involve direct contact between a liquid and a gas will be studied as well. In addition to heat exchanger, heat pipes and vapor chambers will be reviewed.

### **ME 747 - Advanced Manufacturing and Materials Processing (3 cr.)**

Prerequisite: ME 322 or equivalent, and graduate standing.

This course introduces the fundamental principles and recent developments in the fast-growing field of advanced manufacturing, which includes additive manufacturing, microfabrication, fiber manufacturing, laser materials processing, smart manufacturing and nanomanufacturing. Emphasis will be laid on the underlying physics and limitations of existing technologies leading to methodologies for new process and product innovations. Laboratory experience will complement the lectures with the demonstration of in-house manufacturing of glass coated metal microwires with applications in electronics, energy and biomedical industries. Each student will submit a design project proposal utilizing the microwires and knowledge learned in this course to address an unmet societal need. The methods of assessing students include homework assignments, quizzes, and the final project proposal.

### **ME 752 - Applied Computational Fluid Dynamics and Numerical Heat Transfer (3 cr.)**

Prerequisite: ME 304, ME 316, and graduate standing.

This course teaches the students the basics of developing and applying computational methods for solving problems of fluid flow and heat transfer. It covers both fundamental theory and application of the techniques to develop practical fluid flow software. In addition, you will be also using one of the commercial fluid flow software to solve industrially relevant flow problems. This course adopted a project-based approach. The students will develop and use projects to learn and apply CFD. Each project can take two to three weeks depending on complexity. The objective of the course is to expose

students to fundamentals of computational fluid dynamics and heat transfer, to make students confident of developing as well as using software for computational fluid dynamics, to make students familiar with simulation of complex fluid flows with complex boundary shapes and boundary conditions.

### **ME 755 - Machine Vision (3 cr.)**

Prerequisite: Graduate standing

Machine Vision deals with the use of image processing and computer vision techniques for industrial applications. Some of the applications of machine vision in industries are liquid level inspection in bottling plant, 2D/3D bar code reading, checking dimensional accuracy and geometrical tolerances of parts, vision guided robotic pick and place application, and part defects detection such as cracks, holes, scratches etc. The objective of the course is to study and present applications of machine vision using the basic algorithms, representations, and methods of image processing and computer vision techniques.

Machine vision algorithms automatically extract the information from image and video data. At the low level, techniques such as image enhancement, histogram processing, spatial and frequency-domain filtering, segmentation, edge extraction, and corner operators are applied as the first step. Following this, higher level techniques such as geometric primitive extraction and object recognition can be applied to determine the identity and accurate location of objects in images.

Topics include: fundamental of image processing, applications, image acquisition, image enhancement in spatial and frequency domain, segmentation, thresholding, morphological image processing and feature extraction. In addition to the theoretical and mathematical underpinnings of image processing and computer vision techniques, there is a very practical aspect to the course, and many of the concepts covered in the lecture are followed with concrete programming assignments and projects.

### **ME 755 - Advanced Robotics (3 cr.)**

Prerequisite: Graduate standing

Industrial automation has become increasingly more prominent in many industries, such as manufacturing, pharmaceuticals, and food. Industrial robots are capable of various tasks like material handling, machining, palletizing, arc welding, or laser cutting. This course focuses on programming and applications of industrial robots into modern day automation industries. Fanuc LR Mate robot is used as an industrial robot for material handling and robot operations programming. The course covers the tasks that an engineer or programmer needs to setup, record and/or troubleshoot programs on a FANUC Robot using Handling Tool Software. Students will be also introduced to ROBOGUIDE, Fanuc's virtual robot programming software. Topics include, power up and jogging the robot, frames, motion instructions, coordinate systems, fault recovery, file management and back up, MACROS, programming for material handling tasks, Monitoring input and output signals.

### **ME 765 - Special Topics in Engineering Management (1-3 cr.)**

Prerequisite: Graduate standing and permission of instructor.

Topics in Mechanical Engineering that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **ME 766 - Special Topics in Engineering Management (1-3 cr.)**

Prerequisite: Graduate standing and permission of instructor.

Topics in Mechanical Engineering that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **ME 767 - Special Topics in Engineering Management (1-3 cr.)**

Prerequisite: Graduate standing and permission of instructor.

Topics in Mechanical Engineering that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **ME 768 - Special Topics in Engineering Management (1-3 cr.)**

Prerequisite: Graduate standing and permission of instructor.

Topics in Mechanical Engineering that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **ME 769 - Special Topics in Engineering Management (1-3 cr.)**

Prerequisite: Graduate standing and permission of instructor.

Topics in Mechanical Engineering that are not offered on a regular basis are examined. The course may be repeated for credit if the topic varies.

### **ME 770-799 - Dissertation Research (1-3 cr.)**

Prerequisite: EMGT 701.

This course will provide the structure for designing, conducting, writing, and presenting dissertation research. Students will meet individually with the dissertation. Discussion, presentation and guidance of the dissertation research will take place during these research meetings.

### **ME 782 - Advanced Energy Systems (3 cr.)**

Prerequisite: Graduate standing

This course covers modern energy systems with a focus on electrochemical energy conversion and storage devices including fuel cells, li-po batteries, and flow batteries among others. The course will include relevant units on thermodynamics, charge & mass transport, fluid mechanics, and electrochemistry. Students will engage in classroom lectures as well lab modules that include cell design & assembly, as well as cell performance testing. Students are expected to have undergraduate experience in Calc 1-3, Linear Algebra, and Differential Equations. Grading is based on attendance, HW sets, and a project.

### **ME 784 - Applied Design and Analysis with Composites (3 cr.)**

Prerequisite: Graduate standing

This applied graduate course is intended to assist engineers in understanding how to design and analyze structures made of composites. Students are exposed to comprehensive efforts of MILK-HNDBK17, the basics of laminated media, matrix algebra, a

variety of composites including those for civil engineering applications, and a majority of the class emphasizes spreadsheets, Ashby Charts, and ANSYS to design and analyze structures. Students may use other commercially available FEA packages to perform linear and non-linear static, and steady thermal analyses but the course will emphasize ANSYS. Practical sources of information are provided and application of the FEA results are emphasized. Civil Engineering students will be given the opportunity to study large structures and reinforced concrete as an orthotropic material and on a meso-mechanical basis. Case studies of practical significance and innovative modeling techniques are discussed and demonstrated. The method of assessing student progress includes in-class examinations and finite element results.

### **ME 798 - Thesis Research (3 cr.)**

Cross-Listed as: ME 699

This is a research course open to mechanical engineering graduate students who have completed requirements for admission to candidacy for the master's degree. Prior to registration, written permission to enroll must be obtained from the student's advisor.

## **MK - MARKETING**

### **MK 640 - Marketing Management (3 cr.)**

Prerequisite: Graduate Standing

This course explores marketing management issues that challenge managers in today's organizations. The course focuses on the analysis, planning, and decision-making processes required of marketing managers to develop successful marketing plans and strategies. Interactive case studies and/or computer simulations are used to provide a dynamic learning environment. Topics studied include customer and competitor analysis, technological and regulatory issues, marketing plan development, product development, pricing decisions, promotion strategy, and distribution management. The course also integrates current issues facing businesses today including e-commerce, international, and ethics topics.

## **OTD - OCCUPATIONAL THERAPY**

### **OTD 500 - Occupational Therapy/Occupational Science (2 crs.)**

Prerequisite: Admission to the OTD program

This course introduces key concepts related to occupational therapy and occupational science, including the study of the role of occupation in the profession and the innate desire for humans to engage in meaningful and purposeful occupations throughout life. In addition, the history and guiding philosophy of occupational therapy will be introduced, as well as the principles and theories guiding practice. Key legislation and professional documents, including the OT Practice Framework, Code of Ethics, Standards of Practice, etc., will be introduced and established as frameworks for practice. Requirements for licensure and certification will also be introduced.

formerly Occupational Science/Occupational Therapy

### **OTD 504 - Foundations of Occupational Therapy Practice (2 crs.)**

Prerequisite: Admission to the OTD program

This course covers the fundamentals of occupational therapy practice, including universal precautions, body mechanics, vital sign

monitoring, patient/client handling and transfer techniques, functional mobility, and use of assistive devices including wheelchairs. Throughout the course, there is a focus on maintaining safety within all contexts and with all patient/client care.

### **OTD 505 - Neuroanatomy and Neurophysiology (3 crs.)**

Prerequisite: Admission to the OTD program

This course covers the anatomy and physiology of the adult nervous system as a foundation for the evaluation, interpretation, and treatment of clients with disorders of the nervous system. The basic structure and function of the nervous system will be covered, with an emphasis on the implications of neurological impairments and the role of occupational therapy is addressing dysfunction in occupational performance.

### **OTD 506 - Group Interventions & Therapeutic Use of Self (2 crs.)**

Prerequisite: Admission to the OTD program

This course focuses on group and individual treatment methodologies in mental health and psychosocial settings. Using the OTPF as a guide, students will learn a variety of psychosocial treatment methods, including those addressing the areas of social skills, relaxation, cognition, sensory integration, and other areas. These methodologies and intervention techniques are considered in a variety of settings, including inpatient, outpatient, and community-based. The course also focuses on the group process and the relationship of the self to the group. Group dynamics/group development is also emphasized, including group stages, leadership roles, conflict resolution, and problem solving. Therapeutic use of self is woven throughout the course as a therapeutic tool in occupational therapy.

Cannot receive credit if taken former OTD 520 3 credit Therapeutic Use of Self and Group Intervention

### **OTD 509 - Functional Anatomy & Kinesiology (4 crs.)**

Prerequisite: Admission to the OTD program

This course will review the basics of skeletal and musculoskeletal anatomy as they relate to the biomechanics of human movement. The anatomical, physiological, and mechanical principles of movement will be analyzed and evaluated relative to occupational performance. Students will conduct physical and occupational analyses of human movement using biomechanical assessment methods including goniometry, manual muscle testing, and grip and pinch measurements. Students will examine major joint movements and consider the physical forces that influence human movement and functional performance. The course material will be presented via lecture and will be supplemented with hands-on laboratory experiences that include the use of: anatomical models; online videos; live demonstration and hands-on practice sessions with peers.

Cannot receive credit if taken former OTD 510 3 credit Kinesiology

### **OTD 510 - Kinesiology (3 crs.)**

Prerequisite: Admission to the OTD program

This course introduces the concepts of biomechanics and kinesiology as they relate to human movement. The anatomical, physiological, and mechanical principles of movement will be analyzed and evaluated relative to occupational performance. Students will conduct physical and occupational analyses of human movement using biomechanical methodologies including goniometry, manual muscle testing, as well as grip and pinch measurements. Students will examine major joint movements and consider the physical forces that influence human movement. The course material will be presented in lecture/laboratory format and be supplemented with hands-on sessions, practicing skills with peers, using anatomical models, skeletal material, and online videos.

### **OTD 511 - Evaluation: Theory and Assessment Measures (2 crs.)**

Prerequisite: Admission to the OTD program

In this course, students will be introduced to general concepts related to the theory and development of assessment tools/measures used for occupational therapy evaluation. Students will learn about various types of assessment tools and methods (standardized, non-standardized, ethnographic, interview, observation, survey/questionnaire, etc.), as well as the psychometric properties of and methodological research for assessment tools. Through the use of case studies, students will understand the use of clinical reasoning in the choice of assessment strategies and tools. Principles of administration and scoring will be covered, as well as challenges in the use of specific measures, including cultural bias. Students will practice interpreting test results and writing sections of an evaluation.

### **OTD 512 - Evaluation: Occupational Profile and Analysis of Occupations (2 crs.)**

Prerequisite: Admission to the OTD program

This course focuses on using a top down approach to evaluation by assessing clients' abilities to engage in desired roles and activities in their primary environments (home, school, work, and the community). Students will learn methods of developing client occupational profiles using specific measures (COPM, KELS, etc.) designed to understand the meaning of occupation in maintaining occupational identity, the value of occupation, and the components of occupational performance related to functional participation. Students will learn to identify meaningful occupations, as well as the barriers to participation in these occupations through activity analysis. Throughout this course, students will learn to grade/adapt activities to meet client-centered goals and abilities. Finally, students will learn how to incorporate this information into formally documented occupational therapy evaluations.

### **OTD 514 - Adult & Aging Practice I (4 crs.)**

Prerequisite: Admission to the OTD program

This course is focused on evaluation and intervention in medical, rehabilitation, and post-acute settings for patients/clients with medical and neurological diagnoses and conditions. Theories and models of practice appropriate to diagnosis and practice setting guides the selection and use of evidence-based assessment tools,

intervention methods, and assistive technology. The course also stresses ethical practice and the use of precautions with this population in these settings, as well as screening, evaluation, intervention, documentation, and discharge appropriate to setting and client's occupational needs. Content relevant to legislative, legal, political, economic, and management/billing considerations for these service delivery areas is also covered.

### **OTD 517 - Occupational Performance: Mental Health (4 crs.)**

Prerequisite: Admission to the OTD program

This course is focused on evaluation and interventions appropriate for inpatient and community mental health settings for clients of all ages with mental health diagnoses and conditions. Theories and models of practice appropriate to the diagnosis, practice settings, and age groups guide the selection and use of specific assessment tools and evidence-based intervention methods, as well as social or community support needed to meet client occupational needs. These approaches include trauma-informed care, cognitive behavioral therapy (CBT), motivational interviewing techniques, sensory activities, Wellness Recovery Action Plans, traditional occupation approaches, harm reduction techniques, mindfulness, and diagnosis focused assessment measures. These approaches are advocated as appropriate to meet client occupational needs and reduce stigma and social/institutional barriers to performance and participation. The course also stresses the effects of medication on occupational performance, and ethical practice related to intervention planning, implementation, documentation, and discharge appropriate to the setting and client needs. Content relevant to legislative, legal, political, economic, and management/billing/documentation considerations for these service delivery areas is also covered.

formerly OTD 524

Cannot receive credit if taken former OTD 524 4 credit Adult & Aging 3

### **OTD 518 - Level IA Fieldwork Experience (1 cr.)**

Prerequisite: Admission to the OTD program

Students experience occupational therapy practice in settings that provide mental/behavioral health services (e.g. inpatient/outpatient psychiatric units; community-based behavioral health), and/or in settings that espouse mental health practices at their foundation (e.g. alternative educational facilities; memory units). Opportunities to observe and interact with clients who utilize these services are provided. Through this experience, students will understand that mental health is at the core of the occupational therapy profession and is relevant across all populations.

This course is graded pass/fail.

formerly Level IA Fieldwork

### **OTD 519 - Clinical Neuroscience (3 crs.)**

Prerequisite: OTD 505

This course will provide a comprehensive study of the neural systems that underlie human perception, emotion, memory, and attention; and of the pathological disorders that result from damage to these systems.

Following a review of neural cell physiology and neuroanatomy, the course will focus on the manner in which basic cognitive behavioral processes are disrupted due to neurodevelopmental, or neurodegenerative disorders, or subsequent to brain injury. Current



diagnostic methods will be examined, including an examination of how to interpret research/clinical findings and detect inherent limitations.

The course will culminate with the preparation and presentation of a neurobehavioral case study. Through this assignment, the students will learn to read and comprehend articles from a variety of scientific journals and integrate literary sources from physiological and behavioral approaches centered on a common clinical topic.

### **OTD 520 - Therapeutic Use of Self and Group Interventions (3 crs.)**

Prerequisite: Fall 1 - OTD 500, OTD 505, OTD 510, OTD 511, OTD 512, OTD 514, OTD 518

This course focuses on group and individual treatment methodologies in mental health and cognitive settings. Using the OTPF-3 as a guide, students will learn a variety of psychosocial treatment methods, including those addressing the areas of social skills, relaxation, cognition, sensory processing, and other areas. Group dynamics/group development is also emphasized, including group stages, leadership roles, conflict resolution, and problem solving. Therapeutic use of self is woven throughout the course as a therapeutic tool in occupational therapy. The nature of the material discussed in class may bring up personal feelings and experiences. For this reason, confidentiality is essential and each class member is expected to show respect for the ideas and beliefs of others.

### **OTD 522 - Adult & Aging Practice 2 (4 crs.)**

Prerequisite: OTD 514

This course focuses on evaluation and intervention appropriate for inpatient and outpatient rehabilitation settings for patients/clients with motor and orthopedic diagnoses and conditions. Theories and models of practice appropriate to the diagnosis and practice setting guides the selection and use of specific assessment tools and evidence-based intervention methods including modalities, orthotics, and prosthetics. The course also stresses ethical practice and the use of precautions with this population, in these settings, as well as intervention planning, implementation, documentation, and discharge appropriate to the setting and client occupational needs. Content relevant to legislative, legal, political, economic, and management/billing considerations for these service delivery areas is also covered.

### **OTD 523 - Assessment: Theory and Measures (2 crs.)**

Prerequisite: OTD 500, OTD 512, and OTD 517

In this course, students will be introduced to general concepts related to the theory and development of assessment tools/measures used for occupational therapy evaluation. Students will learn about various types of assessment tools and methods (standardized, non-standardized, interview, observation, survey/questionnaire, etc.), as well as the psychometric properties of and methodological research for assessment tools. Principles of administration and scoring will be covered, as well as challenges in the use of specific measures, including cultural bias.

Cannot receive credit if taken former OTD 511 Evaluation: Theory and Assessment Measures (2 cr.)

### **OTD 524 - Adult & Aging Practice 3 (4 crs.)**

Prerequisite: OTD 514

This course is focused on training students about evaluation and evidence-based interventions, appropriate for patients/clients of different cultures, throughout the lifespan, who have mental health diagnoses and conditions. Students learn to apply theories and models of practice, as well as social or community supports, to meet client occupational needs and reduce social and institutional barriers to performance and participation. They learn to apply these theories and models of practices to ethical practice related to intervention planning, implementation, documentation, and discharge appropriate to hospital and community mental health settings. Concepts that underlie much of the material of the course include the pervasive impact of trauma, a client-centered and individualized definition of recovery, and the inter-related impact of cognition and emotions on occupational performance. The course includes role-playing activities to enhance communication skills and exposure to the use of technology in evaluation and treatment. The course also covers the positive and negative effects of medication on cognition and occupational performance. Content relevant to legislative, legal, political, economic, and management/billing considerations for these service delivery areas is also covered.

### **OTD 525 - Research/Evidence-Based Practice 1 (3 crs.)**

Prerequisite: OTD 500, OTD 512, and OTD 517

This course is the first of two courses on research process and evidence-based practice (EBP). The course will explore the principles of human subject research, the necessity for research in knowledge development, and breadth of research methodologies. Students will learn to transform clinical problems, departmental issues, legislative concerns or advocacy opportunities into researchable questions. The course has three principal foci: 1) assessing/establishing evidence bases for practice with literature searches, systematic reviews, and meta analyses; 2) understanding the research process for qualitative and quantitative research, retrospective reviews, and single case designs, from defining the research question, performing literature reviews, selecting methodologies, measurements, and samples, to analyzing and writing up research; and 3) securing funding and human subjects' authorization for research.

### **OTD 526 - Population Health & Interprofessional Practice 1 (2 crs.)**

Prerequisite: Fall 1 - OTD 500, OTD 505, OTD 510, OTD 511, OTD 512, OTD 514, OTD 518

This course introduces the basic concepts of population health and focuses on physical and mental health issues in the adult and aging population as the basis for fostering a transformation within the health care continuum, i.e. acute care practice in hospitals; post-acute care in inpatient and outpatient rehabilitation centers, and skilled nursing facilities; primary care in community-based settings; and home health. Content correlates with OTD 514, 522, and 524. Populations studied include Veterans with PTSD; workers with acquired injuries; individuals with substance abuse, clients with memory impairment including concussion, and rural communities and populations with access to care challenges, etc. Students review the literature on interprofessionalism, develop tools for guiding the formation of interprofessional teams, identify questions to initiate needs assessments, design program initiatives, and recommend methods for achieving optimum interprofessional practice outcomes within existing settings.

**OTD 527 - Occupational Performance: Acute & Chronic Care OT (4 crs.)**

Prerequisite: OTD 500, OTD 504, OTD 509, OTD 512, OTD 517, and OTD 518

This course is focused on evaluation and intervention in medical, acute, and rehabilitation, settings for clients with medical and neurological diagnoses and conditions. Theories and models of practice appropriate to diagnosis and practice setting guides the selection and use of evidence-based assessment tools, intervention methods, and assistive technology. The course also stresses ethical practice and the use of precautions with this population/in these settings, as well as intervention planning, implementation, documentation, and discharge appropriate to setting and client's occupational needs. Content relevant to legislative, legal, political, economic, and management/billing/documentation considerations for these service delivery areas is also covered.

formerly OTD 514

Cannot receive credit if taken former OTD 514 4 credit Adult & Aging 1

**OTD 528 - Level IB Fieldwork (1 cr.)**

Prerequisite: OTD 518

Level I fieldwork is an integral part of the curriculum design woven in with the didactic components of the program. Level I fieldwork provides students with the opportunity to work with individuals across the lifespan in a variety of settings. OTD 528 will include clinical observations of adults and adolescents in, but not limited to, alternative high school, dementia care facilities, independent and assisted living facilities, and acute mental health, specifically focusing on the psychosocial components of their care. During faculty-led, on- and off-site fieldwork experiences, students will complete learning activities in order to assess their understanding and comprehension of the OTD didactic coursework. Activities and assignments will coincide with OTD 520, OTD 522, and OTD 524.

This course is graded pass/fail.

**OTD 530 - Children & Youth Practice 1 (4 crs.)**

Prerequisite: OTD 522 and OTD 524

The focus of this course is on occupational therapy evaluation and intervention for children from newborn to age five years. Developmental and ecocultural theories and models of sensory processing, neurodevelopment, and learning are examined as appropriate to child and caregiver needs and practice settings. Students will explore the occupations of children and caregivers, as influenced by health and wellness, illness, disability, context, and environment, in medical, early intervention, preschool, and home settings. Students will learn how theory guides the selection and safe use of assessment tools, intervention methodologies, assistive technology, and the choice of social or community supports. This course also addresses legislation and ethics in pediatric practice.

**OTD 531 - Clinical Applications of Neuroscience (4 crs.)**

Prerequisite: OTD 500, OTD 509, and OTD 517

This course covers the anatomy and physiology of the adult nervous system as a foundation for the evaluation, interpretation, and treatment of clients with disorders of the nervous system. Following a review of neural cell physiology and neuroanatomy, the course will focus on the manner in which basic cognitive behavioral processes are disrupted due to neurodevelopmental, or neurodegenerative

disorders, or subsequent to brain injury. The students will learn to read and comprehend articles from a variety of scientific journals and integrate literary sources from physiological and behavioral approaches centered on a common clinical topic.

Cannot receive credit if taken former OTD 519 3 credits Clinical Neuroscience

Also cannot receive credit if taken former OTD 505 3 credit Neuroanatomy & Neurophysiology

**OTD 534 - Research Process/Evidence-Based Practice 1 (2 crs.)**

Prerequisite: Spring 1 - OTD 519, OTD 520, OTD 522, OTD 524, OTD 526, & OTD 528

This course is the first of two courses on the research process and evidence based practice (EBP). The two courses will explore the principles of human subject research, the necessity for research in knowledge development, and breadth of research methodologies. In this first course of the series, students will learn to transform clinical problems, departmental issues, legislative concerns or advocacy opportunities, and population needs into researchable questions. The course has three principal foci: 1) assessing/establishing evidence bases for practice using databases, systematic literature reviews, meta analyses, and validity/reliability assessment of research, 2) understanding the research process, from defining the research question; performing literature reviews; selecting methodologies, measurements, and samples; to analyzing and writing up research; and 3) securing funding and human subjects authorization for research.

**OTD 536 - Population Health & Interprofessional Practice 2 (2 crs.)**

Prerequisite: OTD 526

This course focuses on the area of population health as it relates to developmental, physical, and psychosocial issues for the population of infants, young children, and their caregivers as the basis for fostering a transformation within the health care continuum. Settings include acute, post-acute care and rehabilitation in hospitals and inpatient and outpatient rehabilitation centers, early intervention programs, pre-school settings and transitions and communication across the settings. Populations studied include children with congenital and chronic disabilities, acute care condition; terminal diagnoses, and other medically-based conditions. Students review the literature on interprofessionalism, develop tools for guiding the formation of interprofessional teams, identify measures to conduct needs assessments, consider program initiatives, and recommend methods for achieving optimum interprofessional outcomes within existing settings.

**OTD 537 - Occupational Performance: Post-Acute and Outpatient OT (4 crs.)**

Prerequisite: OTD 500, OTD 504, OTD 509, OTD 512, OTD 517, and OTD 518

This course is focused on evaluation and intervention appropriate for inpatient and outpatient rehabilitation settings for clients with motor and orthopedic conditions and diagnosis. This course will be guided by current evidence-based practice, theories, and therapeutic models commonly used in these practice settings. Common orthopedic conditions and diagnoses will be discussed along with proper evaluation techniques, interventions, and discharge planning. Lab sections will include hands-on competence training including diagnosis specific patient handling, elastic therapeutic taping, safe

modality use, orthotic fabrication, and assistive technology evaluation. This course also stresses ethical and safe practice and the use of precautions specific to this population. Content relevant to legislative, legal, political, economic, and management/billing/documentation considerations for these service delivery areas is also covered.

formerly OTD 522

Cannot receive credit if taken former OTD 522 4 credit Adult & Aging 2

### **OTD 538 - Level IC Fieldwork (1 cr.)**

Prerequisite: OTD 528

Level I fieldwork is an integral part of the curriculum design woven in with the didactic components of the program. Level I fieldwork provides students with the opportunity to work with individuals across the lifespan in a variety of settings. OTD 538 will include clinical observations of children, with a focus on birth to 5, in but not limited to, child care facilities, play groups, and early intervention. During faculty-led, on- and off-site fieldwork experiences, students will complete learning activities in order to assess their understanding and comprehension of the OTD didactic coursework. Activities and assignments will coincide with OTD 530.

This course is graded pass/fail.

### **OTD 539 - Level IB Fieldwork Experience (1 cr.)**

Prerequisite: OTD 500, OTD 504, OTD 509, OTD 512, OTD 518, OTD 506, and OTD 517

Corequisite: OTD 527 and OTD 537

Students experience occupational therapy practice in acute care hospitals/medical centers, inpatient/outpatient rehabilitation centers, and/or post-acute facilities. Opportunities to observe acute care and outpatient practice and interact with standardized patients and/or real clients experiencing medically complex conditions, neuro-motor diagnoses, or orthopedic conditions are provided.

Cannot receive credit if taken former OTD 528 1 credit Level IB Fieldwork

This course is graded pass/fail.

### **OTD 541 - Doctoral Experiential 1: Needs Assessment & Program Development (2 crs.)**

Prerequisite: Year 1 Spring Semester courses

This is the first course in the Doctoral Experiential sequence and focuses on the sequence of actions necessary to conduct a comprehensive needs assessment in order to develop an evidence-based program to address the identified needs. Students will examine theoretical models of community-based practice and health promotion; investigate a community to develop a profile; identify a program, interview program managers and conduct a critical analysis of program strengths, weaknesses, opportunities, and threats; research and identify available grant funding options for program

development; and learn strategies for grant writing. Students will work simultaneously with their assigned faculty mentor and the Doctoral Capstone Coordinator to identify and procure a facility/site at which they will ultimately complete the Doctoral Experiential Capstone Component of the OTD program. Students will identify a site mentor, who will work with the student throughout the Doctoral Experiential process. Students will conduct a needs assessment, analyze the information, and disseminate the results through a scholarly report. This course supports the OTD 544: Doctoral Experiential 1: Mentorship Seminar.

Cannot receive credit if taken former 1 credit OTD 632 Doctoral Residency 1: Needs Assessment or 2 credit OTD 630 Leadership: Needs Assessment and Program Development

This course is graded pass/fail.

### **OTD 544 - Doctoral Experiential 1: Mentorship Seminar (1 cr.)**

Prerequisite: Year 1 Spring Semester courses

Corequisite: OTD 541

This course is taken in conjunction with OTD 541: Doctoral Experiential 1: Needs Assessment & Program Development and provides the student with faculty mentorship for initiating a needs assessment relevant to a particular topic. The course addresses the following: review of the literature; development of a community profile; identification of possible sites; identification of measurement tools to conduct a needs assessment; analysis of the data collected; and writing and disseminating a scholarly report on the results of the preliminary needs assessment. Students will be assigned a faculty mentor who will work with them throughout the Doctoral Experiential sequence of courses.

Cannot receive credit if taken former OTD 633 1 credit Doctoral Residency 1: Mentorship

This course is graded pass/fail.

### **OTD 545 - Population Health & Interprofessional Practice: Children & Youth (2 crs.)**

Prerequisite: OTD 523, OTD 525, OTD 527, and OTD 537

Corequisite: OTD 547

This course is designed to introduce the basic concepts of population health as utilized by occupational therapists in fostering the goals of health promotion, cultural humility, improved client-centered care experiences/outcomes, and global health and wellness initiatives. This course will specifically target the developmental, physical, and psychosocial issues that limit health equity and wellness in infants, young children, school-age youth, and adolescent populations and their caregivers. Within this course there is an emphasis on understanding and implementing the life course health development model, focusing on infancy through adolescence. Patient/client groups discussed will include those with congenital and chronic disabilities, acute care medical conditions, intellectual disabilities, neuro-muscular disorders, and others. Students will also be introduced to the core principles of interprofessionalism and how working together in collaborative health care teams is essential to the achievement of these goals. This course is aligned with course content in OTD 547 that addresses occupational performance in the pediatric population across a variety of healthcare settings including acute medical, rehabilitation, early education, home-based care, and school-based and community practice. Students will review the literature on interprofessional practice and will identify best-practice strategies for: forming interprofessional teams in various practice contexts and with differing populations; communicating and

collaborating on goal setting; and managing shared responsibility to optimize outcomes.

Cannot receive credit if taken former OTD 526 2 credit Population Health & Interprofessional Practice 1  
or  
OTD 626 2 credit Population Health & Interprofessional Practice 2

### **OTD 547 - Occupational Performance: Infants & Young Children (4 crs.)**

Prerequisite: OTD 523, OTD 525, and OTD 531

This course is focused on evaluation and intervention appropriate for primary care medicine, acute care medicine (e.g., NICU), community practice (e.g., early intervention), and preschool for children, ages 0-5, with medical and educational diagnoses/conditions. Theories and models of practice appropriate to the diagnosis and practice setting guides the selection and safe use of evidence-based assessment tools, intervention methodology and assistive technology, and the choice of supports needed to facilitate client occupational needs and reduce social, community, and institutional barriers to performance and participation. The course also stresses childhood development, family and cultural influences, and ethical practice related to intervention planning/implementation, documentation of services, and discharge practices appropriate to the setting and the client's needs. Content relevant to legislative, legal, political, economic, and management/billing/documentation considerations for these service delivery areas is also covered.

Cannot receive credit if taken former OTD 530 4 credit Children & Youth 1

### **OTD 549 - Level 1C Fieldwork Experience (1 cr.)**

Prerequisite: OTD 523, OTD 525, OTD 527, OTD 531, OTD 537, and OTD 539

Corequisite: OTD 547

Students experience occupational therapy pediatric practice with infants and children ages birth to five (5). Opportunities to interact with children and adolescent clients experiencing cerebral palsy, muscular dystrophy, congenital limb disorders, PDD or other motor or neurological diagnoses are provided.

Cannot receive credit if taken former OTD 538 1 credit Level IC Fieldwork

This course is graded pass/fail.

### **OTD 614 - Children & Youth Practice 2 (4 crs.)**

Prerequisite: OTD 530

This course is focused on evaluation and intervention appropriate for community, school-based, and residential practice for children and youth with mental health diagnoses and substance abuse conditions, learning and emotional disabilities, and developmental disabilities. Theories and models of practice appropriate to the diagnosis and practice setting guides the selection and use of specific assessment tools, evidence-based intervention methods, assistive technology, and social, educational, or community supports needed to facilitate client transitions and reduce social and institutional barriers to performance and participation. The course also stresses ethical practice related to intervention planning/implementation, documentation of services, and discharge practices appropriate to the setting and the client's needs. Content relevant to legislative, legal, political, economic, and management/billing considerations for these service delivery areas is also covered.

### **OTD 624 - Research Process/Evidence-Based Practice 2 (2 crs.)**

Prerequisite: OTD 534

This course is the second of the two courses on research process and evidence based practice (EBP). The two courses will explore the principles of human subject research, the necessity for research in knowledge development, and breadth of research methodologies. In this second course of the series, students will move beyond being knowledgeable consumers of research to becoming interprofessional team members who 1) participate in the design of qualitative and quantitative research methodologies, 2) understand the selection of data analysis tools for qualitative and quantitative research, 3) develop skills in writing about research methodology for both proposals and research papers, 4) become adept at displaying findings from research, and 5) demonstrate the ability to summarize and interpret research findings.

Offered: in spring

### **OTD 626 - Population Health & Interprofessional Practice 3 (2 crs.)**

Prerequisite: OTD 536

This course focuses on the area of population health as it relates to the developmental, physical, and psychosocial issues of school-age youth and adolescent populations and their caregivers as the basis for fostering a transformation within the health care continuum. Settings include post-acute care in inpatient and outpatient rehabilitation centers, school and community settings, community-based/residential settings, and home health as well as transition and communication across the settings. Populations studied include children with disabilities, congenital and chronic disabilities; acute care conditions; terminal diagnoses and learning and other medically-based conditions. Students review the literature on interprofessionalism, develop tools for guiding the formation of interprofessional teams, identify measures to conduct needs assessments, consider life-long population needs and program initiatives, and recommend methods for achieving optimum interprofessional outcomes within existing settings.

### **OTD 627 - Transformational Management (2 crs.)**

Prerequisite: OTD 545 and OTD 547

Corequisite: OTD 628

This class is designed for students to focus on administration, organization, and management issues in traditional and role-emerging practice settings. Topics addressed include organizational leadership and management in healthcare, marketing, reimbursement, budgeting, advocacy, legislation, and human resource issues. In addition, emphasis is placed on the internal and external forces impacting the systems in which occupational therapists work (healthcare, educational, community, sociocultural, etc.) facilitating the development of collaborative interprofessional skills.

Cannot receive credit if taken former OTD 648 2 credit Management in Changing Healthcare Contexts

### **OTD 628 - Leadership Development & Entrepreneurship (2 crs.)**

Prerequisite: OTD 545 and OTD 547

Corequisite: OTD 627

This course focuses on the range of leadership and governance skills that are necessary for the delivery of occupational therapy services in existing health care environments and for the emerging practice settings of the future. A historical perspective on how occupational therapy's leaders impacted practice settings and populations served, provides a foundation for understanding a leader's role in today's hospital unit or mental health agency, or tomorrow's prison system and social services agency for the homeless. Because occupational therapy is an international profession with fieldwork placements and employment opportunities around the world, it is also important to be exposed to global leadership and advocacy opportunities. Guided by these perspectives, students will creatively predict what emergent leadership skills will be necessary as they explore the impact of new medical conditions/diseases, the needs of displaced persons and marginalized communities, the development of entrepreneurial practice areas, e.g. disaster management or human trafficking, and the implications of modified working conditions (telehealth and higher education).

Cannot receive credit if taken former OTD 660 2 credit Leadership in a Global Health Marketplace OR OTD 661 2 credit Advanced Seminar: Future Trends in Practice

### **OTD 630 - Leadership: Needs Assessment and Program Development (2 crs.)**

Prerequisite: Summer 1 OTD 530, OTD 534, OTD 536, & OTD 538

This course focuses on the sequence of actions necessary to conduct a needs assessment and develop an evidence-based program to address the identified needs. Students will examine theoretical models of community based practice and health promotion; conduct a critical analysis of program strengths, weaknesses, opportunities, and threats; research and identify available grant funding options for program development; and learn strategies for grant writing.

This course supports OTD 632 Doctoral Experiential 1: Needs Assessment.

### **OTD 631 - Doctoral Experiential 2: Proposal Development (3 crs.)**

Prerequisite: OTD 541 and OTD 544

This is the second course in the Doctoral Experiential sequence. During this course, students will report the findings of the needs assessment to the facility/site representative and work with the faculty and site mentors to identify a researchable question, complete a literature review; and author the first two components of a scholarly report. This course emphasizes completion of the Introduction, Problem Statement, Project Rationale, and Literature Review sections. This course is taken concurrently with OTD 634: Doctoral Experiential 2: Mentorship Seminar.

Course is graded pass/fail

Cannot receive credit if taken former OTD 642 1 credit Doctoral Experiential 2: Proposal Development

### **OTD 632 - Doctoral Experiential 1: Needs Assessment (1 cr.)**

Prerequisite: Summer 1 OTD 530, OTD 534, OTD 536, & OTD 538

This is the first course in the Doctoral Experiential sequence. During this course, students will work with their assigned faculty mentor to identify potential populations and possible facilities/sites at which he/she may complete the Doctoral Experiential Component of the program. Using the skills/knowledge regarding needs assessment from OTD 630 Leadership: Needs Assessment and Program Development and faculty guidance from OTD 633: Mentorship (both taken concurrently with this course), students will identify objectives of a needs assessment, develop various needs assessment instruments, and analyze methodology of data collection.

Formerly "Doctoral Residency 1: Needs Assessment"

This course is graded pass/fail.

### **OTD 633 - Doctoral Experiential 1: Mentorship (1 cr.)**

Prerequisite: Summer 1 OTD 530, OTD 534, OTD 536, & OTD 538

This course is taken in conjunction with OTD 632 and provides the student with faculty mentorship for exploration of possible Doctoral Experiential opportunities including: facility and site identification; structure and guidance in formulating needs assessment tools in various settings; literature reviews and evidence based practice; and student and mentor roles and responsibilities. Students will be assigned a faculty mentor who will work with them throughout the Doctoral Experiential sequence.

Formerly "Doctoral Residency 1: Mentorship"

This course is graded pass/fail.

### **OTD 634 - Doctoral Experiential 2: Mentorship Seminar (2 crs.)**

Prerequisite: OTD 541 and OTD 544

Corequisite: OTD 631

This course is taken in conjunction with OTD 631: Doctoral Experiential 2: Proposal Development and provides the student with faculty mentorship for completion of and presentation of the needs assessment findings, development of a doctoral project focus and a proposal plan for implementation; identification of a researchable question; and completion of the Introduction, Problem Statement, Rationale, and Literature Review sections of the doctoral project. Students identify a facility and cultivate a relationship with potential mentor(s) at the identified site, with support and faculty mentorship.

Cannot received credit if taken former OTD 643 1 credit Doctoral Experiential 2: Mentorship

### **OTD 635 - Research/Evidence-Based Practice 2 (3 crs.)**

Prerequisite: OTD 541, OTD 544, OTD 545, and OTD 547

This course is the second of two courses on research process and evidence-based practice (EBP). In this course, students will move beyond being knowledgeable consumers of research to becoming interprofessional team members who 1) participate in the design of qualitative and quantitative research methodologies, 2) understand the selection of data analysis tools for qualitative and quantitative research, 3) develop skills in writing about research methodology for both proposals and research papers, 4) become adept at displaying findings from research, and demonstrate the ability to summarize and interpret findings. Students will learn this content through the completion of a scholarly study that informs the scholarship component of the Doctoral Experiential Capstone Project (DEx). This knowledge will be ascertained through the completion of a scholarly

study that informs the scholarship component of the Doctoral Experiential Capstone Project (DEX).

Cannot receive credit if taken former OTD 624 2 credit  
Research Process/Evidence-Based Practice 2

### **OTD 637 - Occupational Performance: Childhood & Adolescence (4 crs.)**

Prerequisite: OTD 545, OTD 547, and OTD 549

This course is focused on evaluation and intervention appropriate for school system, community, and residential practice for children and youth, ages 5-21, with mental health diagnoses and substance abuse conditions, learning and emotional disabilities, sensory integration issues, and developmental disabilities. Theories and models of practice appropriate to the diagnosis and practice setting guides the selection and use of specific assessment tools and evidence-based intervention methods and assistive technology, and the choice of social, educational, or community supports needed to facilitate client transitions and reduce barriers to performance and participation. The course also stresses ethical practice related to intervention planning/implementation, documentation of services, and discharge practices appropriate to the setting and the client's needs. Content relevant to legislative, legal, political, economic, and management/billing/documentation considerations for these service delivery areas is also covered.

Cannot receive credit if taken former OTD 614 4 credit Children & Youth Practice 2

### **OTD 638 - Level ID Fieldwork (1 cr.)**

Prerequisite: OTD 538

Level I fieldwork is an integral part of the curriculum design and integrated with the didactic components of the program. Level I fieldwork provides students with the opportunity to work with individuals across the lifespan in a variety of settings. OTD 638 will include clinical observations of children and adolescents, in but not limited to, the school setting. During off-site faculty guided clinical experiences, students will complete learning activities in order to assess their understanding and comprehension of the OTD didactic coursework. Activities and assignments will coincide with OTD 614.

This course is graded pass/fail.

### **OTD 639 - Level 1D Fieldwork Experience (1 cr.)**

Prerequisite: OTD 545, OTD 547, and OTD 549

Corequisite: OTD 637

Students experience occupational therapy practice in school based, community based, and/or residential settings. Opportunities to observe children, youth, and adolescent practice and interact with standardized and/or real clients experiencing developmental, learning, psychosocial, and other related conditions are provided.

Cannot receive credit if taken OTD 638 Level ID Fieldwork (1 cr.)

this course is graded pass/fail

### **OTD 640 - Adult & Aging Practice 4 (4 crs.)**

Prerequisite: OTD 524

This course is focused on evaluation and intervention for primary care medicine, community health and home settings, as well as long-term disability for adults and aging individuals to promote a healthy lifestyle and to support productive aging. Theories and models of practice appropriate to the diagnosis and practice setting guides the

selection and use of specific assessment tools, evidence-based interventions, assistive technology, and social or community supports. Sociocultural sensitivity, aimed at reducing social and institutional barriers to performance and participation is also addressed. This course also stresses ethical practice related to intervention planning/implementation, documentation of services, and discharge practices appropriate to the setting and the client's needs. Content relevant to legislative, legal, political, economic, and management/billing considerations for these service delivery areas is also covered.

### **OTD 642 - Doctoral Experiential 2: Proposal Development (1 cr.)**

Prerequisite: OTD 632

This course is designed to foster skills for developing proposals in multiple settings and for multiple purposes. Students will learn to perform many tasks that are required in leadership positions: writing grant proposals, business plans, and requests to administration for process, equipment, or staffing changes. They will learn how to create graphics, gain practice in adapting language and style to target audiences, and how to develop and justify budgets (of time and costs), and project return on investment. Proposals are often team efforts, so students will also learn to be a consultant and to give and receive constructive feedback. The proposals that will be created in this course are similar to those that will be created this semester for the Doctoral Experiential projects.

Formerly "Doctoral Residency 2: Proposal Development"

This course is graded pass/fail.

### **OTD 643 - Doctoral Experiential 2: Mentorship (1 cr.)**

Prerequisite: OTD 633

This course is taken in conjunction with OTD 642 Doctoral Experiential 2: Proposal Development. During this course, students will work with their faculty mentor, identify and begin collaboration with a site mentor, and prepare a proposal for their individual Doctoral Experiential, including both the experiential and scholarly components. The proposal will include development of a doctoral project focus and a plan for completion.

Formerly "Doctoral Residency 2: Mentorship"

This course is graded pass/fail.

### **OTD 645 - Population Health and Interprofessional Practice: Adult & Aging (2 crs.)**

Prerequisite: OTD 545, OTD 627, and OTD 628

Corequisite: OTD 657

This course is designed to explore the population health ecosystem, including program initiatives to improve health promotion, cultural humility, access and outcomes, global health and wellness initiatives, and the education and advocacy tools needed to inform, engage with, and empower adult and aging populations. Students will explore how life-changing acute and chronic physical and mental health conditions in adults are negatively impacted by the culture of existing medical practices, and how client-centered care and a culture of wellness can maximize health and performance. Within this course there is an emphasis on understanding and implementing the life course health development model, focusing on adulthood through end of life. Some of the populations studied include Veterans with PTSD, workers with acquired injuries, individuals with alcohol and substance abuse

problems, clients with memory impairment including concussion, at-risk groups with access to care challenges, and the well-elderly. Students will utilize the core principles of interprofessionalism to envision collaborative practice teams who work together as a catalyst for transformative change in diverse practice settings. Utilizing content knowledge gained in OTD 517, OTD 527, OTD 537, and OTD 657, students will explore team membership, communication strategies, and techniques for shared decision-making in settings such as: primary care; post-acute in-patient care; outpatient rehabilitation centers; community-based mental health settings; and agencies providing home health.

Cannot receive credit if taken OTD 646 Population Health and Interprofessional Practice 4 (2 crs.)

or

if taken former OTD 526 2 credit Population Health & Interprofessional Practice 1

### **OTD 646 - Population Health and Interprofessional Practice 4 (2 crs.)**

Prerequisite: OTD 626

This course focuses on the area of population health as it relates to primary care and community based practice with the adult and aging population as the basis for fostering a transformation within community based/residential settings and home health, as well as transition and communication across the settings. Various populations and conditions for adults through the life cycle, including well elderly and those with chronic disease, are studied within this course with a focus on the advancement of interprofessionalism as a catalyst for change in these settings. Settings include post-acute care in inpatient and outpatient rehabilitation centers, work and community settings, and community-based/residential settings. Students review the literature on interprofessionalism, develop tools for guiding the formation of interprofessional teams, consider life-long population needs, program initiatives, and develop education and advocacy tools to inform, engage and empower populations across the lifespan.

### **OTD 647 - Preparation for Professional Practice (2 crs.)**

Prerequisite: Fall 2 - OTD 614, OTD 624, OTD 626, OTD 630, OTD 632, OTD 633, and OTD 638

This course focuses on facilitating the transition from academic student, to fieldwork student, and ultimately to future practitioner. Topics addressed include clinical supervision, communication, ethics, certification and licensure, employment, professional organizations and affiliations, professional behaviors at fieldwork and beyond, the student's role as a future fieldwork educator, interviewing skills, negotiation, and lifelong learning. In addition, students will complete an electronic portfolio highlighting their progress throughout the didactic portion of their education and in preparation for fieldwork and employment.

### **OTD 648 - Management in Changing Healthcare Contexts (2 crs.)**

Prerequisite: Fall 2 - OTD 614, OTD 624, OTD 626, OTD 630, OTD 632, OTD 633, and OTD 638

This class is designed for students to focus on administration, organization, and management issues in traditional and role emergent practice settings. Topics addressed include organizational management in healthcare, marketing, reimbursement, budgeting, advocacy, legislation, and human resource issues. In addition, emphasis is placed on the internal and external forces impacting the systems in which occupational therapists work (healthcare, educational, community, sociocultural, etc.) facilitating the development of collaborative interprofessional skills.

Offered: in fall

### **OTD 649 - Level 1E Fieldwork Experience (1 cr.)**

Prerequisite: OTD 637 and OTD 639

Corequisite: OTD 657

Students experience occupational therapy practice in community-based settings. Opportunities to observe and interact with standardized and/or real clients through the lifespan are provided. Students will be given opportunities to provide education/training/consultation to clients, within the contexts of the setting.

Course is graded pass/fail

Cannot receive credit if taken former OTD 658 1 credit Level IE Fieldwork

### **OTD 651 - Doctoral Experiential 3: Pre-Implementation Planning (3 crs.)**

Prerequisite: OTD 631, OTD 634, and OTD 635

Corequisite: OTD 654

This is the third course in the Doctoral Experiential sequence. During this course, students will identify the methodology of the project and collaborate with the site and faculty mentors to establish a plan for implementation. For this component, students will write the Methodology, Population, and Data Collection and Analysis sections of the scholarly report for the proposed program/project. This course is taken concurrently with OTD 654: Doctoral Experiential 3: Mentorship Seminar.

Cannot receive credit if taken former OTD 662 3 credit Doctoral Experiential 3: Research & Planning

Course is graded pass/fail

### **OTD 652 - Comprehensive Exam Preparation (1 cr.)**

Prerequisite: Year 2 Fall courses - OTD 627, OTD 628, OTD 631, OTD 634, OTD 635, OTD 637, OTD 639

This course supports the further development of clinical reasoning, problem-based thinking/learning, and test taking strategies through case studies, simulated experiences, and clinical practice examinations. Students will be guided in organizing and reviewing curriculum content; applying clinical knowledge; and preparing for the National Board for Certification in Occupational Therapy (NBCOT) exam. This course includes opportunities for practice questions and examinations, with discussions surrounding test taking strategies, rationale for specific answers, and time management techniques specific to test taking. By the end of the course, students must pass the Occupational Therapy Knowledge Exam (OTKE) administered through NBCOT. This exam reflects comprehensive, generalist knowledge and can help to prepare students for the

NBCOT exam. This course is graded pass/fail. Students must pass this course in order to progress to the Doctoral phase of the program.

Cannot receive credit if taken former OTD 659 1 credit Comprehensive Exam

### **OTD 653 - Professionalism in OT Practice (2 crs.)**

Prerequisite: Year 2 Fall courses - OTD 627, OTD 628, OTD 631, OTD 634, OTD 635, OTD 637, OTD 639

This course focuses on facilitating the evolution from classroom learner, to fieldwork student, and ultimately to future practitioner. Topics addressed include clinical supervision, feedback dynamics, communication, ethics, certification and licensure, workforce entry skills, professional organizations and affiliations, professional behaviors, the student's role as a future fieldwork educator, interviewing skills, emotional intelligence, customer service in healthcare and lifelong learning. The overall learning objective at the completion of this course is that the student will possess the skills necessary to succeed both in fieldwork and employment.

Cannot receive credit if taken former OTD 647 2 credit Preparation for Professional Practice

### **OTD 654 - Doctoral Experiential 3: Mentorship Seminar (3 crs.)**

Prerequisite: OTD 631, OTD 634, and OTD 635

This course is taken in conjunction with OTD 651: Doctoral Experiential 3: Pre-Implementation Planning and provides the student with faculty mentorship for completing the Methodology, Population, and Data Collection/Data Analysis sections of the scholarly report.

Cannot receive credit if taken former OTD 663 2 credit Doctoral Experiential 3: Mentorship

This course is graded pass/fail.

### **OTD 657 - Occupational Performance: Community-Based OT (4 crs.)**

Prerequisite: OTD 637 and OTD 639

This course is focused on evaluation and intervention appropriate for primary care medicine, community health and home settings, transition planning and long-term disability for individuals to promote healthy living. Theories and models of practice appropriate to the diagnosis and practice setting guides the selection and use of specific assessment tools, evidence-based intervention methods and assistive technology, and the choice of social or community supports that embrace sociocultural sensitivity aimed at reducing social and institutional barriers to performance and participation. The course also stresses ethical practice related to intervention planning/implementation, documentation of services, and discharge practices appropriate to the setting and the client's needs. Content relevant to legislative, legal, political, economic, and management/billing/documentation considerations for these service delivery areas is also covered.

Cannot receive credit if taken former OTD 640 4 credit Adult & Aging Practice 4

### **OTD 658 - Level IE Fieldwork (1 cr.)**

Prerequisite: OTD 638

Students experience occupational therapy practice in adult/aging, well-elderly/community-based, and/or residential settings. Opportunities to observe aging adults within their primary residential

settings and interact with standardized and/or real clients experiencing chronic disabilities, pain, age-related conditions, etc. are provided. Students will be given opportunities to provide recommendations to promote successful aging in place, including fall prevention strategies, home/environmental modifications, community access/mobility strategies, home management, and others relevant to the client(s)/setting(s). Students are expected to model interprofessionalism, as permitted by the site (e.g. in-service presentation; form an IPP team to work with a client; develop a proposal for an IPP team on a unit; create a survey to establish perceptions of IPP; run a focus group to identify barriers to IPP).

This course is graded pass/fail.

### **OTD 659 - Comprehensive Exam (1 cr.)**

Prerequisite: Fall 2 - OTD 614, OTD 624, OTD 626, OTD 630, OTD 632, OTD 633, and OTD 638

This course supports the further development of clinical reasoning, problem-based thinking/learning, and test taking strategies through case studies, simulated experiences, and clinical practice examinations. Students will be guided in organizing and reviewing curriculum content; applying clinical knowledge; and preparing for the National Board for Certification in Occupational Therapy (NBCOT) exam. This course includes opportunities for test-taking strategies, rational for specific answers, and time management techniques specific to test taking.

This course is graded pass/fail. Students must pass this course to progress to the Level II Fieldwork and Doctoral Experiential phases of the program.

### **OTD 660 - Leadership in a Global Health Marketplace (2 crs.)**

Prerequisite: Spring 2 - OTD 640, OTD 642, OTD 643, OTD 646, OTD 647, OTD 648, OTD 658, OTD 659

This course focuses on leadership and management skills for the delivery of occupational therapy services in a global marketplace. Students are introduced to a range of current and ongoing international health issues and developments in global health. This includes new and emerging conditions/diseases and their impact on health/wellness and participation in occupation/life roles (i.e. leisure and social participation, parenting, etc.). The goal of this course is to enable students to understand the leadership role occupational therapists can take as part of an interprofessional team in the changing local, national, and global health care environment. As a class, students will implement a service project to support an agency/organization providing global health care services.

### **OTD 661 - Advanced Seminar: Future Trends in Practice (2 crs.)**

Prerequisite: Spring 2 - OTD 640, OTD 642, OTD 643, OTD 646, OTD 647, OTD 648, OTD 658, OTD 659

This course focuses on preparing for leadership and management skills for the delivery of occupational therapy at local, state, national, and global levels as part of a collaborative interprofessional health care team. A central focus of this course will be on emerging and innovative practice areas. Students will review the history of the profession and the environments where occupational therapists provide care as well as social, economic, political, geographic, and demographic issues. Emphasis will be on the influence that



occupational therapy has had on populations and settings over time, as well as the influence that the contexts of practice have on the profession. Students will envision and prepare for the future of health care, education, and community services, and the leadership roles and influence that is possible for occupational therapists.

### **OTD 662 - Doctoral Experiential 3: Research and Planning (3 crs.)**

Prerequisite: OTD 642

This course is designed to enhance skills for program development for research and educational projects. It is focused on preparation for the scholarship part of the doctoral experiential. Students will learn to perform many tasks that are required in managing large projects in general terms and for the students' projects in particular: project time management, application of theoretical frameworks, instrument development, application of appropriate technologies/media for education, development of appropriate IRB/consent documentation, and creation of meaningful project evaluation/outcome measures. Students will develop essential graphics for their proposals and later reports. They will gain practice in adapting their language, style, and media to target the audience for whom they are creating materials. They will further develop and justify budgets (of time and costs) for their project. Most of the experiential projects are team efforts; students will work with their experiential group on projects for this course. Labs will involve both time to work on the week's projects with assistance of faculty, practice using new technologies when relevant, and sharing of ideas/problem solving with the rest of the class.

Formerly "Doctoral Residency 3: Research and Planning"

This course is graded pass/fail.

### **OTD 663 - Doctoral Experiential 3: Mentorship (2 crs.)**

Prerequisite: OTD 643

This course is taken in conjunction with OTD 662: Doctoral Experiential 3: Research and Planning. Following up on the work accomplished in OTD 643, this course provides the student with faculty mentorship for further developing the proposal and plan for the Doctoral Experiential. During this course, students will work with their faculty and site mentors to specify dates, deadlines, and activities for the planned community experience. They will also conduct a preliminary scholarly project, such as a pilot of data collection and analysis, a needs assessment, or a scholarly literature based project such as a systematic review.

Formerly "Doctoral Residency 3: Mentorship"

This course is graded pass/fail.

### **OTD 675 - Level II Fieldwork 1 (9 crs.)**

Prerequisite: Successful completion of all previous coursework

OTD 675 and 775 are two separate Level II fieldwork affiliation courses. Each fieldwork consists of a twelve-week, full time, supervised clinical internship experience in either a traditional or role-emerging practice setting. These supervised fieldwork experiences provide the student with an opportunity to apply concepts learned in didactic and prior clinical knowledge, as well as refine

evaluation and treatment skills by working with multiple populations across the lifespan in a variety of settings. Students are provided the opportunity to engage in professional and ethical practice, apply critical thinking, improve clinical reasoning, and refine therapeutic skills to achieve the benchmark of an entry-level competent occupational therapy practitioner. Students will complete the Student Evaluation of Fieldwork Experience and Fieldwork Educators will complete the AOTA Performance Evaluation at the conclusion of each clinical affiliation.

This course is graded pass/fail.

formerly Level II-1 Fieldwork

### **OTD 775 - Level II Fieldwork 2 (9 crs.)**

Prerequisite: Successful completion of all previous coursework

OTD 675 and 775 are two separate Level II fieldwork affiliation courses. Each fieldwork consists of a twelve-week, full time, supervised clinical internship experience in either a traditional or role-emerging practice setting. These supervised fieldwork experiences provide the student with an opportunity to apply concepts learned in didactic and prior clinical knowledge, as well as refine evaluation and treatment skills by working with multiple populations across the lifespan in a variety of settings. Students are provided the opportunity to engage in professional and ethical practice, apply critical thinking, improve clinical reasoning, and refine therapeutic skills to achieve the benchmark of an entry-level competent occupational therapy practitioner. Students will complete the Student Evaluation of Fieldwork Experience and Fieldwork Educators will complete the AOTA Performance Evaluation at the conclusion of each clinical affiliation.

This course is graded pass/fail.

formerly Level II Fieldwork

### **OTD 780 - Doctoral Experiential 4: Implementation/Capstone (10 crs.)**

Prerequisite: OTD 662

Corequisite: OTD 785

This is the fourth and final course in the Doctoral Experiential sequence. This course is taken concurrently with OTD 785, Doctoral Experiential 4: Mentorship. It is an advanced professional development opportunity that is realized through implementation of the 14-week/560-hour community experiential and scholarly project that students have designed with their faculty and site mentors. Working with their faculty and site mentors, the student will prepare a final reflective portfolio and a formal presentation for professional publication/dissemination

This course is graded pass/fail.

formerly Doctoral Residency 4: Implementation/Capstone

### **OTD 781 - Doctoral Experiential 4: Implementation/Capstone (10 crs.)**

Prerequisite: Successful completion of all previous coursework

This is the fourth and final course in the Doctoral Experiential sequence. It represents advanced professional skills. It is a 14-week/640-hour experience that focuses on the implementation of the evidence-based, community-based, interprofessional doctoral project/study on-site at the community agency/facility. During the course, students will complete any necessary updates or edits to the project proposal and complete the final component (Discussion,

Implications, Limitations, Conclusions). In addition, students will present their findings to participants, peers, faculty, and community practitioners as appropriate. Working with the faculty and site mentors, the student will prepare the finished report for professional publication/dissemination. This course is taken concurrently with OTD 784, Doctoral Experiential 4: Mentorship.

This course is graded pass/fail.

Cannot receive credit if taken OTD 780 Doctoral Experiential 4: Implementation/Capstone (10 crs.)

### **OTD 784 - Doctoral Experiential 4: Mentorship Seminar (3 crs.)**

Prerequisite: Successful completion of all previous coursework

Corequisite: OTD 781

This course is taken in conjunction with OTD 781: Doctoral Experiential 4: Implementation/Capstone and provides the student with faculty mentorship for completion of the Doctoral Experiential, including implementation of the doctoral project/study, completion of all sections of the scholarly paper, presentation of the project/study, and preparation for publication and/or dissemination.

This course is graded pass/fail.

Cannot receive credit if taken OTD 785 2 credit Doctoral Experiential 4: Mentorship

### **OTD 785 - Doctoral Experiential 4: Mentorship (2 crs.)**

Prerequisite: OTD 663

Corequisite: OTD 780

This course is taken in conjunction with OTD 780, Doctoral Experiential 4: Implementation/Capstone and provides the student with faculty mentorship for completion of the Doctoral Experiential, including implementation of the doctoral project/study, completion of all sections of the scholarly paper, presentation of the project/study, and preparation for publication and/or dissemination.

Formerly "Doctoral Residency 4: Mentorship"

This course is graded pass/fail.

## **PHAR - PHARMACY**

### **PHAR 510 - Intro to Pharmacy (1 cr)**

Prerequisite: Acceptance into 1st Year Pharmacy (Recommended, Previous).

Entering pharmacy learners will be introduced and oriented to the profession of pharmacy. They will examine the historical evolution of the pharmacist's role from one focused on drug compounding and distribution to a patient-centered practice model and interprofessional collaboration. Learners will become acquainted with pharmacy career opportunities and pathways, and learn the importance of leadership, professionalism, and involvement in pharmacy organizations. Learners will gain insight into self and professional goals through reflection and development of professional portfolios.

Offered: Fall Only

### **PHAR 511 - Drug Information & Informatics (2 cr)**

Prerequisite: Acceptance into 1st Year Pharmacy (Recommended, Previous).

Students will develop skills in providing evidence-based recommendations to both patients and other health care professionals. Learners will build upon basic drug knowledge to understand medication safety as it relates to both clinical and distributive services, as well as the implementation of quality control and assurance programs in a practice based environment. Core skills in assessing clinical questions; searching primary, secondary, and tertiary literature; and synthesizing multiple sources of information will be emphasized. Pharmacy informatics principles will be reviewed in terms of safety and efficiency improvement of the medication use process. This overall skill set will provide the foundation of drug information, medication safety, and pharmacy informatics, preparing the learner to practice evidence-based pharmacy. Poison information will also be provided periodically throughout the course.

Offered: Fall Only

### **PHAR 512 - Immunology (3 cr)**

Prerequisite: Acceptance into 1st Year Pharmacy (Recommended, Previous).

Learners will be introduced to the basic elements of the immune system. They will gain knowledge of the mechanisms of immunity which act in a wide range of clinical conditions, including: protection against infectious agents; rejection of tumors; transplantation of tissues and organs; autoimmune and other immunopathologic conditions; and allergy.

Offered: Fall Only

### **PHAR 513 - Biochemistry (3 cr)**

Prerequisite: Acceptance into 1st Year Pharmacy (Recommended, Previous).

Learners will explore the fundamental biochemical principles underlying cellular physiology and biological processes. They will gain knowledge of biomacromolecules mainly from a structural point of view. Learners will gain insight into molecular metabolic and synthetic pathways in order to provide a foundation for understanding disease states, mechanisms of drug action and drug metabolism.

Offered: Fall Only

### **PHAR 514 - Pharmaceutics I (2 cr)**

Prerequisite: Acceptance into 1st Year Pharmacy (Recommended, Previous).

Learners will study the measurement units, and mathematical functions and applications that are essential to the safe, accurate practice of pharmacy in this course. They will gain familiarity and be able to relate pharmaceutical nomenclature, numerical expressions, measurement equivalents, calculation formulas, problem analysis, and reasoning.

Offered: Fall Only

### **PHAR 516 - Pharmacy Ethics (3 cr.)**

Prerequisite: Acceptance into 1st Year Pharmacy (Recommended, Previous).

Learners will be introduced to the major ethical theories and principles of bioethics. They will also be introduced to the legal concepts that encompass the rights and responsibilities of the pharmacist and their practical application. Learners will begin to

appreciate the relationship of ethics and ethical decision making, within legal constructs, of a health care provider in a culturally diverse population.

Offered: Fall Only

### **PHAR 517 - Healthcare Policy & Delivery (2 cr)**

Prerequisite: Acceptance into 1st Year Pharmacy (Recommended, Previous).

Students will be introduced to the U.S. health care system and managed health care. The students will learn about the structure, organization, financing and delivery of health care in the United States with emphasis placed on pharmacy.

Offered: Fall Only

### **PHAR 518 - Pharmaceutical Calculations (2 cr)**

Prerequisite: Acceptance into 1st Year Pharmacy (Recommended, Previous).

Learners will explore the study of measurement units, numerical conversion or equivalency factors, and mathematical solving methods that are common and vital to the safe and accurate practice of pharmacy. Learners will focus on pharmaceutical nomenclature, measurement constants or equivalents, calculation formulas and methods, and problem analysis and solving. They will be introduced to prescription interpretation, prescription notation and abbreviations, basic pharmaceutical calculations, statistics, and the mathematics of chemical kinetics, pharmaceuticals, and pharmacokinetics.

Offered: Fall Only

### **PHAR 520 - Healthcare Communications (3 cr)**

Learners will explore effective communication methods for creating positive, therapeutic relationships. They will learn to apply written and verbal communication skills and behavioral interventions with diverse populations, including patients, families, and other healthcare providers. Learners will develop the ability to effectively interact with low literacy and non-English speaking patients. Cultural competence will be introduced to aid interactions and communications with patients possessing diverse values, beliefs, and behaviors. Skills in interviewing, active listening and empathy, assertiveness, and problem-solving will be emphasized.

Offered: Spring Only

### **PHAR 521 - Informatics & Evidence-Base Prac II (3 cr)**

Learners will build upon their knowledge of foundational concepts of informatics and evidence-based practice in this second course of the two course sequence. They will gain knowledge of the principles of pharmacoepidemiology as it relates to population outcomes and medication safety monitoring. Learners will relate clinical application of drug literature to patient populations and gain understanding in the difference of statistical versus clinical significance in small group journal clubs.

Offered: Spring Only

### **PHAR 522 - Pathophysiology (3 cr)**

Learners will gain understanding of the basic principles and mechanisms of disease, including inflammation and repair, degeneration, disturbances on hemodynamics, developmental defects, and neoplasia. They will focus on select disease states of organ systems with the goal of providing a rationale for drug therapy.

Offered: Spring Only

### **PHAR 523 - Genetics & Genomics (2 cr)**

Students will learn the basic principles and processes involved in genetic inheritance and gene expression. In addition, students will explore how genetic variation arises and is the basis for a number of diseases and individual responses to environmental factors, including medication therapy. Students will be introduced to basic pharmacological concepts, such as pharmacokinetic and pharmacodynamic processes. Variation in therapeutic response in patients will be linked to genetic variation of the proteins involved in these pharmacological processes. Students will explore various resources that can be used to guide the use genetic patient information for developing therapeutic recommendations. The ethical, legal, and social implications of utilizing genetic information clinically, will also be discussed.

Offered: Spring Only

### **PHAR 524 - Pharmaceutics II (2 cr)**

Learners will gain knowledge of medicinal formulations and physical/chemical properties of drugs. They will investigate the stability of compounded products, quality control, sterilization, biotechnology preparations, and pharmaceutical compounding using the foundational principles of pharmaceutical calculations. Learners will explore the process by which dosage form affects drug absorption, distribution, metabolism and elimination.

Offered: Spring Only

### **PHAR 525 - Pharmaceutics II Lab (1 cr)**

Learners will examine the legal, practical and scientific bases of drug products and pharmaceutical delivery systems. They will apply their knowledge of physicochemical theories, terminology, and pharmaceutical skills in the preparation of oral and topical formulations.

Offered: Spring Only

### **PHAR 526 - Pharmacy Outcomes (2 cr.)**

Learners will gain an understanding of how pharmacoeconomic, clinical, and humanistic outcomes relate to the provision of pharmacy care in various health care areas. They will review trends in innovative service provision, examine systems for patient care improvement, describe key concepts in outcomes management, and discuss successful cases from the professional literature.

Offered: Spring Only

### **PHAR 527 - Self Care Therapeutics (3 cr)**

In this early exposure, learners will acquire a knowledge base of community pharmacy practice. Learners will begin to gain insight and develop a sense of community involvement in pharmacy practice by shadowing and applying basic pharmacy care. Through observation and participation, learners will explore the various facets of community pharmacy practice by integrating communication skills and relating didactic instruction to civic involvement, humanistic care of patients, and social awareness of unmet medical needs. This may include, but is not limited to: companionship; patient care; medication-related services; screening for medical problems; dispensing pharmaceuticals; medication counseling; purchasing; inventory control; and varying management styles. Learners will gain insight into self and professional goals through reflection and continued development of professional portfolios. An on-campus orientation will be required for all learners prior to starting their IPPEs. Learners will give presentations at the end of the semester.

Offered: Spring Only

### **PHAR 528 - Intro to Pharmacy & Health Prof II (1 cr)**

The pharmacy learner will continue to be introduced to various pharmacy career paths and opportunities, examine the history of pharmacy and explore more healthcare professions in this second course of the two course series. Learners will become acquainted with pharmacy career opportunities and pathways, and learn the importance of leadership, professionalism, and involvement in pharmacy organizations. They will examine the historical evolution of the pharmacist's role from one focused on drug compounding and distribution to a patient-centered practice model and interprofessional collaboration. Learners will continue the process of thinking as a team member by reviewing similarities and differences in communication techniques among various healthcare professionals. Learners will gain insight into self and professional goals through reflection.

Offered: Spring Only

### **PHAR 533 - Indep Study in Phar (1 cr)**

Offered: Fall Only

### **PHAR 534 - Indep Study in Phar (1 cr)**

Offered: Spring Only

### **PHAR 540 - IPPE Health Services (2 cr)**

This course is based on the College of Pharmacy's outcome statements and accreditation standards for introductory pharmacy practice experience. In this rotation, learners will build a knowledge base of institutional pharmacy practice. Learners will gain insight and develop a sense of involvement in institutional pharmacy practice by applying basic pharmacy care within various aspects of the health system. Through observation and participation, learners will explore the various facets of health system pharmacy practice by integrating communication skills and relating didactic instruction to clinical involvement, humanistic care of patients, and social awareness of unmet medical needs. This may include, but is not limited to: patient care; medication-related services; screening for medical problems using a collaborative approach; and working within organizational structures with varying management styles. Learners will also develop an appreciation of various practice modalities, inclusive of, but not limited to: prescriber order entry systems, electronic medical records, prescription automation and informatics, purchasing, formulary control, medical teams, research, and committees. Learners will continue to gain insight into self and professional goals through reflection and on-going development of professional portfolios.

Offered: Spring Only

### **PHAR 541 - IPPE Community (2 cr)**

In this early exposure, learners will acquire a knowledge base of community pharmacy practice. Learners will begin to gain insight and develop a sense of community involvement in pharmacy practice by applying basic pharmacy care. Through observation and participation, learners will explore the various facets of community pharmacy practice by integrating communication skills and relating didactic instruction to civic involvement, humanistic care of patients, and social awareness of unmet medical needs. This may include, but is not limited to: patient care; medication-related services; screening for medical problems; dispensing pharmaceuticals; medication counseling; purchasing; inventory control; and varying management styles. Learners will gain insight into self and professional goals

through reflection and continued development of professional portfolios. Learners will give presentations at the end of the semester.

Offered: Spring Only

### **PHAR 580 - Professional Development I (0 cr)**

In addition to curricular requirements, learners are required to satisfy professional development requirements. These program requirements have been selected by the College of Pharmacy to foster personal and professional growth and development. Learners will be required to develop and utilize electronic portfolios to document professional experiences (e.g., meetings, activities, assignments), track community service, and reflect upon and assess learning activities and experiences. The learners' academic advisors will review and assess the portfolios and provide the learner feedback. The portfolio requirements for each academic year must be satisfied in order for learners to progress into the next academic year. As directed by the Associate/Assistant Dean for Academic Affairs, learners will meet on campus for portfolio development, assessment activities, and Dean's Seminar. Dean's Seminar provides learners with insight into current pharmacy and health care-related issues through guest presentations.

### **PHAR 590 - Special Topics in Pharmacy (1 cr)**

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

Offered: Fall Only

### **PHAR 591 - Special Topics in Pharmacy (1 cr)**

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

Offered: Spring Only

### **PHAR 610 - Principles of Pharmacokinetics (4 cr)**

Prerequisite: Acceptance into 2nd Year Pharmacy (Recommended, Previous).

Learners will study the theoretical, mathematical, and functionally dependent physiologic relationships that comprise the quantitative basis for determining population and patient-specific drug dosage regimens. Learners will focus on the rate, time course, and extent of drug absorption, distribution, and elimination. They will utilize data of drug plasma concentrations in order to calculate and monitor safe and effective drug dosing regimens. Learners will practice fundamental pharmacokinetics concepts by calculating population and patient-specific dosage regimen of selected drugs used in various disease states.

Offered: Fall Only

### **PHAR 611 - Principles of Pharmacology (3 cr)**

Prerequisite: Acceptance into 2nd Year Pharmacy (Recommended, Previous).

Learners will explore the basic physiological, pathophysiological and biochemical foundations for the interaction of drugs with biological systems. Topics will include pharmacological principles such as mechanism of action, pharmacodynamics, drug-drug interactions, adverse reactions, and factors that can alter expected pharmacologic results. Autonomic drugs are used to illustrate pharmacological principles associated with pharmacotherapy that will be required for learners to build upon in future courses.

Offered: Fall Only

**PHAR 612 - Principles of Medicinal Chemistry (3 cr)**

Prerequisite: Acceptance into 2nd Year Pharmacy (Recommended, Previous).

Learners will be introduced to the general principles of drug action at the molecular-level. They will focus on the physical, chemical, and biochemical properties of drug substances; the relationships between chemical structure and pharmacological activity; the molecular basis for drug-receptor interactions; and drug metabolism.

Offered: Fall Only

**PHAR 614 - Patient Assessment Skills Lab (1 cr)**

Prerequisite: Acceptance into 2nd Year Pharmacy (Recommended, Previous).

Learners will be introduced to basic patient assessment skills, including patient interview, physical assessment, and laboratory parameter evaluation. Learners will receive hands-on training with health assessment devices, and explanation of the practical operation and function of self-care diagnostic products. They will refine and apply verbal and written communication skills in a standardized patient care encounter setting and its associated documentation in the SOAP format.

Offered: Fall Only

**PHAR 615 - Professional Pharmacy Practice Lab (1 cr)**

Prerequisite: Acceptance into 2nd Year Pharmacy (Recommended, Previous).

Learners will acquire the necessary skills for dispensing drugs, in this competency-based course, as they relate to community, hospital, home healthcare, and long-term care settings. Learners will gain knowledge of the technical aspects of dispensing drug products, medication errors and safety controls, controlled substances, third party reimbursement, pharmacy ethics, and supervisory skills. They will become familiar with informatics and automation commonly found in practice settings.

Offered: Fall Only

**PHAR 616 - Practice Management I (2 cr)**

Prerequisite: Acceptance into 2nd Year Pharmacy (Recommended, Previous).

The Pharmacy Practice Management course series cover primary management functions performed by pharmacists in diverse practice settings. The overarching goals for the course are to prepare students to manage challenges in their practice settings and expand their roles to provide innovative patient care services. Students will explore content on leadership, human resources management, pharmacy operations, entrepreneurship and financial analysis among others. Furthermore, the Innovative Advanced Pharmacy Services Project provides the opportunity for students to develop a business proposal, which culminates in a poster session at the end of the Spring semester. Effective health care delivery requires an understanding of the complex clinical and business systems in which pharmacy exists. Student pharmacists need to possess the business acumen to develop, manage, and evaluate their future practice profitably.

Offered: Fall Only

**PHAR 620 - Self Care Therapeutics (3 cr)**

Learners will review the selection of nonprescription products for the self-treatment of common disorders. Learners will become prepared to evaluate patients who can safely and effectively be treated with

nonprescription treatments. Learners will familiarize themselves with nonprescription medications, herbals, vitamins, homeopathic products, and medical devices used by patients for self-treatment of common disorders.

Offered: Spring Only

**PHAR 621 - Integrated Pharmacy Care- Renal (2 cr)**

Learners will review the physiologic/pathophysiologic alterations in the aged and pediatric populations. They will examine the medicinal chemistry; pharmacology; kinetics; social and administrative issues; and the specific therapeutic management in these populations. Common issues in special populations and special environments will also be explored.

Offered: Spring Only

**PHAR 622 - Integrated Pharmacy Care- Respiratory (2 cr)**

Learners will gain knowledge of pathophysiology and clinical presentation of common diseases of the renal system. They will integrate medicinal chemistry; pharmacology; kinetics; and social and administrative sciences of common therapeutic agents used to treat renal diseases in order to provide and recommend optimal pharmacotherapeutic management.

Offered: Spring Only

**PHAR 623 - Integrated Pharmacy Care - CVS I (2 cr)**

Learners will gain knowledge of pathophysiology and clinical presentation of common diseases of the cardiovascular system and associated risk factors. They will integrate medicinal chemistry; pharmacology; kinetics; and social and administrative sciences of common therapeutic agents used to treat cardiovascular disease and risk factors in order to provide and recommend optimal pharmacotherapeutic management.

Offered: Spring Only

**PHAR 624 - Integrated Pharmacy Care - CVS II (2 cr)**

Learners will gain knowledge of pathophysiology and clinical presentation of common diseases of the cardiovascular system. They will integrate medicinal chemistry; pharmacology; kinetics; and social and administrative sciences of common therapeutic agents used to treat complicated cardiovascular disease states in order to provide and recommend optimal pharmacotherapeutic management.

Offered: Spring Only

**PHAR 625 - Applied Pharmacy Care I (1 cr)**

Learners will apply the processes of problem solving, critical thinking, abstract thinking, and differential diagnosis to optimize and manage pharmacy care with common disease states. They will apply information learned in the didactic integrated course sequences to patient care scenarios using problem-based learning methods. Learners will transition from dependence to independence in the learning process through this three course sequence which is built on the premise of "see one, do one, teach one." Faculty will present and discuss health care problems (cases) and facilitate group activities in the process of problem resolution.

Offered: Spring Only

**PHAR 626 - Practice Management II (2 cr)**

The Pharmacy Practice Management course series cover primary management functions performed by pharmacists in diverse practice settings. The overarching goals for the course are to prepare students to manage challenges in their practice settings and expand their roles to provide innovative patient care services. Students will explore content on leadership, human resources management, pharmacy operations, entrepreneurship and financial analysis among others. Furthermore, the Innovative Advanced Pharmacy Services Project provides the opportunity for students to develop a business proposal, which culminates in a poster session at the end of the Spring semester. Effective health care delivery requires an understanding of the complex clinical and business systems in which pharmacy exists. Student pharmacists need to possess the business acumen to develop, manage, and evaluate their future practice profitably.

Offered: Spring Only

### **PHAR 627 - Sterile Products Lab (1 cr)**

Learners will gain skills in aseptic technique, administration, and quality assurance procedures for sterile products. They will gain knowledge and experience compounding sterile preparations, utilizing infusion devices and catheters, and applying clean room and USP 797 requirements.

Offered: Spring Only

### **PHAR 628 - Drug Lit Eval & Evidence-Based Practice (3 cr)**

Offered: Spring Only

### **PHAR 631 - Indep Study in Phar (1 cr)**

### **PHAR 632 - Indep Study in Phar (1 cr)**

### **PHAR 633 - Indep Study in Phar (1 cr)**

Offered: Fall Only

### **PHAR 634 - Indep Study in Phar (1 cr)**

Offered: Spring Only

### **PHAR 635 - Indep Study in Phar (3 cr)**

### **PHAR 642 - IPPE Community (2 cr)**

Prerequisite: Acceptance into 1st Year Pharmacy (Recommended, Previous).

Learners will develop a deeper sense of community involvement in pharmacy practice through extended exposure to and application of community pharmacy practice. Learners will continue to expand their understanding of various practice modalities covered in PHAR 541. Learners will continue their exploration of the various facets of community pharmacy practice by integrating communication skills and relating didactic instruction to civic involvement, humanistic care of patients, and social awareness of unmet medical needs. This may include, but is not limited to: patient care; medication-related services; screening for medical problems; dispensing pharmaceuticals; medication counseling; purchasing; inventory control; and varying management styles. Learners will continue to gain insight into self and professional goals through reflection and continued development of professional portfolios. Learners will give presentations at the end of the semester.

Offered: Fall Only

### **PHAR 643 - IPPE Health System (2 cr)**

Prerequisite: Acceptance into 1st Year Pharmacy (Recommended, Previous).

In this early exposure, learners will begin to build a knowledge base of institutional pharmacy practice. Learners will gain insight and develop a sense of involvement in institutional pharmacy practice by applying basic pharmacy care within various aspects of the health system. Through observation and participation, learners will explore the various facets of health system pharmacy practice grating communication skills and relating didactic instruction to clinical involvement, humanistic patients, and social awareness of unmet medical needs. This may include, but is not limited to: care; medication-related services; screening for medical problems using a collaborative approach; and working within organizational structures with varying management styles. Learners will also develop an appreciation of various practice modalities, inclusive of, but not limited to: prescriber order entry systems, electronic medical records, prescription automation and informatics, purchasing, formulary control, medical teams, research, and committees. Learners will continue to gain insight into self and professional goals through reflection and on-going development of professional portfolios: Learners will give presentations at the end of the semester.

Offered: Fall Only

### **PHAR 650 - The Evolution of Pharmacy (3 cr)**

Prerequisite: 2nd/3rd Year Pharmacy (Recommended, Previous).

Learners will study the history and culture of the pharmacy profession from pre-historic times to the present day, starting with the ancient civilizations and progressing to modern U.S. practice. In the modern era, learners will review current pharmacy institutions and practices, performing a thorough look at the history, purpose and function of the institutions and practices within the profession. The historical context, status, and roles of those who practice pharmacy will also be covered.

Offered: Fall Only

### **PHAR 656 - Drug Discovery & Development (3 cr)**

Learners will explore the steps involved in identifying and developing a novel therapeutic agent from bench to bedside. They will begin with exposure to the various processes that identify lead compounds. The optimization of lead compounds into potential therapeutic agents through preclinical cellular and animal modeling will be examined. Learners will then be guided through the FDA approval process of new compounds and the continued monitoring of approved pharmaceuticals.

### **PHAR 657 - Mgmt Acute Overdoses & Poisonings (3 cr)**

Prerequisite: 2nd/3rd Year Pharmacy (Recommended, Previous).

Learners will become familiarized with the presentation, assessment, and management of acute toxicity from common medications, natural toxins and envenomation, occupational and environmental toxins, chemicals and household products. Learners will engage in case-based activities relative to acute overdose and poisoning. The course will emphasize the role of pharmacists in prevention and management of poisoning.

### **PHAR 659 - Drugs of Abuse (3 cr)**

Prerequisite: 2nd/3rd Year Pharmacy (Recommended, Previous).

A fundamental aspect of the course will be to expose the learners to the impacts that drug abuse have on today's society. Learners will

become familiar with the basic history, pharmacology/medicinal chemistry, and withdrawal of the most commonly abused drugs. Learners are expected to present a topic of their choice that integrates the subject matter from two or more of the lectures presented throughout the course.

### **PHAR 663 - Pharmaceut Industry in a Global Context (3 cr)**

Prerequisite: 2nd/3rd Year Pharmacy (Recommended, Previous).

Learners will gain an understanding of drug approval process, role of contract research organizations, principles of pharmaceutical marketing and market access as well as principles of pricing and financing of pharmaceuticals on individual country levels. They will be able to assess the role of innovator and generic pharmaceutical companies in development of breakthrough agents and facilitation of earlier access to lower cost alternatives. In addition, learners will be exposed to the current controversies facing the industry, including loopholes in the regulatory environment delaying earlier generic introductions, ethics of conducting clinical trials in the developing world, deceptive marketing practices and the challenges of medical and regulatory establishments in protecting public health and ensuring patient access to safe and effective medications. The course may be of interest to learners considering careers in pharmaceutical industry, regulatory agencies, managed care organizations, consulting and analytics as well as those interested in gaining insight about the world of pharmaceuticals outside of the walls of community pharmacy.

### **PHAR 680 - Professional Development II (0 cr)**

In addition to curricular requirements, learners are required to satisfy professional development requirements. These program requirements have been selected by the College of Pharmacy to foster personal and professional growth and development. Learners will be required to develop and utilize electronic portfolios to document professional experiences (e.g., meetings, activities, assignments), track community service, and reflect upon and assess learning activities and experiences. The learners' academic advisors will review and assess the portfolios and provide the learner feedback. The portfolio requirements for each academic year must be satisfied in order for learners to progress into the next academic year. As directed by the Associate/Assistant Dean for Academic Affairs, learners will meet on campus for portfolio development, assessment activities, and Dean's Seminar. Dean's Seminar provides learners with insight into current pharmacy and health care-related issues through guest presentations.

### **PHAR 690 - Special Topics in Pharmacy (3 cr)**

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

### **PHAR 691 - Special Topics in Pharmacy (3 cr)**

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

### **PHAR 692 - Special Topics Pharmacy (3 cr)**

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

### **PHAR 693 - Special Topics Pharmacy (3 cr)**

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

### **PHAR 694 - Special Topics Pharmacy (3 cr)**

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

### **PHAR 710 - Integrated Pharmacy Care-GI/Nutr/Hep (3 cr)**

Prerequisite: 3rd Year Pharmacy Student (Recommended, Previous).

Learners will gain knowledge of the pathophysiological and clinical presentation of common gastrointestinal, nutritional and hepatic disorders. They will integrate their knowledge of the biomedical, pharmaceutical, social/behavioral/administrative, and clinical sciences of therapeutic agents used to treat common gastrointestinal, nutritional and hepatic disorders in order to provide and recommend optimal pharmacotherapeutic management.

Offered: Fall Only

### **PHAR 711 - Integrated Pharmacy Care-Endo/Repro/Gu (3 cr)**

Prerequisite: 3rd Year Pharmacy Student (Recommended, Previous).

Learners will gain knowledge of the pathophysiological and clinical presentation of common disorders of the endocrine, reproductive and genitourinary system. They will integrate their knowledge of the biomedical, pharmaceutical, social/behavioral/administrative, and clinical sciences of therapeutic agents used to treat common endocrine, reproductive, and genitourinary disorders in order to provide and recommend optimal pharmacotherapeutic management.

Offered: Fall Only

### **PHAR 712 - Integrated Pharmacy Care-Infect Dis I (2 cr)**

Prerequisite: 3rd Year Pharmacy Student (Recommended, Previous).

Learners will gain knowledge of the pathophysiological and clinical presentation of common infectious diseases. They will integrate their knowledge of the biomedical, pharmaceutical, social/behavioral/administrative, and clinical sciences of therapeutic agents used to treat common infectious diseases in order to provide and recommend optimal pharmacotherapeutic management.

Offered: Fall Only

### **PHAR 713 - Integrated Pharmacy Care-Infect Dis II (2 cr)**

Prerequisite: 3rd Year Pharmacy Student (Recommended, Previous).

Learners will gain knowledge of the pathophysiological and clinical presentation of complicated infectious diseases. They will integrate their knowledge of the biomedical, pharmaceutical, social/behavioral/administrative, and clinical sciences of therapeutic agents used to treat complicated infectious diseases in order to provide and recommend optimal pharmacotherapeutic management.

Offered: Fall Only

### **PHAR 715 - Applied Pharmacy Care II (1 cr)**

Prerequisite: 3rd Year Pharmacy Student (Recommended, Previous).

Learners will continue to apply the processes of problem solving, critical thinking, abstract thinking, and differential diagnosis in order to optimize and manage pharmacy care with common disease states. They will apply information learned in the didactic integrated course sequences to patient care scenarios using problem-based learning methods. Learners will transition from dependence to independence in the learning process through this three course sequence which is built on the premise of "see one, do one, teach one." Learners will

present and discuss health care problems (cases) within faculty facilitated groups to help in the process of patient problem resolution.

Offered: Fall Only

### **PHAR 716 - Sterile Products Lab (1 cr)**

Learners will gain skills in aseptic technique, administration, and quality assurance procedures for sterile drug products. They will gain knowledge and experience compounding sterile preparations, utilizing infusion devices and catheters, and applying clean room and USP 797 requirements.

### **PHAR 718 - Pharmacy Law I ( 2 cr)**

Prerequisite: 3rd Year Pharmacy Student

This is the first semester of the two-semester Pharmacy Law course. Throughout the two semesters of this course, both introductory legal concepts and pharmacy law models will be presented to exemplify and encompass the rights and responsibilities of a practicing pharmacist. Learners will explore the federal and state laws, regulations, executive orders, policies, and advisories/guidelines that impact upon the practice of pharmacy, as well as the development and preparation of pharmaceuticals. In addition, learners will have the opportunity to develop their skills at researching, reading, and understanding applicable pharmacy law. As such, learners should gain the ability to develop and expand their knowledge of pharmacy and practice law; thus, maintaining their proficiency at interpreting and understanding applicable law to pass the applicable MPJE and maintain their competency throughout their careers.

### **PHAR 720 - Integrated Pharmacy Care-Derm/Musc (2 cr)**

Learners will gain knowledge of the pathophysiological and clinical presentation of common disorders of the musculoskeletal and dermatological systems. They will integrate their knowledge of the biomedical, pharmaceutical, social/behavioral/administrative, and clinical sciences of therapeutic agents used to treat common disorders of the musculoskeletal and dermatological systems in order to provide and recommend optimal pharmacotherapeutic management.

Offered: Spring Only

### **PHAR 721 - Integrated Pharmacy Care-Neuro/CNS (2 cr)**

Learners will gain knowledge of the pathophysiological and clinical presentation of common disorders of the neurological system and sensory organs. They will integrate their knowledge of the biomedical, pharmaceutical, social/behavioral/administrative, and clinical sciences of therapeutic agents used to treat common neurological and sensory organ disorders in order to provide and recommend optimal pharmacotherapeutic management.

Offered: Spring Only

### **PHAR 722 - Integrated Pharmacy Care-Psych (3 cr)**

Learners will gain knowledge of the pathophysiological and clinical presentation of common behavioral and cognitive disorders. They will integrate their knowledge of the biomedical, pharmaceutical, social/behavioral/administrative, and clinical sciences of therapeutic agents used to treat common behavioral and cognitive disorders in order to provide and recommend optimal pharmacotherapeutic management.

Offered: Spring Only

### **PHAR 723 - Integrated Pharmacy Care-Heme/Onc (3 cr)**

Learners will gain knowledge of the pathophysiological and clinical presentation of common cancers, disorders of the blood and lymphatic systems, and the related symptomatology of these disorders and their treatments. They will integrate their knowledge of the biomedical, pharmaceutical, social/behavioral/administrative, and clinical sciences of therapeutic agents used to treat common cancers; blood and lymphatic disorders; and related complications in order to provide and recommend optimal pharmacotherapeutic management.

Offered: Spring Only

### **PHAR 724 - Integrated Pharmacy Care-Spec Population (2 cr)**

Learners will review the physiologic/pathophysiologic alterations in the aged and pediatric populations. They will integrate pharmacy care through consideration of the biomedical, pharmaceutical, social/behavioral/administrative, and clinical science principles specific to these populations. Common disorders and conditions in special populations and special environments will also be explored.

Offered: Spring Only

### **PHAR 725 - Applied Pharmacy Care III (1 cr)**

Learners will apply, in an advanced independent manner, the processes of problem-solving, critical thinking, abstract thinking and differential diagnosis to optimize and manage pharmacy care with common disease states. They will apply information learned in the didactic integrated course sequences to patient care scenarios using problem-based learning methods. Learners will transition from dependence to independence in the learning process through this three course sequence which is built on the premise of "see one, do one, teach one." Learners will lead discussions and teach one another to resolve health care problems using patient cases, within faculty facilitated groups.

Offered: Spring Only

### **PHAR 727 - Patient Care Management (3 cr)**

Students will apply knowledge, skills, and abilities learned throughout the first five semesters of the curriculum in this capstone course, which focuses on patient care management in acute, ambulatory, and community care settings. Students will practice these aspects in simulated patient care environments as part of a health care team. Students will review important knowledge, judgment, and skills necessary to prepare for PY-4 Advanced Pharmacy Practice Experiences (APPEs).

Offered: Spring Only

### **PHAR 728 - Pharmacy Law II (2 cr)**

Prerequisite: 3rd Year Pharmacy Student

This is the second semester of the two-semester Pharmacy Law course. Throughout the two semesters of this course, both introductory legal concepts and pharmacy law models will be presented to exemplify and encompass the rights and responsibilities of a practicing pharmacist. Learners will explore the federal and state laws, regulations, executive orders, policies, and advisories/guidelines that impact upon the practice of pharmacy, as well as the development and preparation of pharmaceuticals. In addition, learners will have the opportunity to develop their skills at researching, reading, and understanding applicable pharmacy law. As such, learners should gain the ability to develop and expand their knowledge of pharmacy and practice law; thus, maintaining their proficiency at interpreting and understanding applicable law to pass



the applicable MPJE and maintain their competency throughout their careers.

### **PHAR 733 - Indep Study in Phar (1 cr)**

Offered: Fall Only

### **PHAR 734 - Indep Study in Phar (1 cr)**

Offered: Spring Only

### **PHAR 744 - IPPE Health System (2 cr)**

Prerequisite: Acceptance into 3rd Year Pharmacy (Recommended, Previous).

Learners will develop a deeper sense of involvement in institutional pharmacy practice. Learners will be exposed to and apply pharmacy care within various aspects of the health system. Learners will continue to expand their understanding of various practice modalities covered in PHAR 643. They will explore the various facets of health system pharmacy practice by integrating communication skills and relating didactic instruction to clinical involvement, humanistic care of patients, and social awareness of unmet medical needs. This may include, but is not limited to: patient care; medication therapy-related services; medication reconciliation; clinic management; provider interactions; screening for medical problems using a collaborative practice approach; committee meetings; and working within organizational structures with varying management styles. Learners will increase their insight into self and professional goals through reflection and on-going development of professional portfolios. Learners will give presentations at the end of the semester.

Offered: Fall Only

### **PHAR 745 - IPPE Community (2 cr)**

Prerequisite: Acceptance into 3rd Year Pharmacy (Recommended, Previous).

This course is based on the College of Pharmacy's outcome statements and accreditation standards for introductory pharmacy practice experience. In this rotation, learners will acquire a knowledge base of community pharmacy practice. Learners will gain insight and develop a sense of community involvement in pharmacy practice by applying basic pharmacy care. Through observation and participation, learners will explore the various facets of community pharmacy practice by integrating communication skills and relating didactic instruction to clinical involvement, humanistic care of patients, and social awareness of unmet medical needs. This may include, but is not limited to: patient care; medication-related services; screening for medical problems; dispensing pharmaceuticals; medication counseling; purchasing; inventory control; and varying management styles. Learners will gain insight into self and professional goals through reflection and continued development of professional portfolios.

Offered: Fall Only

### **PHAR 756 - Cardiovasc Electrophysiol Bench-Bed (3 cr.)**

Learners will explore the biophysics of cardiac ion channels, impulse conduction and control, molecular genetics, and pharmacogenomics of ion channel dysfunctions. Learners will also gain significant insight into mechanisms causing arrhythmias, interpretation of ECG recordings, and management of arrhythmias. This course will use combination of classroom based presentations and simulated patient experiences using the high fidelity suite.

### **PHAR 780 - Professional Development III (0 cr.)**

In addition to curricular requirements, learners are required to satisfy professional development requirements. These program requirements have been selected by the College of Pharmacy to foster personal and professional growth and development. Learners will be required to develop and utilize electronic portfolios to document professional experiences (e.g., meetings, activities, assignments), track community service, and reflect upon and assess learning activities and experiences. The learners' academic advisors will review and assess the portfolios and provide the learner feedback. The portfolio requirements for each academic year must be satisfied in order for learners to progress into the next academic year. As directed by the Associate/Assistant Dean for Academic Affairs, learners will meet on campus for portfolio development, assessment activities, and Dean's Seminar. Dean's Seminar provides learners with insight into current pharmacy and health care-related issues through guest presentations.

Offered: Fall Only

### **PHAR 790 - Amb Care (3 cr.)**

Prerequisite: 2nd/3rd Year Pharmacy (Recommended, Previous).

This elective course is designed to examine selected aspects of critical care medicine. Topic will include a specific focus on diagnosis, treatment choices, monitoring parameters and therapeutic outcome in the adult ICU patients. Faculty will present topics using patient care scenarios and facilitate group activities. Learners will develop clinical skills of problem solving and critical thinking in order to provide optimal critical care management. Learners will also gain an in-depth understanding of the pharmacist's role in the treatment of the critically ill patients.

### **PHAR 791 - To Err Is Human (3 cr.)**

Prerequisite: 2nd/3rd Year Pharmacy (Recommended, Previous).

Learners will learn the concepts behind personal health, wellness, and fitness and how they all relate directly to disease and disease state management. Learners will become prepared to evaluate, design, and implement lifestyle changes and design plans for patients based on cases from the Community Patient Care Center.

### **PHAR 792 - Special Topics Pharmacy (3 cr.)**

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

### **PHAR 793 - Special Topics Pharmacy (3 cr.)**

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

### **PHAR 794 - Special Topics Pharmacy (3 cr.)**

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

### **PHAR 800 - APPE Ambulatory Care (6 cr)**

Prerequisite: Acceptance into 4th Year Pharmacy (Recommended, Previous).

Within the Advanced Pharmacy Practice Experience in Ambulatory Care Practice, learners are assigned to ambulatory care pharmacy settings where they will participate in clinical pharmacy services and patient care activities such as: taking medication histories; monitoring drug therapy; recommending changes in medications; reconciling medication; writing progress notes; performing physical

assessments; providing patient education; conducting research; reviewing drug utilization; reporting adverse drug reaction; attending committee meetings; and interacting with other members of the health care team. Learners are expected to apply prior knowledge and apply new knowledge, as necessary, to demonstrate the ability to render guided patient care along with sound clinical judgment under the supervision of a preceptor.

### **PHAR 801 - APPE Acute Care (6 cr)**

Prerequisite: Acceptance into 4th Year Pharmacy (Recommended, Previous).

Within the Advanced Pharmacy Practice Experience in Acute Care Practice, learners are assigned to acute care settings where they will participate in clinical pharmacy services and patient care activities, such as: attending clinical rounds; managing medication safety; taking medication histories; monitoring drug therapy; monitoring laboratory data; providing patient education; and researching patient-specific drug information questions. Learners will interact with a number of different health care providers and participate in a variety of patient care activities with the pharmacy preceptor and medical team. Learners are expected to apply prior knowledge and apply new knowledge, as necessary, to demonstrate the ability to render guided patient care and sound clinical judgment under the supervision of a preceptor.

### **PHAR 802 - APPE Community Care (6 cr)**

Prerequisite: Acceptance into 4th Year Pharmacy (Recommended, Previous).

Within the Advanced Pharmacy Practice Experience in Community Care Practice, learners are assigned to community pharmacies where they will integrate the principles of pharmacy care and pharmaceutical sciences with practice situations. Activities include: processing prescriptions; medication counseling; interacting with medical personnel via telephone or in person; pharmacy administration (management, ordering, and inventory control); advising on nonprescription medications; and applying pharmacy law. Learners are expected to apply prior knowledge and apply new knowledge, as necessary, to demonstrate the ability to render guided patient care and sound clinical judgment under the supervision of a preceptor.

### **PHAR 803 - APPE Institutional (6 cr)**

Prerequisite: Acceptance into 4th Year Pharmacy (Recommended, Previous).

Within the Advanced Pharmacy Practice Experience in Institutional Practice, learners are assigned to hospital pharmacies where they will participate in hospital practice activities such as: prescriber order entry systems; electronic medical records; prescription automation and informatics; purchasing; formulary and inventory control; interacting with interprofessional teams; attending committee meetings; pharmacy administration; distributing medications; preparing IV admixtures; conducting research; and completing chart reviews. Learners are expected to apply prior knowledge and apply new knowledge, as necessary, to demonstrate the ability to render guided patient care and sound clinical judgment under the supervision of a preceptor.

### **PHAR 804 - APPE Elective (6 cr)**

Prerequisite: Acceptance into 4th Year Pharmacy (Recommended, Previous).

Within the Advanced Pharmacy Practice Elective Experiences, learners will be able to choose from a variety of advanced pharmacy practice experiences in areas such as: administration, specialized pharmacy care (cardiology, pediatrics, geriatrics, oncology/hematology, psychiatry, etc), research, home health care, industry, and long term care. Learners must complete two elective experiences. Some elective experiences will be in non-traditional pharmacy practice settings. However, one elective must be a direct patient care rotation. Learners are expected to apply prior knowledge and apply new knowledge, as necessary, to demonstrate the ability to render guided patient care and sound clinical judgment under the supervision of a preceptor.

Offered: Spring Only

Formerly APPE Elective I Patient Care

### **PHAR 805 - APPE Elective (6 cr)**

Prerequisite: Acceptance into 4th Year Pharmacy (Recommended, Previous).

Within the Advanced Pharmacy Practice Elective Experiences, learners will be able to choose from a variety of advanced pharmacy practice experiences in areas such as: administration, specialized pharmacy care (cardiology, pediatrics, geriatrics, oncology/hematology, psychiatry, etc), research, home health care, industry, and long term care. Learners must complete two elective experiences. Some elective experiences will be in non-traditional pharmacy practice settings. However, one elective must be a direct patient care rotation. Learners are expected to apply prior knowledge and apply new knowledge, as necessary, to demonstrate the ability to render guided patient care and sound clinical judgment under the supervision of a preceptor.

Offered: Spring Only

Formerly APPE Elective II Patient Care

### **PHAR 806 - Research Project (1 cr)**

This is an applied research project conducted with a faculty advisor, with the end result being a poster or podium presentation. Learners will identify a research project; develop a methodology to conduct the research; gather and analyze data; identify conclusions and implications, and present a poster or podium presentation, on campus.

Offered: Spring Only

### **PHAR 807 - APPE Non-Patient Care Elective (6 cr)**

Prerequisite: Acceptance into 4th Year Pharmacy (Recommended, Previous).

Learners are assigned to a variety of advanced pharmacy practice settings in management, academia, informatics, and research. Each rotation will have specific objectives, in addition to the general ones below, which will be determined in writing by the preceptor with input by the learner at the beginning of the rotation. This rotation will optimize the learners' opportunities for professional growth and skills. Learners are expected to apply prior knowledge and apply new knowledge to demonstrate the ability to render guided patient care and sound clinical judgment under the supervision of a preceptor. Learner involvement within the rotation will require active participation and the demonstration of semi-independent practice under the guidance of a preceptor for the course content topics identified.

### **PHAR 808 - APPE Non-Patient Care Elective (6 cr)**

Learners are assigned to a variety of advanced pharmacy practice settings in management, academia, informatics, and research. Each rotation will have specific objectives, in addition to the general ones below, which will be determined in writing by the preceptor with input by the learner at the beginning of the rotation. This rotation will optimize the learners' opportunities for professional growth and skills. Learners are expected to apply prior knowledge and apply new knowledge to demonstrate the ability to render guided patient care and sound clinical judgment under the supervision of a preceptor. Learner involvement within the rotation will require active participation and the demonstration of semi-independent practice under the guidance of a preceptor for the course content topics identified.

### **PHAR 833 - Indep Study in Phar (2 cr)**

### **PHAR 834 - Indep Study in Phar (2 cr)**

### **PHAR 880 - Professional Development IV (0 cr)**

In addition to curricular requirements, learners are required to satisfy professional development requirements. These program requirements have been selected by the College of Pharmacy to foster personal and professional growth and development. Learners will be required to develop and utilize electronic portfolios to document professional experiences (e.g., meetings, activities, assignments), track community service, and reflect upon and assess learning activities and experiences. The learners' academic advisors will review and assess the portfolios and provide the learner feedback. The portfolio requirements for each academic year must be satisfied in order for learners to progress into the next academic year. As directed by the Associate/Assistant Dean for Academic Affairs, learners will meet on campus for portfolio development, assessment activities, and Dean's Seminar. Dean's Seminar provides learners with insight into current pharmacy and health care-related issues through guest presentations.

## **PHRSC - PHARMACEUTICAL SCIENCES**

### **PHRSC 510 - Seminar & Journal Club 1 (1 cr.)**

This is the first course in a series of courses whose purpose is to train the student in the skills of critically reviewing published reports and presented reports. All students are required to participate by critically evaluating and presenting at least one current published paper, asking relevant and informed questions of presenters, and writing critiques on student presentations. The goals are to train students to critically evaluate the scientific literature and provide students with the experience of making oral presentations on diverse topics.

Offered: Spring Only

### **PHRSC 520 - Seminar & Journal Club 2 (1 cr.)**

This is the second course in a series of courses whose purpose is to train the student in the skills of critically reviewing published reports and presented reports. All students are required to participate by critically evaluating and presenting at least one current published paper, asking relevant and informed questions of presenters, and writing critiques on student presentations. The goals are to train students to critically evaluate the scientific literature and provide students with the experience of making oral presentations on diverse topics.

Offered: Spring Only

### **PHRSC 526 - Analytical Techniques Lab (1 cr.)**

This course familiarizes student with the principles of instrumental techniques for quantification and identification of pharmaceuticals preparation, analysis of biological samples and statistical treatment of the data. Students will focus on sample preparation, statistical methods, and the application of different analytical techniques for research in different areas of pharmaceutical sciences.

Offered: Spring Only

### **PHRSC 527 - Data Analysis & Biostatistics (3 cr.)**

Students will learn the principles of research methodology and applied statistical analysis. Students will be able to interpret results of statistical analyses in the pharmacy literature, and perform appropriate statistical analysis of data based on the measurement scale of the study variables, research design, and study objectives. Students will learn to perform basic statistical analyses using SPSS software. Students will be able to present data analyses results both in oral and written forms. Students will familiarize with modern approaches to data analyses (e.g., machine learning).

Offered: Fall Only

### **PHRSC 528 - Thesis Research 1 (2 cr.)**

This is the first course in a series of 3 whose purpose is to train the student to conduct pharmaceutical research and make progress towards a thesis, which will need to be completed by the end of the 3 course sequence. This will include all aspects of the research process, proposing a project, developing a research plan and experimental procedures, conducting experiments, analyzing and interpreting data and recording in a scientific notebook. The class is conducted through meeting with your advisor and in the laboratories.

Offered: Spring Only

### **PHRSC 551 - Introduction to Genetics and Genetic Counseling (3 cr.)**

Students will learn about a myriad of topics, including the basis of genetics, cytogenetics, biochemical genetics, the relationships between DNA, RNA and proteins, as well as current topics in genetic testing and screening, and structure of a genetic counseling session. Students will be introduced to concepts such as Hardy-Weinberg equilibrium, population genetics, risk assessment, newborn and carrier screening programs, as well as reviewing the current state for management and treatment for genetic disorders. In addition, students will participate in role-play to understand the beginning skills needed to practice as a genetic counselor. Additional topics will include disability, cultural competency, insurance, billing and reimbursement, professionalism, and genetic discrimination and related legislation.

Offered: Fall Only

### **PHRSC 552 - Advanced Genetics and Genomics (3 cr.)**

Students will learn the basic principles and processes involved in genetic inheritance and gene expression. In addition, students will explore how genetic variation arises and is the basis for a number of diseases and individual responses to environmental factors, including medication therapy. Students will be introduced to basic pharmacological concepts, such as pharmacokinetic and pharmacodynamic processes.

Variation in therapeutic response in patients will be linked to genetic variation of the proteins involved in these pharmacological processes. Students will build skills to utilize resources that guide the use genetic patient information for developing therapeutic recommendations. The ethical, legal, and social implications of

utilizing genetic information clinically, will also be discussed.

Offered: Spring Only

**PHRSC 553 - Genetic Data Analysis - Bioinformatics (3 cr.)**

Students will be introduced to bioinformatics tools and analysis methods. Students will develop skills to analyze the vast amounts of biomedical and genomic data and to utilize online tools that will be relevant to their work in the future.

Offered: Spring Only

**PHRSC 554 - Applied Pharmacogenomics Experience (6 cr.)**

Students will work with graduate faculty on several projects related to Pharmacogenomics, including getting their own genetic testing completed and analyzing the results, evaluating direct to consumer genetic testing options, designing a research approach to test a pharmacogenomic related hypothesis, and optimizing and implementing a genetic test in the laboratory.

Offered: Summer Only

**PHRSC 555 - Clinical Pharmacogenomics Experience (6 cr.)**

Students will have the opportunity to work with clinical pharmacy faculty on projects related to Pharmacogenomics, including implementation of Pharmacogenomics testing at a clinical site. Students will also review cases in clinic, as well as case studies from the literature that utilize genetic testing to inform medication therapy.

Offered: Summer Only

**PHRSC 590 - Special Topics in Pharmaceutical Science (1-3 cr)**

Prerequisite: Enrollment in 2nd year of MSPS, or other Pharmacy Master's program.

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

Offered: Fall Only

**PHRSC 591 - Special Topics in Pharmaceutical Science (1-3 cr)**

Prerequisite: Enrollment in 2nd year of MSPS, or other Pharmacy Master's program.

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

Offered: Fall Only

**PHRSC 592 - Special Topics in Pharmaceutical Science (1-3 cr)**

Prerequisite: Enrollment in 2nd year of MSPS, or other Pharmacy Master's program.

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

Offered: Fall Only

**PHRSC 593 - Special Topics in Pharmaceutical Science (1-3 cr)**

Prerequisite: Enrollment in 2nd year of MSPS, or other Pharmacy Master's program.

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

Offered: Fall Only

**PHRSC 594 - Special Topics in Pharmaceutical Science (1-3 cr)**

Prerequisite: Enrollment in 2nd year of MSPS, or other Pharmacy Master's program.

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

Offered: Fall Only

**PHRSC 595 - Special Topics in Pharmaceutical Science (1-3 cr)**

Prerequisite: Enrollment in 2nd year of MSPS, or other Pharmacy Master's program.

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

Offered: Fall Only

**PHRSC 610 - Seminar & Journal Club 3 (1 cr.)**

This is the third course in a series of courses whose purpose is to train the student in the skills of critically reviewing published reports and presented reports. All students are required to participate by critically evaluating and presenting at least one current published paper, asking relevant and informed questions of presenters, and writing critiques on student presentations. The goals are to train students to critically evaluate the scientific literature and provide students with the experience of making oral presentations on diverse topics. Students enrolled in the second year of the MSPS program may present their own research in lieu of the scientific paper

Offered: Spring Only

**PHRSC 618 - Thesis Research 2 (2 cr.)**

This is the second course in a series of 3 whose purpose is to train the student to conduct pharmaceutical research and make progress towards a thesis, which will need to be completed by the end of the 3 course sequence. This will include all aspects of the research process, proposing a project, developing a research plan and experimental procedures, conducting experiments, analyzing and interpreting data and recording in a scientific notebook. The class is conducted through meeting with your advisor and in the laboratories.

Offered: Spring Only

**PHRSC 620 - Seminar & Journal Club 4 (1 cr.)**

This is the final course in a series of courses whose purpose is to train the student in the skills of critically reviewing published reports and presented reports. Students will defend their final research thesis. Further all students are required to participate by critically evaluating and presenting at least one current published paper, asking relevant and informed questions of presenters, and writing critiques on student

presentations. The goals are to train students to critically evaluate the scientific literature and provide students with the experience of making oral presentations on diverse topics.

Offered: Spring Only

### **PHRSC 628 - Thesis Research 3 (2 cr.)**

This is the third course in a series of 3 whose purpose is to train the student to conduct pharmaceutical research and make progress towards a thesis, which will need to be completed by the end of the 3 course sequence. This will include all aspects of the research process, proposing a project, developing a research plan and experimental procedures, conducting experiments, analyzing and interpreting data and recording in a scientific notebook. The class is conducted through meeting with your advisor and in the laboratories.

Offered: Spring Only

### **PHRSC 690 - Special Topics in Pharmaceutical Science (1-3 cr)**

Prerequisite: Enrollment in 2nd year of MSPS, or other Pharmacy Master's program.

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

Offered: Fall Only

### **PHRSC 691 - Special Topics in Pharmaceutical Science (1-3 cr)**

Prerequisite: Enrollment in 2nd year of MSPS, or other Pharmacy Master's program.

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

Offered: Fall Only

### **PHRSC 692 - Special Topics in Pharmaceutical Science (1-3 cr)**

Prerequisite: Enrollment in 2nd year of MSPS, or other Pharmacy Master's program.

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

Offered: Fall Only

### **PHRSC 693 - Special Topics in Pharmaceutical Science (1-3 cr)**

Prerequisite: Enrollment in 2nd year of MSPS, or other Pharmacy Master's program.

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

Offered: Fall Only

### **PHRSC 694 - Special Topics in Pharmaceutical Science (1-3 cr)**

Prerequisite: Enrollment in 2nd year of MSPS, or other Pharmacy Master's program.

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

Offered: Fall Only

### **PHRSC 695 - Special Topics in Pharmaceutical Science (1-3 cr)**

Prerequisite: Enrollment in 2nd year of MSPS, or other Pharmacy Master's program.

This is a study of an advanced topic of pharmacy, but not offered on a regular basis.

Offered: Fall Only

## **PSY - PSYCHOLOGY**

### **PSY 501 - Principles of Behavior Analysis (3 cr.)**

This course will orient students to the concepts, processes, and scientific principles of behavior on which the field of applied behavior analysis was founded. Topics of study will include the history and defining features of applied behavior analysis as well as the role of basic principles in producing socially meaningful behavior change (positive and negative reinforcement, punishment, discriminative control of behavior, and motivating operations).

### **PSY 502 - Behavioral Assessment (3 cr.)**

This course will provide an introduction to key concepts, methods, and ethical considerations associated with behavioral assessment. Course objectives will include teaching students to distinguish between idiographic and norm-referenced assessment approaches, to conduct pertinent behavioral assessments (preference assessments, functional assessments, and skills assessments), and to incorporate assessment outcomes with treatment selection and design in accordance with contemporary best practices in the field of applied behavior analysis.

### **PSY 503 - Behavioral Interventions (3 cr.)**

This course will prepare students to identify, implement, and maintain effective behavioral interventions in applied settings. Specific objectives will include teaching students to select and implement function-based interventions for the reduction of problem behaviors, skills-based prevention strategies, and a variety of behavioral teaching tactics. Tactics for promoting procedural integrity and facilitating the generalization and maintenance of treatment effects will also be reviewed.

### **PSY 504 - Autism and Related Disabilities (3 cr.)**

Prerequisite: Graduate standing

The purpose of this course is to provide students with a foundation in etiological, diagnostic, ethical, and treatment-related considerations affecting services for individuals with autism and other disabilities. Topics of study will include current data on causal variables, issues in early identification, and a survey of evidence-based models of treatment, outcome evaluation, and effective systems support for individuals with pervasive developmental disabilities.

### **PSY 505 - Methods of Evaluation (3 cr.)**

This course will equip students with skills needed to confirm the clinical efficacy of interventions by subjecting them to experimental evaluation using single-subject designs. Students will learn to develop valid and reliable systems for measuring behavior, to display data using popular and accessible graphing software, and to assess for orderly changes in behavior through visual inspection and interpretation of graphic data.

**PSY 506 - Evidence-based Teaching (3 cr.)**

This course will provide students with a comprehensive review of empirically-supported behavioral teaching procedures for individuals with autism and related disabilities. Topics will focus on teaching skills in a variety of content areas such as language, social, and self-help. Procedures for teaching these include, match-to-sample discrimination training, task analysis, as well as prompting procedures including prompt fading and video modeling.

**PSY 507 - Theoretical Foundations (3 cr.)**

This course will provide students with a comprehensive review of the theoretical foundations of radical behaviorism and the history of behaviorism in psychology. The primary focus will be to outline the fundamental underpinnings of science of the individual. Students will be exposed to Skinner's theoretical writings, which will be compared and contrasted with contemporary conceptualizations of complex human behavior.

**PSY 508 - Verbal Behavior (3 cr.)**

This course will expose students to the basis for a functional analysis of human language with an emphasis on application. Topics will include the elementary verbal operants, the ways in which verbal behavior is established, the relevance of the behavior of the listener, and the organization of verbal behavior. Focus will be placed on the use of an analysis of verbal behavior in addressing socially significant problems.

**PSY 509 - Ethics and Professional Issues (3 cr.)**

Prerequisite: Graduate standing.

This course will orient students to the ethical and professional guidelines for Board Certified Behavior Analysts. The course will review ethical guidelines for assessment, treatment, and research. Students will learn to describe and apply professional and ethical guidelines specifying the Behavior Analysts' responsibility to their clients, colleagues, and field and to society.

**PSY 510 - Thesis Research (3 cr.)**

This course will provide the structure for conducting, writing, and presenting thesis research. Students will meet individually with the thesis advisor and will attend a general research meeting at least monthly. Formal presentation and discussion of the dissertation research will take place during these research meetings.

**PSY 511 - ABA Practicum I (2 cr.)**

Prerequisite: Graduate standing

This practicum will involve at least 10 hours per week of work in a supervised clinical practice, educational, or research setting in which procedures based on behavior-analytic principles are implemented. Students will be supervised by a Board Certified Behavior Analyst, and supervision will consist of bi-weekly observations and weekly 1:1 or group meetings consisting of review of clinical cases, discussion of practice-related topics, and performance feedback.

**PSY 512 - ABA Practicum II (2 cr.)**

Prerequisite: Graduate standing

This practicum will involve at least 10 hours per week of work in a supervised clinical practice, educational, or research setting in which procedures based on behavior-analytic principles are implemented. Students will be supervised by a Board Certified Behavior Analyst,

and supervision will consist of bi-weekly observations and weekly 1:1 or group meetings consisting of review of clinical cases, discussion of practice-related topics, and performance feedback.

**PSY 513 - ABA Practicum III (2 cr.)**

Prerequisite: Graduate standing

This practicum will involve at least 10 hours per week of work in a supervised clinical practice, educational, or research setting in which procedures based on behavior-analytic principles are implemented. Students will be supervised by a Board Certified Behavior Analyst, and supervision will consist of bi-weekly observations and weekly 1:1 or group meetings consisting of review of clinical cases, discussion of practice-related topics, and performance feedback.

**PSY 514 - ABA Practicum IV (2 cr.)**

Prerequisite: Graduate standing

This practicum will involve at least 10 hours per week of work in a supervised clinical practice, educational, or research setting in which procedures based on behavior-analytic principles are implemented. Students will be supervised by a Board Certified Behavior Analyst, and supervision will consist of bi-weekly observations and weekly 1:1 or group meetings consisting of review of clinical cases, discussion of practice-related topics, and performance feedback.

**PSY 515 - Personnel Management and Supervision (3 cr.)**

Prerequisite: Graduate standing

This course will prepare students to conduct behavior-analytic supervision. Students will learn to establish clear performance expectations, select goals based on an assessment of the supervisee's skills, develop function-based strategies for improving performance, and design empirically supported staff training procedures. Students will learn to develop performance monitoring, feedback, and reinforcement systems and to evaluate the effects of supervision.

**PSY 519-528 - Supervised Practicum in ABA (1 cr.)**

This practicum will involve at least 10 hours per week of work in a supervised clinical practice, educational, or research setting in which procedures based on behavior-analytic principles are implemented. Students will be supervised by a Board Certified Behavior Analyst and supervision will consist of bi-weekly observations and weekly 1:1 or group meetings consisting of review of clinical cases, discussion of practice-related topics, and performance feedback.

repeatable 8 times

**PSY 529 - Thesis Research Continuation (1 cr.)**

Prerequisite: Graduate standing.

This course will provide the structure for conducting, writing, and presenting thesis research. Students will meet individually with the thesis advisor and will attend a general research meeting at least monthly. Formal presentation and discussion of the dissertation research will take place during these research meetings. This course is for students who have not completed the thesis requirement prior to earning 36 credits in the program.

**PSY 560 - BACB Exam Preparation (1 cr.)**

This course will review the BACB task list and knowledge areas and provide practice opportunities for the Behavior Analyst Certification Board (BACB) exam.

**PSY 590 - Special Topics in Applied Behavior Analysis (3 cr.)**

This seminar will conduct an in-depth review of a current topic in Applied Behavior Analysis. Topics may include but are not limited to: social development, behavioral pharmacology, ethical and professional issues, stimulus control, behavioral therapy.

**PSY 610 - Professional Issues, Ethics, and Research Design (3 cr.)**

Prerequisite: Acceptance into Ph.D. program.

This course will (a) introduce students to the expectations of students within the doctoral program at Western New England University, (b) bring students into contact with the values and rules of behavior analysis and psychology through primary and secondary source writings on ethics and professional issues (e.g., submitting or reviewing original research), (c) allow students to apply these value systems to their own clinical, educational, and research endeavors via class discussion, (d) review the institutional review board processes and human subjects research guidelines, and (e) review the logic and ethical application of single-subject and traditional group designs.

**PSY 620 - Experimental Analysis of Behavior (3 cr.)**

The course will provide the student with a thorough review of the development of the experimental analysis of behavior beginning with Watson and Skinner and continuing into the present. The focus will be on understanding the development of the field in elucidating general principles of behavior (e.g., reinforcement, extinction, shaping, respondent-operant interactions, discrimination, generalization, punishment and aversive control, etc.), paying particular attention to experimental and applied interactions.

**PSY 630 - Descriptive and Inferential Statistics (3 cr.)**

Prerequisite: Acceptance into Ph.D. program.

This course will focus on interpretation and application of descriptive and inferential statistical techniques required for an understanding of data presentations in psychological research. The primary focus will include measures of central tendency and variability, frequency distributions and graphical presentations, the normal curve, probability theory, hypothesis testing, the t-test, analysis of variance (ANOVA), multivariate analysis of variance (MANOVA), multiple regression, and correlation.

**PSY 640 - Quantitative Analysis of Behavior (3 cr.)**

Prerequisite: PSY 630.

The course will provide an introduction to the use of quantitative analysis in behavior analytic research and clinical practice. Topics will include statistical inference in behavior analysis; visual vs. statistical analysis; hypothesis testing; effect size, power, and non parametric tests; and quantitative models of common behavioral phenomena. (e.g., choice, matching law, molar vs. molecular analyses).

**PSY 650 - The Philosophy of Behaviorism (3 cr.)**

Prerequisite: PSY 620.

Behaviorism is the philosophy of the scientific approach to the study of behavior, including verbal behavior and private events. The approach holds that all behavior is a function of the interactions of ontogenetic and phylogenic variables rather than hypothetical structures. This course focuses on the philosophies of

methodological, radical, and cognitive behaviorism. The primary focus is on B.F. Skinner, his conceptual works, and his major critics.

**PSY 705 - Early Intensive Behavioral Intervention (3 cr.)**

Prerequisite: Acceptance into Ph.D. program.

This course will focus on current research and practice in early intensive behavioral intervention (EIBI) for autism and related disorders. Best practices and evidence-based approaches will be identified and reviewed. Attention will also be paid to effective preschool design, home-based intervention for common pediatric problems, and factors influencing successful inclusion of children with disabilities in typical classrooms.

**PSY 720 - Assessment of Severe Behavior Disorders (3 cr.)**

Prerequisite: Acceptance into Ph.D. program.

A brief overview of each of the three functional assessment methods currently in use will be covered (indirect or anecdotal methods, descriptive analysis, and functional analysis). After reviewing the defining characteristics, major procedural variations, strengths and weaknesses of each approach, the course will examine current research involving modifications and extensions of current functional analysis methodology and function-based interventions.

**PSY 735 - Organizational Behavior Management (3 cr.)**

Prerequisite: Acceptance into Ph.D. program.

This course examines individual human behavior in organizations. The objective of this course is to teach students how to analyze organizational behavior and performance improvement techniques from a behavioral perspective; as well as to learn about common Organizational Behavior Management (OBM) and Performance Management techniques to improve performance in organizations. Topics include: the history of OBM, performance appraisal, performance diagnosis (measurement and assessment), behavioral systems analysis/metacontingency analysis, feedback, goal setting, rewards and monetary incentives, and the relationship between job satisfaction and performance.

**PSY 740 - Developmental Psychology (3 cr.)**

Prerequisite: Acceptance into Ph.D. program.

This course will survey the history, philosophies, and theories of typical and atypical development with particular emphasis on early-childhood through young adulthood. The role of organismic and environmental variables in the development of motor, perceptual, social, emotional, and cognitive behavior will be-examined. The relation between development and education will also be covered.

**PSY 750 - Advanced Verbal Behavior (3 cr.)**

Prerequisite: PSY 620.

This course will review the conceptual and empirical foundations of a functional-analytic approach to human language and cognition. This approach represents the underpinnings of a scientific analysis of language. Research on the elementary verbal relations, generative language, symbolic behavior, grammar and syntax, as well as applied research on language training will be discussed.

**PSY 770 - Teaching in the College Environment (3 cr.)**

Prerequisite: Acceptance into Ph.D. program.

This course will focus on practical issues and methods for teaching in the college environment. It will focus on selection and use of teaching materials; course structure and development of instructional sequences; the role of lecture, discussion, and active participation; student evaluation and grading practices; and student motivation.

### **PSY 780 - Brain and Behavior (3 cr.)**

The focus of the course is the relationship between nervous system function and behavior function. The course will cover cellular function and neurotransmission, organization of the vertebrate nervous system, the generation and organization of adaptive networks, and the neurobiology of motor systems and action generation. Emphasis is given to the neurocircuitry serving learning processes, motivation, and emotion as a point of basic research interest and as it relates to human clinical disease and dysfunction.

### **PSY 790 - Special Topics in Behavior Analysis (3 cr.)**

Prerequisite: PSY 620.

This seminar will conduct an in-depth review of a current topic in applied or experimental analysis of behavior. Topics may include: social skills and play behavior, joint attention, behavioral pharmacology, stimulus control and stimulus equivalence, relational frame theory, behavioral counseling, or behavioral medicine.

### **PSY 801-809 - Behavior Analysis Practica (1 cr.)**

This supervised practicum experience will involve at least 20 hours per week of field work in a supervised clinical practice, educational, or research setting in which procedures based on behavior-analytic principles are being implemented.

### **PSY 851-856 - Dissertation Research (3 cr.)**

Prerequisite: PSY 610.

This course will provide the structure for designing, conducting, writing, and presenting dissertation research. Students will meet individually with the dissertation advisor and will attend a general research meeting at least monthly. Formal presentation and discussion of the dissertation research will take place during these research meetings.

repeatable 8 times

### **PSY 857 - 880 - Dissertation Research Continuance (1 cr.)**

Prerequisite: PSY 610

This course will provide the structure for designing, conducting, writing, and presenting dissertation research. Students will meet individually with the dissertation advisor and will attend a general research meeting at least monthly. Formal presentation and discussion of the dissertation research will take place during these research meetings. This course is for students who have not completed the dissertation requirement prior to earning 54 course credits in the program.

## **SPMN - SPORT MANAGEMENT**

### **SPMN 631 - Sport Leadership and Maximizing Team Performance (3 cr.)**

Prerequisite: Graduate Standing.

Corequisite: Residency Required.

This course provides an opportunity to examine leadership issues from multiple perspectives: sport, historical, sociological, psychological, and business management. Readings from these domains supply material to assess a range of leadership qualities and abilities. Students take the Klein Group Instrument for Effective Leadership and Participation in Teams (KGI)<sup>TM</sup> and the Myers-Briggs Type Indicator (MBTI)® to help them determine their own leadership styles and to guide them in refining their skills during the semester. Participants are assigned to a specific small group to perform an array of activities that serve as a context for personal skill building. They learn to analyze a variety of leadership functions and develop a reflective practice that enables them to continue to perfect their leadership skills in the future. Students also learn how to utilize the two assessments to train others in leadership and group skills. They learn a system of coaching and training techniques that will nurture leadership development in sport contexts. Students will be assessed based on several papers related to KGI/MBTI skill building, tests on key concepts, short reaction papers, and participation in small-group presentations.

### **SPMN 632 - Sport Analytics and Data Driven Decision Making (3 cr.)**

Prerequisite: Graduate Standing

Analytics are the present and future of sports, on and off the field. The sports industry is an analytics pioneer and data driven decision-making has become essential to successful sport business and team operation. This course focuses on developing and designing analytics strategy for both team personnel and sport business administration components of the sport organization. Students will learn about the application of analytics in sports for purposes of in-game strategy, player performance, team management, sports business planning, problem-solving and decision-making. The class will emphasize the value and role of analytics in leading the sport organization and best practices of data development, management and manipulation. Implementation of analytics programs across the organization will be explored as well as the role of analytics in effective sport leadership and organization management.

### **SPMN 633 - Compliance and Governance of Sport and Athletic Organizations (3 cr.)**

Prerequisite: Graduate Standing

This course will examine the various sport governing and regulatory agencies that influence the sport organizations. The course will focus on identifying and examining laws, rules and regulations of each sport's governing body as well as current issues and future trends for each governing agency. Governance of intercollegiate and scholastic athletics and professional sport, including legislation and bylaws associated with the NCAA, governing bodies and Commissioner's Office will be emphasized. The course will also examine the compliance function within the sport organization. The connection between external and internal governance and policy will be examined within the context of organizational leadership and operations.

### **SPMN 634 - Sport Agency, Player Personnel Evaluation and Management (3 cr.)**

Prerequisite: Graduate Standing

This course is designed to provide students with techniques related to player evaluation and amateur and professional sport. The course will focus specifically on the scouting and recruitment of amateur and professional athletes grounded in both qualitative and quantitative methods including basic observational, sport science, and analytics



metrics. Students will gain hands-on experience in player evaluation while examining important historical and economic issues related to player recruitment and evaluation. Contemporary issues in scouting, organizational design, team construction, athlete representation and agency will be covered. Students will also examine important issues in sport labor relations, collective bargaining agreements, NCAA regulations, and player agreements and contracts.

**SPMN 635 - Resource Development and Program Promotion for Sport and Athletic Organizations (3 cr.)**

Prerequisite: Graduate Standing.

Corequisite: Residency Required.

This course will explore theoretical and practical models of revenue development for the sport organization. Strategies for the creation and management of a successful athletic development program will be examined. Revenue development has become a critical competency for sport organization leaders and program managers. The course will also identify and examine opportunities for developing revenue for the sport organization ranging from broadcast rights, corporate partnership, licensing and merchandise programs. Topics will include strategies and programs critical to athletic development including annual giving, booster clubs, donor communications, event fund raising, stakeholder relations, and revenue program control and evaluation.

**SPMN 681 - Athletic Focus Profession Issues and Research Project (3 cr.)**

Prerequisite: Graduate Standing

This course introduces students to the sport research process. The course provides students with a framework for conducting research within the sport organization while reviewing based constructs such as techniques and tools for applied research such as sampling, research design, data collection, and analysis. As part of the course, students will engage in a research project linked specifically to a focused professional issue faced by the sport organization where they are completing their mentored field experience.

**SPMN 682 - Coaching/Athletic Administration Mentored Field Experience (3 cr.)**

Prerequisite: SPMN 631

This course is designed to provide students with the opportunity to apply theories and best practices in sport organization leadership introduced in the curriculum to a professional setting. The student is expected to engage in significant managerial and or operational activities where the effective leadership of a team is required. The student will be partnered with a faculty mentor who will work closely with the student and the field experience site supervisor to develop functional organizational skills while implementing their own personal leadership development plan.

## STUDENT SERVICES

### Undergraduate Student Services and Information

#### Student Assistance

**Delbridge Career Center** (p. 425)

#### Counseling Services

#### Enrollment Services

**Student Accessibility Services** (p. 425)

*Kevin S. and Sandra E. Delbridge Career Center*

The Delbridge Career Center, located on the second floor of the St. Germain Campus Center, offers a variety of career-related programs, workshops, seminars and classroom presentations to educate students on career development, readiness, and strategy. Specialized career professionals for the Colleges of Arts and Sciences, Business, and Engineering implement the University's strong commitment to the development of students' career decision-making by providing individual and group career advising; assistance in major and occupational exploration; and internship, job and graduate school search strategies. Students who have not officially declared majors are encouraged to utilize the services of the career advisors who, through assessment inventories and exploration tools, will assist students in declaring a major.

A four-year career plan is offered by the Delbridge Career Center to direct students at each level of their University education, with the emphasis shifting from academic to professional. Career education and exploration begins in the students' first year where students begin to discover and understand their skills and strengths, and participate in University experiential activities. In the students' sophomore year, they begin to direct their interests through a variety of courses, further develop leadership skills, and participate in career-focused programs such as Sophomore Career Connections. The University's internship program adds value to students' education by bringing the theories and concepts learned in the classroom to life and providing opportunities to apply that knowledge in local businesses and organizations. Through the combination of academics and experiential learning, students develop the career readiness skills and experiences employers and graduate schools require of their candidates.

The Delbridge Career Center collaborates with other departments on campus, including University Advising, Residential Life, Athletics, Alumni Relations, Student Involvement and Leadership, the Office of First Year Students & Students in Transition, and academic departments to facilitate workshops and activities. Topics include interviewing, résumé and cover letter building, options for exploring internships and study abroad, and networking to educate and empower students. The campus recruiting program connects students to employers through information sessions, interview days, and virtual and on-campus career fairs. Central to these programs and to student success is networking. As such, the career professionals work in partnership with students to identify, strategize, and expand their own network of career resources.

All students have access to Handshake, the Delbridge Career Center's robust, interactive career management system. In Handshake, students create their profile; research and apply for jobs and internships; connect with employers; participate in career fairs, events, and workshops; make appointments to meet with their Career Advisor; and store career documents (résumés, cover letters, etc.) and other career resources. Access to Handshake continues after graduation as alumni of the University.

Resources including web-based career guidance programs such as TYPEFOCUS, Candid Career, O\*NET and other internet sites provide students with the knowledge to make informed career decisions. The University's network of alumni is a valuable resource to connect students with alumni actively employed in their fields and eager to share their occupational information.

The Delbridge Career Center's effective combination of education, career programs, and job search coaching is a valuable complement to every student's academic experience.

#### *Counseling Services*

**Counseling Services.** Caring, licensed professionals provide confidential help to students with personal, social, and educational concerns. Common areas of concerns include adjustment to college, anxiety, depression, relationships, sexual identity, eating disorders, substance abuse, sexual/physical abuse, and test anxiety. Services include individual, couple, and family counseling, as well as crisis intervention. We can provide a list of off-campus therapists when requested.

Check out the website where students can take a self-help screening for depression, anxiety, substance abuse, eating disorders, PTSD, or bi-polar disorder. Students will also find more information about our staff, commonly asked questions, and WNE's Alcohol and Drug Education Services.

To make an appointment, come to the Counseling Center in person, or call 413-782-1221 during office hours, Monday through Friday, 8:30 a.m. to 4:30 p.m. The Counseling Center is located in the St. Germain Campus Center, Room 249.

**Disclaimer:** Although Counseling Services' professional staff can address many mental health concerns, there are some disorders that are beyond our scope of practice. Examples include, but are not limited to, psychosis, severe addictions, and severe eating disorders. In these instances students will be provided with appropriate off-campus referrals.

Additionally, given the number of students that seek counseling, most appointments will be made on an every-other-week basis. During times of high demand students may be placed on a waiting list with no guarantee they will be able to be seen before the end of the semester. Students who are experiencing a mental health **crisis** will be seen that day.

#### *Student Accessibility Services*

Western New England University and Student Accessibility Services (SAS) is committed to providing services that will support students with diagnosed disabilities. Both section 504 of the Rehabilitation Act and the Americans with Disabilities Act Amendments Act (ADAAA) guide the accommodation process at WNE. In collaboration with students, families, faculty, and staff, SAS approves accommodations for students with documented needs. Additionally, some examples of accommodations provided to students include extended time on exams, a distraction-reduced testing environment, use of assistive technologies, and accessible housing. University students seeking SAS services will need to self-identify and register with SAS by completing the SAS Intake form, providing supporting documentation that substantiates a disability and subsequently participating in a Welcome Meeting. Documentation is required from all students who request services, and it must demonstrate that the student's disability substantially limits one or more major life activities in accordance with ADAAA. For specific documentation

criteria and to access the online registration process, please visit: <https://www1.wne.edu/student-accessibility-services/index.cfm>

Accommodations are individually determined based on the functional limitation(s) that are identified by the diagnostic evaluation and through an interactive process. Once registered with SAS, it is the responsibility of the student to request accommodations on a semester-to-semester basis or as the need arises. Students are strongly encouraged to notify SAS of their accommodation needs with as much advanced notice as possible to ensure timely implementation. Accommodations are not set up automatically or applied retroactively. Student information is kept confidential and shared only on an as needed basis.

For more information visit <https://www1.wne.edu/student-accessibility-services/index.cfm>

### Student Employment

Western New England University's Student Employment program can help students meet their educational and personal expenses. More than 50% of our undergraduates work on-campus in a variety of positions. Through student employment students have the opportunity to contribute to the Western New England community while learning and practicing skills for future positions and internships.

#### *Getting a Job*

Open positions are posted on the Cornerstone Student Career Site <https://wne.csod.com/ats/careersite/search.aspx?site=4&c=wne> after August 1. Students are encouraged to apply to several positions and actively follow up about the status of their application with hiring supervisors.

The office of Human Resources, located in Rivers Memorial Building, administers the On-campus Student Employment program and is available to assist students in their job search should they need their expertise

#### *Student Employment–Federal Work Study*

The Federal Work Study Program provides funds for jobs for undergraduate students with financial need. The program encourages community service work and work related to the student's course of study. The Federal Work Study Program is need-based and requires a completed financial aid application on file with the University. Most Federal Work Study positions are on campus however, there are some off campus opportunities with America Reads.

#### *Student Employment–Institutional*

For students not receiving a Federal Work Study award, some University offices have institutional positions available. These positions are not tied to financial aid awards and are on-campus positions only.

Note: On-campus private vendors such as ARAMARK and Follett hire independently and not through this program.

#### *Student Employment Job Fair*

The Student Employment Job Fair is held annually and is scheduled within the first two weeks of the fall semester. Representatives from a variety of University offices and departments attend to recruit student employees. Students will have an opportunity to speak with potential supervisors about specific job responsibilities.

## Residence/Campus Life

### Living Facilities

Students may live in a variety of accommodations, ranging from traditional residence halls to room suites with semiprivate baths, and apartments or townhouse units with full kitchens and baths. Residence facilities serve as an integral part of the educational program. Students proceed through various types of residential facilities as they progress through their undergraduate programs. First-year students are normally assigned to traditional residence halls, while sophomores, juniors, and seniors become eligible to reside in suite-style living units, apartments, or townhouse units, as space permits.

All residence facilities are furnished with bunk or loft style beds, storage space (such as closets, free standing wardrobe units, or bureaus), desks, and chairs. Apartment and townhouse units are also furnished with kitchen appliances, a dining table, and living area furnishings. Laundry on campus is included with your housing charge and does not require any additional payment. Assignment is determined by the student's housing preferences, class level, and number of credits. Requests for University housing are honored depending on availability of facilities, fulfillment of application, payment, and assignment deadlines. Each residency area is staffed with an Area Director and several Resident Advisors. The Area Director is a full-time professional, live-in staff member who oversees components of University housing throughout the campus. Resident Advisors are full-time undergraduate and graduate students working directly with a specific living group.

### Dining Services

Food services are provided in the University Commons. A full service board plan offers students a variety of dining options. All first year resident students participate in the University's 7 Day All Access meal plan. Students have unlimited access to the dining hall every day while it is open. Upperclass resident students residing in Commonwealth Hall, LaRiviere, and Windham Hall may elect to participate in the 7 Day All Access Plan or the Weekly 12 Meal Plan. Students living in Gateway Village, Evergreen Village, and Southwood Hall, as well as commuter students, have the option of adding a dining plan. In addition to the standard dining plans, students may also purchase "Bear Bucks," which function like a debit card and may be used at any dining location on campus, as well as at Domino's Pizza. Food service is available seven days a week while classes are in session.

Food Service professionals are available to assist with dietary concerns such as food allergies. Detailed documentation from a physician outlining specific food restrictions and/or needs should be provided to the Office of Student Accessibility Services for consideration of an accommodation or exemption status.

### Health Services

#### Health Services

Health Services is a comprehensive healthcare facility located in the Center for Sciences and Pharmacy, suite 235. The department is staffed with board certified health care providers.

Health care is available Monday through Friday from 8:30 a.m. to 4:30 p.m., by appointment. Please call to schedule care. For urgent medical advice, after hours an on-call provider is available. \*For life threatening emergencies contact Campus Police or dial 911.

Prior to the start of classes, all full-time students are required to submit an admission health form.

This form is located on the Health Services website. This form includes a medical history, recent physical examination, and documentation of all required immunizations. Attendance for classes is contingent upon submission of a completed health form. Of note, NCAA athletes must meet additional health requirements.

Health Services does not charge a co-payment for care. Medical care is, however, billed to insurance. Students are responsible for all financial obligations incurred for medical services these include laboratory fees, radiology charges, prescription medications, and visits to off-campus health care providers.

The Commonwealth of Massachusetts requires that undergraduates taking 9 credits or greater or full-time graduate students must either purchase insurance through the University or complete a waiver form online with pertinent information about their private insurer. This process must be completed *every year* of enrollment.

For additional information, please visit our Health Services website and/or contact our office.

### Student Involvement and Leadership

The mission of the Office of Student Involvement and Leadership (SIL) is Explore. Connect. Engage. Lead. We work with students as they explore new ideas and interests, their identity, the arts, cultures, and opportunities at Western New England. We foster ways for them to connect to the community, their peers, networks of support, clubs and organizations, and their goals. We encourage engagement in learning outside of the classroom, leadership development, program planning, community service, and social action, with the goal that our students will lead through involvement in clubs and organizations, employment, activism, peer engagement, and in their communities.

Student Involvement and Leadership provides all students with opportunities to explore from the moment they step foot on campus, with the goal of connecting them to their peers, community, and learning outside of the classroom. We are committed to ensuring that students take advantage of pathways, or create their own path, to become engaged members of the community and leaders in their cocurricular involvement.

The pillars of SIL are:

- Clubs and Organizations
- Leadership
- Programming
- Campus Center Community
- Civic Engagement

### Clubs and Organizations

**Clubs and organizations** represent a wide range of programs and reflect the current interests of our students. Involvement in clubs fosters personal growth and the development of many transferable skills for future career paths. Club activities include social programs, career exposure, and community service projects. All students are encouraged to actively participate in at least one organization and to regularly attend the many activities offered on- and off- campus.

With over 70 clubs and organizations to choose from, the challenge is not "will I get involved?" but rather "how do I narrow down the choices?" Involvement opportunities range from off-campus trips sponsored by the Outing Club, to the exciting array of video game tournaments sponsored by the gaming club (WARP). Most of the academic departments have a partnership with a student organization and provide collaborative opportunities between academic and cocurricular life. The Class Councils sponsor campus-wide entertainment that ignites class pride.

The Student Senate is the official voice of full-time undergraduate students and is comprised of representatives from each class; representatives from each of the Colleges of Arts and Sciences, Business, and Engineering; and commuter and resident representatives. Elections for most offices are held in the fall and spring of each year. The Student Senate serves as a liaison between students, faculty, and the administration of the University. In addition, the Senate appoints representatives to sit on joint committees of the University Senate in order to encourage cooperation and to foster joint decision making. The Senate has as one of its major responsibilities the budgeting and administering of student activity fees in ways that will most benefit the University community, mostly through funding the 70+ clubs and organizations, class councils and major events such as Spring Event.

Clubs and organizations broken down into the following interest areas:

- Special Interest
- Class Councils
- Diversity, Equity, and Inclusion
- Professional and Departmental
- Bold Media
- The Arts

A full list of clubs and organizations can be found here.

### Campus Center

The **Campus Center** is the center of activity for students, faculty, staff, and guests of Western New England University. Centrally located on our beautiful campus, the Campus Center is easily

accessible from any point on campus. It is the home of the University Bookstore, a Game Room with two billiards tables, ping pong and air hockey tables and arcade games, meeting rooms of various sizes, programming spaces, the Golden Bear Clubs and Organizations Resource Center, as well as most offices within the Division of Student Affairs.

### *Community Engagement*

**Community engagement** on campus educates students to be socially conscious, skilled, and committed to a just, diverse and democratic community. While offering a wide range of community service programs, we provide students the opportunity to be civically engaged, explore the root causes of social issues, foster reciprocal relationships with community members, and gain cultural competence.

#### Multicultural Interests

#### **Office of Diversity Programs and Services**

Supporting the educational value gained through the array of cultures represented on our campus, the University acknowledges, recognizes, and strives to undergird the particular concerns of under-represented, marginalized, and international students. The University values and supports diversity, equity, and inclusion in its many forms as we recognize that students work, play, and live in a pluralistic society. Through programming, we offer students additional exposure to an increasingly complex and interconnected world, in ways that encourage respect for other cultures and people groups. Examples of current or past programs include celebrations of Black History, Latino History, International Cultures, and Women's History. Programming also includes exposure to visiting artists and lecturers of rich and culturally diverse heritages. The organization and execution of these programs are administered through the Office of Diversity Programs and Services solely or in collaboration with the multicultural club on campus called United & Mutually Equal (U&ME), and other clubs and offices who support the mission of diversity, equity, and inclusion.

#### First and Second Year Program

#### *Mission Statement*

The Office of First Year Students & Students in Transition pays particular attention to creating a network of support persons whose intention involves proactive interaction with students in transition. Whether entering college as a first year or transfer student, or moving on to the second year of study at the University, the Office of First Year Students & Students in Transition seeks to support students in laying the foundation for success as well as in further defining a sense of purpose and direction in order to maximize the university experience. As an agent of change, the Office of First Year Students & Students in Transition functions in a culture of collaboration with each of the undergraduate schools and academic departments, student affairs staff, faculty, student leadership, and alumni. It espouses a student-centered approach to program delivery. Students are always to be treated as the reason for any initiative.

Through intentional construction of a personal support network and sponsorship of educationally purposeful initiatives, the Office of First Year Students & Students in Transition prompts students to embrace

intellectual change, acquire a sense of place, engage social connections, and develop educational purpose. As students move into the second year, support exists to encourage students to define a sense of purpose and direction, challenging students to recognize valued learning in and out of the classroom, discarding any notion of mediocrity in performance, so that full academic and personal potential can be obtained.

The Office of First Year Students & Students in Transition values individuality and diversity. It acknowledges that students enter college at varying developmental stages and with unique needs. We are committed to fostering a highly personal and innovative delivery system in order to prompt students to identify a vision of their future, acquire the confidence to pursue that vision, set realistic goals, maintain motivation, and build academic and personal resiliency. We seek to move students from dependent to interdependent relationships. We emphasize interaction with faculty early in the student experience and characterize peers as highly influential.

#### *Goal of the First and Second Year Program*

The formula for success in the first phase of college appears simple: make friends, embrace the academic demands of college work, participate in activities, and seek out people who can help in times of need. The difference between a successful beginning and one which is less successful than anticipated can be related to something as simple as knowing when to get help or finding someone who will listen at times of distress. The program clarifies the simple tasks and attempts to make simple the more difficult tasks of college adjustment. The program challenges students to work to personal potential and to discard any notion of mediocrity.

#### *Program Objectives*

The First and Second Year program offers help in the following ways:

- Making students aware of services and resources
- Identifying and reforming a network of educational and emotional support
- Encouraging specific goals for academic, physical, and personal accomplishments
- Prompting involvement and participation in campus life
- Assisting in development of an educational plan and scheduling of classes
- Monitoring and encouraging academic progress and engagement
- Fostering awareness of the value of a college education
- Increasing student awareness of the responsibility of citizenship
- Building student confidence
- Clarifying career alternatives

#### *Programs and Services*

Programs are always changing to remain current with student needs. In its present form, the First and Second Year program is focused on several elements which are believed to have educational value and purpose and which foster student success. Equally crucial is student participation. One of the most important variables in success is a student's willingness to take advantage of the support system. Without participation, program or advisor interaction is of little value. The following programs are designed to promote a successful adjustment to college life:

#### 1. Summer Orientation and Registration (SOAR)

Students and parents take part in a two-day, overnight program on selected dates through the summer months. The SOAR program is

guided by principles of academic anticipation. During SOAR, students reside on campus. Separate but complementary programs are held for students and parents. Student and parent needs are addressed through the first class meeting of First Year Seminar, academic information sessions, adjustment workshops, conversations with faculty, completion of course registration for the fall semester, initiation of a preliminary educational plan, completion of residency assignment information, and introduction to college life. An alternative one day orientation program is available for transfer students.

## 2. Transitions Program

Moving from an environment that has been relatively predictable and consistent to one that is as of yet undefined requires both realistic expectations and development of a network of support. The Transitions Program has been developed with these goals in mind. The programs encompass both multiple social opportunities for students who make up the learning community to associate and traditional events. Most importantly, the Transitions Program also introduces students to the network of persons who stand to serve in a mentoring capacity.

## 3. First Year Seminar

All first semester first year students and transfer students with 29 or less completed college credits (AP or high school to college credit is not counted in the credit limits) are required to successfully complete a graded, credit bearing course focusing on critical thinking, discovery and confirmation of academic interests, oral presentation strategies, promotion of educational values, information literacy, and personal development. Many sections of the seminar also feature content relevant to a particular academic discipline. The seminar is taught by regular teaching faculty who also serve as students' academic advisors for the first two years of enrollment or until such time as a major is confirmed. Students may opt to request reassignment of the faculty advisor should the need arise. First Year Seminar is uniquely structured by each designated College. Credit values vary. Upper-class student assistance further distinguishes the course in the context of modeling and fostering academic integration.

## 4. Summer Reading Assignment

All first year students are assigned a selected reading for summer study in an effort to heighten awareness of college academic work and challenge students in critical thinking. Students are expected to begin the academic year fully prepared to discuss the summer reading assignment and to have completed the companion writing assignment. Reading and writing assignments are often linked to regular classes in English and First Year Seminar.

## 5. College Success Coaching

The College Success Coaching Experience (CSCE) is a semester-long series of interactive academic success skills presentations and one-on-one coaching sessions. During CSCE sessions, students will discover their strengths, learn how to apply those in the collegiate classroom, and build academic confidence through the learning and application of academic success skills. The CSCE class focuses on skills that are used in all content areas, including time management, organization, communication, study skills, and test-taking skills. Students learn how to and are given guidance in applying those skills to their first semester classes. Class sections have a 1:20 Academic Success Coach to student ratio. The Academic Success Coach will conduct the class and mentor students during individual coaching sessions.

## 6. Academic Progress Monitoring

There are two key indicators that serve to foster or inhibit academic success: class attendance and completion of out-of-class assignments. Both indicators are monitored through the first year. Regardless of any class attendance policy, it is well documented that students who

regularly attend all class meetings succeed; those who choose to skip class do not succeed. When excessive absence patterns are noted, students are typically advised of the potential impact on progress.

At completion of the sixth week of classes, and at the end of the eighth week grades are calculated based on assignments completed to date. In progress grades are distributed to first year students through the assigned advisor. Second year students access grades online. Instructors are also encouraged to both express congratulations to those who have met notable success and concern for those who may be struggling. Specific suggestions for improvement and/or reasons for congratulations are then shared with student advisors.

At the end of each semester, student academic performance is formally reviewed to ensure reasonable progress. If students are below minimum standards, a formally structured academic success contract is required. Through the Academic Success Center, academic progress monitoring is put in place through a series of meetings during which continuous assessment of progress is made.

## 7. Tutoring and Supplemental Instruction (SI)

It is quite normal for students to encounter subject matter which proves challenging. To support instruction, peer tutors are employed to assist students over the rough spots in mastering content and developing study strategies which match the type of course. Tutoring is typically offered on a short-term basis in many 100 and 200 level courses. Additionally, academic support is offered in certain high-risk courses through a program known as supplemental instruction. SI features organized study sessions coached through upper-class students who have previously taken the course.

## 8. Life Skills Study Mentoring

The Life Skills Study Mentoring program is a unique collaboration between the Department of Athletics and the Academic Success Center. It is based on the NCAA/CHAMPS Life Skills Program and strives to support student development and enhance the quality of the student-athlete experience. Life Skills Study Mentors monitor team-sponsored study halls and conduct life skills workshops on goal setting, time management, effective study skills, and other topics that will assist student-athletes in balancing their role on a collegiate varsity athletic team and in achieving academic success.

## 9. Freshman Focus Program

The freshman focus program serves as an umbrella under which students can access particular opportunities for personal growth. Programs include the Student Activities Expo designed to acquaint students with clubs and organizations, thereby seeking to connect students to the life of the campus. Freshman focus programs also include workshops geared to students who aspire to leadership as "emerging leaders." Students may also elect to take part in Freshman Council, an assembly of freshman students committed to building cohesiveness and respect for every first year student. Yet another dimension of the freshman focus program includes the development of student-centered community expectations, a set of guiding principles governing student living and interaction. Finally, the freshman focus program provides the structure for formation of a personal development lecture series revolving around themes of life management and social consciousness.

## 10. Celebrating Student Success

Student achievement is valued at Western New England University. Students can expect to hear from the Dean of First Year Students and Students in Transition or Academic Success Center not only when there is concern, but also when academic and personal goals have been met. Recognition is likewise noted through the freshman honor society, Alpha Lambda Delta. Eligibility is determined by grade point average at the end of the first semester of full-time enrollment or cumulatively at the end of the first year. Second year students are also eligible for election to the sophomore honor society.

## 11. Alumni Mentoring Initiative

During the first year, students often find that there is lingering lack of clarity over academic and career direction. Formed as an extended part of the First Year program, volunteer alumni from the College of Engineering have been recruited and coached to offer mentoring partnerships which extend the range of the web of support characteristic of the First Year program. Students are assigned an alumni mentor through the first year engineering seminar. Mentors and protégés are brought together in a collaborative program with the Office of Alumni Relations and the College of Engineering. Students are encouraged to take advantage of the mentoring relationship through a series of relationship “prompts,” activities designed around a career development theme through which alumni can provide perspective and advice.

### 12 Sophomore Career Connections Program

The Career Center, in collaboration with the Office of Alumni Relations, coordinates an exploratory program for our University sophomores. This opportunity introduces students to potential careers through interactive workshops and links the student to an alumnus or professional who is located in the Greater Springfield area and works in a field of interest to the student. Sophomore Career Connections provides students with the ability to build their professional network and gain valuable insight into their potential future career path.

### Support in the First Year Transition

An alumnus of Western New England University described the First Year program as a web of support. The alumnus was describing the many options students have to identify a personal resource and mentor. A critical piece to solving the adjustment puzzle is to identify at least one person in an advising capacity who is accessible and interested in student success. In the First Year program, such identification is made easier by searching among a carefully constructed support network. While the second year requires more overt and intentional outreach, mentoring is no less important.

#### 1. Faculty Advisor

Each student is assigned to a member of the faculty or professional staff to assist in the development of educational and career plans. Normally, the first year advisor is linked to the first year seminar instructor. Sophomores are typically linked to advisors based on academic discipline. Academic advisors are the principle resource regarding information on academic requirements and should be consulted prior to completion of course registration and to review in-progress grades.

#### 2. University Advisor

Each first year student is assigned to a professional staff member in the Vanech Family University Advising Center who provides students specific and holistic support through to graduation. This assignment never changes so the advisor remains a constant person of support as you work towards your completion date. The advisors assist with clarifying academic, life, and career goals that open conversation to determine major options that align with those goals. University Advisors are also a connection to appropriate campus resources while they help navigate the physical campus and technology/educational tools utilized on campus.

#### 3. Peer Advisor

Each first year student is assigned to an upper-class student who is trained to serve as a source of information, point of first contact, and conduit to program and services. Most notably, peer advisors coach each student in the formation of the personal success plan and act as an advocate for student success. Peer Advisors are also assigned to

each section of the First Year Seminar to work with seminar instructors and mentor students in the development of academic skills and attitudes. For transfers, Peer Advisors are trained to provide transfer students specific transitional support to match the unique experience of being a first year student at a new institution while having already navigated the high school to college transition.

#### 4. Faculty

Among the notable changes students encounter in college is the shift to assuming personal responsibility for learning. Faculty teaching in the first year and beyond are committed to student success and particularly respond to students who demonstrate a desire to learn. Students are encouraged to take advantage of faculty interest. Faculty further demonstrate their commitment to the quality of instruction in the first year through the existence of a faculty committee dedicated to the first year academic program and promotion of structured learning environments with high feedback.

#### 5. Resident Advisor

Students of sophomore, junior, or senior standing are employed by the Residence Life Office to assist in the day-to-day management of the residence areas, and the development of group living-learning environments conducive to academic achievement and personal growth.

#### 6. Supplemental Instruction Leader

Within the context of academic programs, there are historically high-risk courses. In a number of such courses, upper class students serve to model and foster effective strategies for becoming a student of the discipline.

For further information about the First Year program, visit <http://www1.wne.edu/first-year/index.cfm/>, or to solicit advice and counsel regarding educational or personal goals, students and parents are encouraged to contact the dean of First Year Students & Students in Transition.

### International Student and Scholar Services - ISSS

International Student and Scholar Services (ISSS) staff advises the University's international students, scholars, and their dependents from throughout the world on matters relating to immigration as well as academic, social, financial, and personal concerns relevant to daily life in the United States. ISSS also provides programs specifically to serve the needs of international students and scholars from immigration advising to cultural adjustment programs. ISSS programs include the International Welcome Reception, Diwali, International Week, the Kite Festival, and many more.

Additionally, ISSS collaborates with other campus offices and students organizations to develop and implement educational and co-curricular programs designed to heighten cultural awareness, appreciation of cultural diversity, and intercultural understanding for all students and scholars.

More information can be found at the ISSS website: <http://www1.wne.edu/international-students/index.cfm>

### Professional Societies

**American Marketing Association (AMA).** Western New England University is home to one of the 400 collegiate chapters of the American Marketing Association. The mission of the Collegiate Chapters Division of the AMA is to be the world's leading professional student organization by furthering the professional development of students through leadership, training, and involvement in the field of marketing.

**American Society of Mechanical Engineers (ASME).** The Western New England University student section of The American Society of Mechanical Engineers was established for the purpose of advancement and dissemination of knowledge of the theory and practice of mechanical engineering, the presentation of a proper perspective of engineering work, and the opportunity to become acquainted with the personnel and activities of the Society, as well as the promotion of professional awareness and fellowship.

**Association for Computing Machinery (ACM).** Organized as a student chapter, the Association for Computing Machinery seeks to promote a working knowledge of computer science. Design, construction, and language of modern computing machinery are within the interests of the club. Additional goals of the chapter are to promote professionalism and ethical use of computing and information resources. Affiliate membership is offered to any student and full membership is likewise available, provided the student is also a member of the national organization.

**Biomedical Engineering Society (BMES).** The Biomedical Engineering Society is a national organization of biomedical engineers. The mission of the student branch of the BMES at Western New England University is to provide students the opportunity to learn about the field of biomedical engineering. Through participation in the chapter, students are exposed to the many diverse aspects of the field as well as opportunities for education and employment after graduation. The chapter accomplishes this mission through invited guest speakers, plant and clinic tours, a trip to the Annual Meeting of the BMES, and a trip to the Annual Northeast Bioengineering Conference. Additionally, students are encouraged to submit papers into regional and national competitions sponsored by the BMES. Beyond these experiences, the chapter offers students opportunities for community involvement and social activity.

**Institute of Electrical and Electronic Engineers (IEEE).** The Institute of Electrical and Electronic Engineers is the world's largest professional engineering society. The Western New England University student branch provides the electrical engineering student with a means of establishing a sense of professional awareness and identity. It has proven itself to be valuable in helping students make important career decisions. It also provides students with a medium for entering student paper competitions at local, regional, and national levels. A strong tie exists between the local professional chapter and the student branch at the University.

**Institute of Industrial Engineers (IIE).** The objective of the Western New England University student chapter of the Institute of Industrial Engineers is to promote the profession of industrial engineering through affiliation with the national organization. Activities include discussion of professional opportunities; field trips to employment sites; research; and becoming acquainted with the ideals, purposes, and lifestyle typical of those in the profession. The student chapter brings the classroom experience to life.

**Society of Women Engineers (SWE).** The student chapter of the Society of Women Engineers was established to serve as a support group and provide career guidance to women engineering students. The student chapter of SWE sponsors panel discussions and lectures given by women engineers focusing on the special needs and problems of women engineers in industry. The students also attend seminars, mini-conferences, and meetings of the National Society of Women Engineers Hartford Section and Boston Section. The SWE chapter has also established a mentorship program with women engineers in local industry.

**Student Chapter of the Northeastern Section of the Mathematical Association of America.** The student chapter of the Northeastern Section of the Mathematical Association of America provides a forum for students to discuss and plan careers in mathematics and the

mathematical sciences; to present student papers at the local, regional, and national levels; and to participate in a national problem-solving contest. Moreover, students are encouraged to attend mathematics conferences, subscribe to journals through the MAA, and to participate in many of the activities during Math Awareness Week each year. The chapter is established to expose students to many areas in mathematics and to all the career options open to mathematicians. Membership is available to any student who is a member of the national organization.

#### Honor Societies

**Alpha Kappa Delta.** Alpha Kappa Delta is the national honor society in sociology and a member of the Association of College Honor Societies. The Theta Chapter of Massachusetts was chartered at Western New England University in 1975. Students are nominated for membership through their faculty advisor on the basis of academic excellence and serious commitment to, and interest in, the study of sociology for the purpose of service to mankind. To be nominated, a student must have a 2.7 cumulative average and a 3.0 average in at least 12 credit hours of sociology and social science course.

**Alpha Lambda Delta.** Alpha Lambda Delta is a national honor society that recognizes academic excellence during a student's first year in college. The purpose of this honor society is to encourage superior academic achievement among freshmen and to promote leadership early in the students' collegiate experience. Membership is open to all freshmen who earn a cumulative average of at least 3.5 either in their first semester of enrollment or in their first year of enrollment prior to initiation. No incompletes or failures can be on the record. To be eligible, students must be enrolled full-time in a degree program.

**Alpha Mu Alpha.** Alpha Mu Alpha is the national marketing honorary society for qualified undergraduate, graduate, and doctoral marketing students, and marketing faculty. Under the auspices of the AMA, a selected advisory committee of marketing educators designed the recognition program to acknowledge outstanding scholastic achievement on a highly competitive basis. Honor recipients must be senior undergraduate students with a minimum overall GPA of 3.25, members of the Western New England University Marketing Association, and members of our Collegiate Chapter of the American Marketing Association.

**Alpha Phi Sigma.** Alpha Phi Sigma is the only Criminal Justice Honor Society for Criminal Justice majors. Alpha Phi Sigma recognizes academic excellence; Students must maintain a minimum of 3.2 overall GPA and 3.2 GPA in criminal justice courses. The student must also rank in the top 35% of their classes and have completed a minimum of four courses within the criminal justice curriculum. The Honor Society is open to those with a declared criminal justice major or minor.

**Beta Alpha Psi.** Beta Alpha Psi is an honorary organization for Financial Information students and professionals. The primary objective of Beta Alpha Psi is to encourage and give recognition to scholastic and professional excellence in the business information field. This includes promoting the study and practice of accounting, finance, and information systems; providing opportunities for self-development, service, and association among members and practicing professionals; and encouraging a sense of ethical, social, and public responsibility. Our Mu Epsilon Chapter of Beta Alpha Psi was installed in January 2009.

**Beta Gamma Sigma.** Beta Gamma Sigma is a national honor society for business majors at schools accredited by AACSB International, the Association to Advance Collegiate Schools of Business. Students are selected from the top 7% of juniors, top 10% of seniors, and top 20% of graduate students. Candidates must have



completed at least one half of the work required for their degree, and have completed two terms' work at Western New England University.

**Lambda Pi Eta.** Lambda Pi Eta is the official communication studies honor society of the National Communication Association (NCA). As an accredited member of the Association of College Honor Societies (ACHS), Lambda Pi Eta has nearly 400 active chapters at colleges and universities worldwide. The goals of Lambda Pi Eta are to recognize, foster, and reward outstanding scholastic achievement; stimulate interest in the field of communication; promote and encourage professional development among communication majors; provide an opportunity to discuss and exchange ideas about the field; establish and maintain close relationships and understanding between faculty and students; and explore options for further graduate studies.

**Mortar Board.** The Mortar Board is the senior honor society at Western New England University. The society is open to those students who have demonstrated both academic excellence and leadership both on campus and in the community. Students in the top 35% of the Junior Class will be considered eligible for the Society with the membership being selected by the existing members of the previous year. The Mortar Board Society hopes to recognize student achievement, while also serving as a focal point of planning and collaboration for senior leaders.

**Omicron Delta Kappa.** Omicron Delta Kappa (ODK), the National Leadership Honor Society, was founded in 1914 at Washington & Lee University in Lexington, VA. The founders formulated the idea that leadership of exceptional quality and versatility in college should be recognized; that representatives in all phases of college life should cooperate in worthwhile endeavors; and that outstanding students, faculty, and administrators should meet on a basis of mutual interest, understanding, and helpfulness. ODK was the first college honor society of a national scope to extend recognition beyond the formal classroom and give recognition and honor for meritorious leadership and service in extracurricular activities and to encourage development of general campus citizenship. Chapters, which are called Circles, are located on over 300 campuses throughout the nation. The Circle of ODK at Western New England University recognizes achievement in the following five areas:

- Scholarship
- Athletics
- Campus/Community Service, Social/ Religious Activities, and Campus Government
- Journalism, Speech, and the Mass Media
- Creative and Performing Arts

Nominations are taken each fall and spring from all segments of the campus community.

**Phi Alpha Theta.** Phi Alpha Theta is the national honor society in history. Its mission is to promote the study of history through the exchange of ideas and the encouragement of research, teaching, and publication. To be considered for membership, a student must have completed at least 12 hours in history (four courses), have a GPA of at least 3.1 in history, have a GPA of at least 3.0 overall, and be in the top 35 percent of the entire class. Membership is not limited to history majors.

**Pi Sigma Alpha.** Pi Sigma Alpha is the national political science honor society. Students majoring in political science, public administration, and international relations who attain high standards of scholarship and academic distinction in political science and in their overall academic programs are invited to membership. Membership is conferred on the basis of academic merit alone.

**Psi Chi.** Psi Chi is the national honor society in psychology, an affiliate of the American Psychological Association, and a member of the Association of College Honor Societies. Organized in five regional divisions with more than 300 active chapters, Psi Chi recognizes the academic achievement of students who meet or exceed exacting eligibility standards. The purpose of Psi Chi is to advance the science of psychology, and to encourage, stimulate, and maintain scholarship. To be nominated a student must be a declared major or be enrolled in the minor program in psychology, have completed three semesters of college study, and maintained a 3.0 cumulative grade point average and a 3.0 grade point average in at least nine credit hours of psychology courses.

**Sigma Nu Tau.** Sigma Nu Tau is a collegiate honor society recognizing students, faculty members, and entrepreneurs who have either excelled in the study of entrepreneurship or who are exemplary models of principled entrepreneurship. Requirements for membership include at least a 3.2 GPA for undergraduates who have at least 15 credits in entrepreneurial studies.

**Sigma Tau Delta.** Sigma Tau Delta's central purpose is to confer distinction upon students of the English language and literature in undergraduate, graduate, and professional studies. Sigma Tau Delta strives to confer distinction for high achievement in English language and literature in undergraduate, graduate, and professional studies; provide, through its local chapters, cultural stimulation on college campuses and promote interest in literature and the English language in surrounding communities; foster all aspects of the discipline of English, including literature, language, and writing; promote exemplary character and good fellowship among its members; exhibit high standards of academic excellence; and serve society by fostering literacy.

**Sigma Beta Tau.** Sigma Beta Tau, also known as the Society of the Blue Triangle, is The College of Engineering alumni honor society. Western New England University graduating engineering seniors whose academic work has consistently been of honor quality and have a GPA of 3.3 or greater is eligible for membership. Members of Tau Beta Pi may be invited to join Sigma Beta Tau.

**Tau Beta Pi.** Tau Beta Pi is the national honor society for engineering. Outstanding juniors and seniors inducted into Tau Beta Pi receive national recognition for their academic and professional achievements. Student members of Tau Beta Pi are also invited to join the local engineering honorary, Sigma Beta Tau, which has an active alumni group.

#### Athletics

Western New England University offers comprehensive and competitive NCAA Division III varsity programs in twenty different sports (10 men's/11 women's sports). As a full member of the Commonwealth Coast Conference, the department provides an educationally purposeful approach to providing a leading edge student-athlete experience. Athletics promotes, develops, and supports student-athlete excellence in three key areas: on the field of competition, in the classroom, and in servant leadership.

#### Recreation

Western New England University is also focused on promoting a lifelong commitment to healthy habits and holistic wellness through comprehensive recreation offerings that serve the entire student population. WNE Recreation reinforces the University cocurricular approach by advancing the development of its program participants as well as its student employees. Recreation programming includes intramurals, club sports, group fitness classes, and open fitness/recreation opportunities.

### *Facilities*

The Anthony S. Caprio Alumni Healthful Living Center (CAHLC) plays host to all indoor Athletics/Recreation offerings. Golden Bear Stadium is a state of the art FieldTurf playing surface that is home to Football, Field Hockey, and Lacrosse. Additionally there are dedicated playing surfaces for Tennis, Soccer, Baseball, and Softball. Finally, the Southwood fields provide additional space for practice and recreational opportunities

### ROTC

The University offers both Army and Air Force Reserve Officer Training Corps (ROTC) programs. The Army ROTC program is located on campus with a full-time staff. Air Force ROTC is through the University of Massachusetts at Amherst. Freshman and sophomore ROTC classes are open, with no obligation, to students interested in the development of leadership, study skills, and outdoor skills. Further ROTC training can lead to a commission as an officer in the Army or Air Force with service in the National Guard, Reserves, or on Active Duty.

Scholarships, which are merit-based and provide funds for two or three years, are available. For further information, see the Financial Aid section of this catalogue. Any Army ROTC student who desires a commission in the National Guard or Army Reserves can obtain a guaranteed reserve forces duty scholarship.

The University encourages students who are interested in the ROTC programs to confer with ROTC staff to determine eligibility requirements.

## EXPENSES AND FINANCIAL AID

## Tuition

## Undergraduate

*Full-time Student Tuition and Fees*

(12 hours or more per semester)

**Basic Annual Fees (2022-2023)**

	<b>Arts and Sciences/Business</b>	<b>Engineering</b>
Tuition (12-18 credit hours per term)	\$41,750.00*	\$41,750.00*
Student Activities Fee	\$300.00	\$300.00
Comprehensive Services Fee	\$2,450.00	\$2,450.00
Tuition and Fees	\$44,500.00	\$44,500.00

**Residential Fee**

Room (two occupants) and Board \$14,670.00 \$14,670.00

**Total** **\$59,170.00** **\$59,170.00**

Health Insurance Fee (subject to waiver) \$2,980.00\*\* \$2,980.00\*\*

*\*Students who select programs of more than 18 credit hours are charged at a rate of \$1,390.00 per credit hour for each credit hour over 18.*

*\*\*Fiscal Year 2021-2022 rate.*

*Tuition and fees for the first semester are due and payable by August 1. Second semester tuition and fees are due and payable by January 2. In order to avoid unnecessary delay at the time of registration, all students are advised to remit payments prior to the due dates.*

## Part-time Students – Undergraduate

(Less than 12 hours per semester)

Tuition per credit hour (2022-2023)	\$1,390.00
Wintersession and Summer Session Tuition per credit hour	\$ 500.00

## Graduate Students

**Graduate students are charged per credit hour as follows:**

Tuition per credit hour (2022-2023)	\$975.00
MAET	\$1,275.00 per course
MAMT	\$1,275.00 per course
Engineering Tuition	\$1,275.00 per credit
Ph.D.	\$1,525.00 per credit

## Pharmacy Students

**Basic Annual Fees (2022-2023)**

Tuition	\$44,180.00
Pharmacy Supplemental Fee	\$800.00
Comprehensive Service Fee	\$1,600.00
Student Activities Fee	\$220.00
Health Insurance Fee (subject to waiver)	\$2,980.00**

*\*\*Fiscal Year 2021-2022 rate.*

## Occupational Therapy Students

**Basic Tri-Semester Fees (2022-2023)**

Tuition per Credit	\$990.00
Supplemental Fee	\$320.00
Comprehensive Service Fee	\$545.00
Student Fee	\$185.00
Annual Health Insurance Fee (subject to waiver)	\$2,980.00**

Tri-Semester consists Fall, Spring and Summer

*\*\*Fiscal Year 2021-2022 rate.*

## Fee Structure

## All Students

**Application Fee.** The University application fee of \$40 must accompany the initial application for admission. This fee is not refundable.

**Laboratory Fees.** Laboratory fees are required for some courses and are indicated in the course descriptions. The charge covers the use of laboratory equipment, machinery, chemicals, supplies, computers, and business machines. The laboratory fees are payable at the time of registration and are not refundable.

**Transcript Fee.** As of 3/7/2022, there will be a \$10 transcript fee for a pdf copy of an official transcript, and a \$12.50 transcript fee for a paper copy of an official transcript, mailed or picked up.

## Full-Time Students

**Comprehensive Services Fee.** The Comprehensive Services Fee covers some of the costs associated with the Caprio Alumni Healthful Living Center, Campus Center, health services, counseling, placement services, technology fees, and other support activities at the University. The fee is \$1,225.00 per semester for full-time undergraduate students.

**Health Insurance Fee.** The University makes available a general health insurance program provided by an outside carrier. This program is optional. Coverage begins at the start of the school year and continues for 12 months. The fee for this program appears on the statement of charges, and, if a student elects not to participate, the waiver card included with the statement must be returned to the

Health Services Office. See the section entitled “Immunization Requirements” in the “Legal Matters” chapter of this volume for insurance requirements necessary for registration.

**Student Activities Fee.** Each undergraduate (full-time) student, by vote of the Student Association and endorsement of the Student Senate, is assessed \$150 per semester as a Student Activities Fee. Payable at the beginning of each semester, the fee is not refundable. Funds derived are allocated through the Student Senate and provide the principal source of funding for social and cultural programming, traditional events such as Spring Event; student clubs and organizations; student publications such as the newspaper and yearbook; and the radio station. The Student Activities Fee also supports publication of the *Student Handbook* and allows for cooperative funding of such programs as new student orientation, minority and international student groups, and Family and Friends Weekend.

### Residential Fees

University housing is available for full-time students in a variety of living styles. Annual undergraduate room and board fees for the 2022-2023 academic year are as follows:

Double Occupancy/ 7 Day All Access meal plan	\$14,670.00 - \$16,060.00
In Quad, Windham, Commonwealth, LaRiviere	
Gateway Apartments	*\$8,820.00
Evergreen Village	*\$12,500.00
Southwood	*\$12,500.00

\*Room fee only.

**General Housing Policy:** Students are required to live in University housing their first two years unless granted an exception to live off campus. They must be actively enrolled at the University as a full-time, undergraduate degree candidate. The Resident Student Housing Agreement is binding for the full academic year, unless the student starts mid-year, graduates or withdraws from the University. Students who are not required but request to live on campus must complete a housing application and pay a nonrefundable, nontransferable housing verification payment to participate in the housing selection process.

**Payments and Billing for Campus Residency:** The procedure differs for incoming and currently matriculating students, as follows.

For incoming students, the housing verification payment (to the amount of \$300.00) is due immediately upon notification of acceptance from the Admissions Office or as otherwise defined by the University. Receipt of this payment also authorizes student-initiated participation in the online housing selection process.

Currently matriculating students are expected to provide the housing verification payment (to the amount of \$300.00) by the application deadline. This is a non-refundable, non-transferable payment. Receipt of this payment authorizes student-initiated participation in the online housing selection process as a returning student. To confirm campus residency, the student is responsible for completing all components of the online process. Otherwise, the University rightfully presumes the student, if not required to live on campus has made other arrangements for accommodations as a commuter. Any student who submits this payment late will be placed on a waiting list and will choose his/her housing on a space available basis after students who submitted their housing verification payment on time. Proper submission of the housing verification payment and completion of the online process will result in the appropriate residency fee (room and

board charge, if applicable) billed to the student’s account with the University.

Students who are required to live on campus but do not select housing for themselves will be assigned and financially responsible for housing as long as they are enrolled and required to live on campus.

**Change to Commuter Status:** Students may not change to commuter status while they are required to live on campus. If a student who is not required to live on campus notifies the Office of Residence Life, in writing, of his/her decision to commute for the fall or spring semester by the first Monday in August, then all room and board charges for the respective fall or spring semester, except the housing verification payment, will be credited to the student’s account. After the deadline, the student is obligated to the Housing Agreement for both the fall and spring semester.

**Complete withdrawal from the University:** All room and board charges except the housing verification payment will be credited to the student’s account if (s)he has officially withdrawn from the University prior to the first day of classes for the 2022 fall semester or 2023 spring semester.

All rates are for occupancy on a semester basis and are refunded according to the Room and Board Refund Schedule. Status as a full-time student must be maintained through mid-semester to qualify for university housing. Failure to meet the established payment deadlines releases the University from any obligation to maintain the housing reservation.

Normally, University residence units must be vacated during regularly scheduled vacation periods. At the close of the academic year for which residency has been authorized, all of the student’s personal property is to be removed from the premises and the appropriate checkout procedure is to have been completed. Items left behind shall be considered abandoned and disposed of by the University.

University insurance does not cover students’ personal property. Students should obtain their own renter’s insurance or make sure their belongings are covered by their family/parents’ homeowner’s or renter’s insurance.

**Residence Hall/Area Damage Deposit.** Students are required to leave their living space in good order when departing from the University. A damage deposit of \$100 per student is required of all resident students. Damages are charged against occupants when necessary. This deposit is refundable at the end of the senior year or on withdrawal from the University. The refund will be based upon the condition of the living space at the time of departure.

### Board

Students residing in traditional or suite-style units are required to participate in a comprehensive meal plan. As such, they will be assigned to the 7 day All Access Meal Plan by the Office of Residence Life. Students residing in Gateway Village apartments, Evergreen Village, Southwood Hall, or commuting may choose to participate in a variety of alternative meal plans. Individual meals are also available on a cash basis. Meal points may be purchased in a variety of denominations and can be used for any food service on campus.

No meals are served during regularly scheduled vacation periods.

On a 7 Day All Access meal plan, the board fee for the 2022-2023 academic year is \$7,240.00.

Board fees are billed on a semester basis and are due with other student charges. Board fees are refunded according to the Room and

Board Refund Schedule. Food Service professionals are available to assist with dietary concerns, such as food allergies. Detailed documentation from a physician, outlining specific food restrictions and/or needs, should be provided to the Office of Residence Life. An opportunity will then be coordinated to review specific dietary concerns with personnel in Food Service.

Students who fail to follow this process, regardless of its outcome, are not relieved of financial obligations.

#### General Financial Information

Checks or money orders should be made payable to Western New England University. If sent by mail, they should be addressed to Enrollment Services.

The Trustees of the University reserve the right to change tuition rates or fees whenever it is deemed necessary.

Students are not permitted to attend any University exercise or class session until they have complied with all regulations concerning registration and have satisfied all financial obligations or made satisfactory arrangements for payment with Enrollment Services.

All financial obligations to the University must be met before a student may qualify for re-enrollment, a certificate of honorable dismissal, a transcript, or a diploma. The University retains the right under Title IV regulations to withhold student's transcripts because of delinquent loans.

Tuition and fees are due and payable by August 1 for first semester, by January 2 for second semester, or at the time of registration unless arrangements have been made for payments.

**Auditing:** There are no special rates for auditing a class. Students granted permission to audit a course must pay the regular tuition and fees which apply to the course.

#### Acceptance Deposit

Candidates for full-time admission or readmission, upon receiving final notice of acceptance from the director of admissions, are obliged to forward a nonrefundable acceptance deposit of \$200. Payment of this fee must be made by the date indicated in the candidate's notification of acceptance and will not, under any circumstances, be refunded. The deposit will be applied toward the tuition charges in the first semester of attendance in the academic year for which acceptance has been granted.

#### Expenses for Books and Materials

The cost of necessary books, equipment, and materials varies depending on the courses taken. The cost usually ranges from \$1,000 to \$1,400 per year.

#### Withdrawal and Refund Policy

The University operates on an academic term basis for which commitments are made to teaching staff and to others whose services are essential to the operation of the University.

As such, fees (other than tuition, and room and board) are non-refundable. Tuition, (p. 436) and Room and Board (p. 436) is refunded only as stated in the Refund Schedule below. Additionally, tuition and fees are not transferable to future semesters. Refunds will only be granted to students who voluntarily withdraw and comply with the Procedures for Withdrawing as delineated below. Where a student has been separated, dismissed or suspended from the University for academic, disciplinary, or other reasons, refunds will be granted in accordance with the Refund Schedule below.

#### Tuition Refund Schedule

Tuition refunds are made to students who voluntarily withdraw based on the following 15-week class schedule:

- 100% of the tuition charge, less the tuition deposit, will be refunded if the official withdrawal date is prior to the first day of classes;
- 75% of the tuition charge will be refunded if the official withdrawal date is during the first week of classes;
- 66 2/3% of the tuition charge will be refunded if the official withdrawal date is during the second week of classes;
- 33 1/3% of the tuition charge will be refunded if the official withdrawal date is during the third week of classes; and
- 25% of the tuition charge will be refunded if the official withdrawal date is during the fourth week of classes.

No tuition refunds will be granted after the fourth week of classes.

#### Room and Board Refund Schedule

Room and Board refunds are made to students who voluntarily withdraw after the start of semester, based on the following 15-week class schedule:

- 100% of the room and board charge, less the housing verification payment, will be refunded if the official withdrawal date is prior to the first day of classes;
- 80% of the room and board charge will be refunded if the official withdrawal date is during the first week of classes;
- 60% of the room and board charge will be refunded if the official withdrawal date is during the second week of classes;
- 40% of the room and board charge will be refunded if the official withdrawal date is during the third week of classes; and
- 20% of the room and board charge will be refunded if the official withdrawal date is during the fourth week of classes.

No room and board refunds will be granted after the fourth week of classes. Students who are suspended, dismissed or otherwise involuntarily withdrawn from the University will not receive refunds.

#### Procedure for Withdrawing

If it becomes necessary for undergraduate degree students to withdraw or request a leave of absence from the University, an Application for Withdrawal or Absence from Campus form must be completed and filed with the Academic Success Center. (Please note that mid-semester Medical Leave requests will be submitted to the Dean of Students office using the Medical Leave Request form. See section on Medical Leave (p. 22)). Prior to completing the Application for Withdrawal or Absence from Campus form, students are expected to consult with the Dean of First Year Students & Students in Transition in order to complete a formal exit interview. Withdrawal and leave requests will be made part of the student's permanent record maintained in Enrollment Services.

When extenuating circumstances prevent a student from filing the form in person, an application for withdrawal by email is acceptable. The email should state the reasons necessitating the withdrawal and should be directed to the Dean of First Year Students. In the case of graduate and professional students, withdrawal forms are filed with the Law School Registrar or the academic dean's office of the college in which the student's major is administered.

The effective date of an official withdrawal is the date the student

submits written notification of the intent to withdraw to the University's designated offices as described in this policy. If a student leaves the University without providing official notification, the withdrawal date is the midpoint of the payment period or period of enrollment, as applicable, or the date of an academically-related activity in which the student participated. Academically-related activities include physically attending a class where there is an opportunity for direct interaction between the instructor and students; submitting an academic assignment; taking an exam, an interactive tutorial or computer-assisted instruction; attending a study group that is assigned by the University; participating in an online discussion about academic matters; and initiating contact with a faculty member to ask a question about the academic subject studied in the course.

Any approved refunds will be computed on the basis of the effective date described above. Absence from class without completing a withdrawal form does not constitute withdrawal, and submission of course drop forms may not substitute for a withdrawal. Refunds are made in accordance with the Tuition Refund Schedule and the Room and Board Refund Schedule. Students who withdraw with an unpaid balance will be financially liable for any amount remaining unpaid after a refund credit, if any, has been applied to the balance. Students who withdraw from the University will have transcripts withheld until all financial obligations have been met.

Any refund resulting from a reduction in the number of hours registered will be made on the basis of the above schedule. Students taking between 12 and 18 hours per term will not have any adjustment in tuition if, after the course reduction, they are still enrolled in 12 to 18 credit hours. The Higher Education Amendments of 1998 require students receiving Federal Title IV financial assistance who withdraw or otherwise cease attendance on or before 60 percent of the way through the semester to have their assistance reduced based on calendar days enrolled versus the length of the semester. Programs affected are Pell Grants, Supplemental Education Opportunity Grants, Federal Direct Ford Subsidized Loans, Federal Direct Ford Unsubsidized Loans, and Federal Direct Ford Plus Loans but not Federal Work-Study. The calculation of the amount to be returned to these funds may result in the student owing a balance to the University and/or the Federal Government. Institutional scholarships and grants will be adjusted according to the same percentage as tuition charges. State Aid will be adjusted according to the same percentage as the federal aid.

#### Late Payment Charge

A finance charge will be computed by a period rate of one percent per month, which is an annual percentage rate of 12 percent applied to the prior balance after deducting current payments and/or credits appearing on the statement. In no case will a student be able to continue enrollment if the previous semester's charges are not paid.

#### Veterans Benefits and Transition Act of 2018

Veterans Benefits and Transition Act of 2018 S.2248 Section 103.1(b).

A Covered Individual is any individual who is entitled to educational assistance under chapter 31, Vocational Rehabilitation and Employment, or chapter 33, Post-9/11 GI Bill @benefits.

Western New England University will not impose any penalty, including the assessment of late fees, the denial of access to classes, libraries, or other institutional facilities, or the requirement that a covered individual borrow additional funds, on any covered individual because of the individual's inability to meet his or her financial obligations to the institution due to the delayed disbursement funding from VA under chapter 31 or 33.

Any covered individual is permitted to attend or participate in the course of education during the period beginning on the date on which the individual provides to the educational institution a certificate of eligibility for entitlement to educational assistance under chapter 31 or 33 a "certificate of eligibility" can also include a "Statement of Benefits" obtained from the Department of Veterans Affairs' (VA) website – eBenefits, or a VAF 28-1905 form for chapter 31 authorization purposes) and ending on the earlier of the following dates:

The date on which payment from VA is made to the institution.

90 days after the date the institution certified tuition and fees following the receipt of the certificate of eligibility.

#### Payment Plan

Western New England University has partnered with Official Payments to offer a secure and convenient payment plan option for fall and spring semesters.

Enrollment in the payment plan is by semester. The enrollment fee is \$50 (non-refundable) per semester.

The fall semester plan begins July 1st and runs through November 1st. The enrollment period for this plan begins in June.

The spring semester plan begins December 1st and runs through April 1st. The enrollment period for this plan begins in November.

Before enrolling in your plan, please have all private loans and/or outside scholarships in place and waive the health insurance, if applicable.

If there are any questions, please contact Enrollment Services at 413-796-2080.

#### Sibling Discount

This is a \$1,000/year sibling discount offered to each sibling when a family has more than one full-time undergraduate child attending Western New England University in a given year. Each student receives a \$1,000 credit applied to the tuition billing. The discount only applies to sibling relationships and is only available to full-time undergraduate students.

#### Employer Extension Plan

This tuition is appropriate for students who receive reimbursement that is paid directly to them, not to the University. Under this plan students have their employer verify eligibility to participate in the plan. Students may defer two-thirds of their tuition payment until 30 days after the semester is completed.

#### Tuition Paid Directly by Employers

Students whose tuition is underwritten by their employers must furnish at the time of registration, or immediately thereafter, an authorization from the employer indicating that the company is

directly paying the cost of tuition. Students with direct pay by their employers remain responsible for their bills.

#### Financial Aid

The University offers a program of financial assistance through scholarships, grants, loans, and part-time employment. Resources are, however, limited. Students and their families are expected to defray as much of their educational expenses as possible. Financial aid should be considered only as supplemental assistance. Financial aid programs, policies, and procedures for applying are subject to change. Visit the website at <https://www1.wne.edu/enrollment-services/index.cfm> or consult Enrollment Services for current details. Work opportunities are available both on campus and in the community, and many students earn a portion of their college expenses through part-time employment. Because of the academic demands upon a student's time, no student should work more than 20 hours per week.

Prospective students must be officially accepted for admission into a degree program at the University before their applications for financial assistance will be considered. Part-time students must have final approval into a degree program and be enrolled in at least six credits per term to be eligible for financial aid. Graduate students must have final approval into a degree program and be enrolled in at least 3 credits per term to be eligible for financial aid.

Students applying for any federal or state aid must submit the Free Application for Federal Student Aid (FAFSA) for processing as soon as possible after October 1. These forms may be accessed at [www.fafsa.gov](http://www.fafsa.gov). Applications for prospective students are processed on a rolling basis beginning on December 1. All FAFSA's for returning students must be received by Western New England University before March 1 in order to receive priority consideration. Verification of income will be verified by the completion of the IRS Data Retrieval on the FAFSA. Late applicants may be considered for financial aid if sufficient funds are available.

Aid is generally disbursed on an August to May basis. All students must reapply for financial aid each year, and aid in any year does not guarantee aid in subsequent years.

Students must make satisfactory academic progress toward their degree requirements to qualify for financial aid and scholarships. Satisfactory progress includes maintaining a prescribed grade-point average and successfully completing a minimum number of credit hours each year. Copies of the complete "Satisfactory Academic Progress" policy are available from Enrollment Services at <https://www1.wne.edu/enrollment-services/financial-aid/index.cfm>.

#### Scholarships and Grants

Scholarships/grants are need based unless stated otherwise. You are automatically considered during the financial aid application process. Information on scholarships and grants can be found at [www.wne.edu/giving](http://www.wne.edu/giving). You must maintain satisfactory academic progress and register for selective service (if required) to be eligible for any scholarships or grants listed below.

#### *Adult Learner Scholarship - For Graduate and Undergraduate Study*

Adult Learner Scholarships are awarded to degree-seeking graduate and part-time (less than 12 credits per term/semester) undergraduate students. Students must have a financial need, and must be taking classes on the Springfield campus or online.

#### *George I Alden Scholarship*

Scholarships are awarded annually from a fund established by the trustees of The George I. Alden Trust in Worcester, MA, and by alumni and friends of the University. Funds are awarded to full-time undergraduate students and to graduate or professional students who have a demonstrated financial need.

#### *Alumni Association Golf Tournament Endowed Scholarship*

This scholarship is awarded to a junior who is a returning student and who has a cumulative Western New England University GPA of at least 3.0. The student must have demonstrated financial need and have been involved in University student organizations or community service programs. Preference is given to students who graduated from a high school in Massachusetts or Connecticut. The scholarship is renewable for the student's senior year provided they continue to maintain a GPA of at least 3.0 and meet the other scholarship criteria. This endowed scholarship was established by the Western New England University Alumni Association through funds raised from its annual golf tournament. The tournament is one of the longest standing traditions in the Alumni Association's history, and scholarship recipients are encouraged to attend the event each year that they receive the scholarship.

#### *Alumni Endowed Scholarship*

Scholarship awards are made annually by the Alumni Association to a full-time student from each of the Colleges of Arts and Sciences, Business, and Engineering. Two awards are also made to part-time students. The University selects the recipients on the basis of academic merit and demonstrated financial need.

#### *American Society of Mechanical Engineers Scholarship*

Scholarships of varying amounts are awarded annually to students majoring in Mechanical Engineering who excel in scholarship and have made a significant contribution to the Mechanical Engineering program at the University. Additionally, their grades should warrant continuing in Mechanical Engineering. The students shall either be juniors or seniors at the start of the next semester. The scholarship is funded by contributions from the Western Massachusetts Section of the American Society of Mechanical Engineers.

#### *Edward L. and Robert L. Anastasi Endowed Scholarship*

A scholarship is awarded to an undergraduate student in the College of Business, majoring in Management. The recipient must have a cumulative high school GPA of 3.0 or higher and have demonstrated financial need. The scholarship is awarded starting in the freshman year and can be renewed for the student's subsequent undergraduate years at the University provided he or she maintains a GPA of at least 3.0 and continues to have financial need. Edward L. "Ted" Anastasi received his Bachelor of Science in Business Administration majoring in Management from Western New England College in 1989. Ted is currently a Vice President with Fidelity Investments. Robert L. Anastasi received his Bachelor of Science in Business Administration majoring in Management from Western New England College in 1985. Rob is currently a Vice President with Anastasi Masonry Construction, Inc. This endowed scholarship was created through the generosity of Ted Anastasi '89 BSBA.

#### *Dr. Emma Wilder Anderson Endowed Scholarship*

This scholarship of not less than \$1,000 was established through gifts to an endowment fund by friends, family, and admirers in honor of Dr. Emma Wilder Anderson (1903-1998), distinguished civic leader, internationalist, and devoted friend of Western New England. In recognition of her accomplishments, of her contributions to society and to the local Springfield community, and of the spirit of hope she

embodied, Dr. Anderson was awarded the honorary degree of Doctor of Humane Letters by Western New England College on May 16, 1998.

This merit scholarship is awarded to a returning full-time student, U.S. citizen, or international, with a GPA of at least 3.0 in the first semester of the first year, with a record of community service and volunteerism while at the University or prior to studying at the University, and with a commitment to engage in service on or off campus while a student at the University. The scholarship is renewable upon demonstration of meeting the established criteria for the scholarship.

#### *Asadorian Family Scholarship*

A \$1,000 scholarship is available to a College of Business student from Rhode Island based upon financial need. This scholarship is renewable for the student's subsequent years at the University provided he/she continues to meet the scholarship criteria. This scholarship was generously established by Guy Asadorian. Guy is a 1986 graduate of Western New England, receiving his Bachelor of Science in Business Administration in Finance. A former member of the Golden Bears football and baseball teams, Guy Asadorian is a Principal and Co-Founder of Tameracq Partners, Inc., a Providence, RI-based mergers and acquisitions firm that specializes in advising buyers and sellers of middle market companies. Guy and his wife Ann live in East Greenwich, RI.

#### *Banknorth Endowed Scholarship*

This scholarship is available to a full-time undergraduate student who is a resident of Massachusetts, Connecticut, Maine, New Hampshire, Vermont, or New York. The recipient must have demonstrated financial need. This endowed scholarship fund was created through the generosity of the Banknorth Charitable Foundation.

#### *Barnhard Family Endowed Scholarship*

This scholarship is awarded to a senior who is due to graduate during the same academic year "for which" the award is made. The student must be enrolled in the College of Arts and Sciences, with preference given to students majoring in History and who are from out of state. The student must live on campus and have a University cumulative GPA of 3.0 or better. This endowed scholarship is generously funded by the Barnhard family and Ronald H. Barnhard '70 BA.

#### *Henry J. Bazan Endowed Scholarship*

A scholarship fund has been established by the Management Association and alumni in honor of Professor Henry J. Bazan, a faculty member from 1963 to 2000. A scholarship is awarded to a student in the College of Business. Preference is given to students who are involved in a leadership position in a student organization or are enrolled in ROTC.

#### *Mark Berthiaume and Betsey Thompson Scholarship*

A scholarship of \$1,000 is awarded to a full-time freshman with demonstrated financial need. If the student continues to meet the criteria, the scholarship is renewable and will provide financial aid support for the student's four years at the University. The scholarship was established through the generosity of Mark L. Berthiaume '78 BSBA and his wife, Betsey Thompson.

#### *Frank Stanley Beveridge Endowed Scholarship*

This scholarship is awarded to students from the Massachusetts counties of Hampden or Hampshire who have demonstrated financial need. The endowed scholarship is made possible by a contribution from The Frank Stanley Beveridge Foundation, Inc., a private family foundation directed by the family and descendants of the late Frank

Stanley Beveridge, founder of Stanley Home Products, Inc. Through the years, the Foundation has been a generous supporter of Western New England University. Joseph Beveridge Palmer, a director of the Foundation, is a 1967 graduate of Western New England University.

#### *Henry D. Blake Endowed Memorial Scholarship*

This scholarship is awarded to a student pursuing a degree in Business who has demonstrated financial need. This fund was established by Henry D. Blake's wife, Rose Breslin Blake, in honor of his outstanding accomplishments in the educational field.

#### *Susan Squire Bousquet Endowed Memorial Scholarship*

A scholarship is awarded annually to a student in Continuing Education with demonstrated financial need. Susan was a student at the Western New England when she passed away in 1988. Her family and friends established this scholarship in her memory.

#### *Julie K. Boyce Endowed Memorial Scholarship*

Scholarships of varying amounts up to one-half tuition cost are awarded annually to undergraduate students who have demonstrated financial need and academic promise. Preference is given to students majoring in English. This fund was established by Mr. and Mrs. Terry S. Boyce in memory of their daughter, Julie K. Boyce, a member of the Class of 1990. Miss Boyce passed away during the final semester of her senior year. While a student at Western New England, Julie was active with many groups and served as Editor-in-Chief of *The Cupola* as well as on the staffs of *The Westerner* and the *Review of Arts and Literature*.

#### *Hayden S. and Catherine L. Bradley Endowed Memorial Scholarship*

Two scholarships of not less than \$1,250 each are awarded per year to full- or part-time students who have attained sophomore standing prior to the beginning of the fall semester. Recipients must have demonstrated financial need, have a Western New England University cumulative GPA of 2.7 or better, and be from western Massachusetts, with preference for graduates of East Longmeadow High School. Transfer students are not eligible to receive the scholarship. The scholarship will be renewed for the student's junior and senior years provided they continue to meet the award criteria. The scholarship is given to two students, one majoring in Finance, and one majoring in either Social Work or Biomedical Engineering. Should recipients subsequently change their academic majors, they will still be eligible to receive the scholarship. This endowed scholarship was created through the generosity of Hayden L. Bradley in memory of his parents. Mr. Bradley earned a Bachelor of Science in Mechanical Engineering, graduating with the Class of 1964, and had a distinguished career at General Electric in Pittsfield, MA. He has been an active volunteer for the Western New England University Alumni Association, including serving on the Alumni Association Executive Committee from 1999-2004.

#### *Brennan Family Endowed Scholarship*

This scholarship is awarded to a full- or part-time freshman in the College of Engineering whose high school GPA is a 3.0 or higher and has demonstrated financial need. The scholarship can be renewed for the student's subsequent undergraduate years at the University provided he or she maintains a GPA of at least 3.0 from the previous academic year and continues to have financial need. This endowed scholarship was created through the generosity of John J. Brennan, who earned his Bachelor of Science in Electrical Engineering in 1971.



*Frederick N. and Maria E. Bromage Endowed Memorial Scholarship*

Scholarships of varying amounts are awarded to full-time undergraduate students based on financial need from a fund established by Frederick '34 BBA/'61 MBA and Maria Bromage.

*Irl and Peg Brown Scholarship*

A scholarship is available to a student with demonstrated financial need and academic merit who is enrolled in the College of Business. This scholarship was generously created by Irl O. '57BBA and Peg Brown.

*John J. Brown Endowed Memorial Scholarship*

This scholarship is awarded to students majoring in Mechanical Engineering beginning in their junior year. Recipients must have a Western New England University cumulative GPA of 3.3 or higher, be members of the American Society of Mechanical Engineers, and have demonstrated financial need. The scholarship is renewable for students' senior year provided they continue to meet the award criteria. This endowed scholarship was created through a bequest by Mae E. Brown to honor the memory of her son, John J. Brown. Mr. Brown was a graduate of the Class of 1964 who earned the degree of Bachelor of Science in Mechanical Engineering. He passed away November 1, 1996. Mrs. Brown passed away April 13, 2004.

*BTP Systems Endowed Scholarship*

A merit scholarship is available to an engineering student in his or her junior or senior year. The student must have a minimum major and overall GPA which if continued would qualify the student to graduate with Magna Cum Laude honors and must maintain this academic threshold in order to maintain this award in subsequent semesters. There is a strong preference for an Electrical Engineering major focusing their studies in the area of RF/Microwave Engineering and who is currently pursuing a program of study consistent with the College of Engineering's recommended RF/Microwave Engineering Sequence of courses. In any year, where there is more than one qualified candidate for this scholarship, there is a tiebreaker preference for a student who lives within a fifty mile radius of Ludlow, MA. Philip C. and Jill Beaudry have generously created this scholarship in order to help increase awareness in the career field of RF/Microwave Engineering. In establishing this award, Philip and Jill Beaudry hope to encourage bright young engineers to pursue studies within this growing area of expertise and to in turn expand the number of local engineering professionals with an expertise within the RF specialty. BTP Systems, LLC was founded in Ludlow, MA in October 2003, by President Philip C. Beaudry. Since its inception, BTP Systems has been committed to providing its customers with a team of professionals with the right attitude, experience, and strong desire to excel. Its team is fully focused on the success of its customers, always striving to exceed expectations.

*Janet Johnson Bullard Scholarship*

A scholarship of \$1,000 is awarded to a full-time freshman with demonstrated financial need. If the student continues to meet the criteria, the scholarship is renewable and will provide financial aid support for the student's four years at the University. This scholarship was established through the generosity of Janet Johnson Bullard '69 BBA.

*Coach Richard Burns Memorial Bowling Scholarship*

A \$500 scholarship is awarded annually to a returning sophomore or junior with a minimum grade point average of 3.0. There is a preference for a member of the Western New England University

bowling team to receive this award. Should a member of the Bowling Team fail to qualify for this scholarship, then preference should go towards a student who is majoring in education. Richard "Dick" Burns was associated with the Western New England bowling program for 40 years, including 33 years as head coach of the varsity team. He was cofounder of the Tri-State Bowling Conference. Dick was a 1950 graduate of Nebraska Wesleyan University, served on a numerous national collegiate bowling committees and was the sectional coordinator for seven seasons. He also was a member of the National Collegiate Bowling Coaches Association All-America selection committee. Dick was a professor of science and education and faculty member at Western New England from 1958 until his retirement in 1995. He passed away on Feb. 9, 1999. This scholarship was generously created by Coach Burns' friends and former bowlers in memory of his dedication to Western New England, its bowling team, and his players.

*Evelyn Burton Endowed Scholarship Fund*

Scholarships of varying amounts are awarded based on demonstrated financial need to students who are single parents. This scholarship is provided from a fund established by University Trustee Thomas R. Burton '70 BSBA in memory of his mother, Evelyn.

*Kathleen and Thomas Burton Endowed Scholarship*

Scholarship awards in varying amounts are available to students from Massachusetts and Connecticut. Recipients may be enrolled in any program within the University and must have a demonstrated financial need. This scholarship is provided from a fund established by University Trustee, Thomas R. Burton '70BSBA and his wife Kathleen.

*William F. Campanella Endowed Memorial Scholarship*

This scholarship is awarded to a full-time undergraduate student beginning in his or her sophomore year who has demonstrated the following: involvement in the community, either through work in Western New England University organizations and/or through volunteer work in the greater Springfield, MA, community; and/or involvement in one or more of the fine arts, through study of the arts or through the practice of the arts. The student must have financial need and maintain a minimum of a 3.0 GPA. Preference will be given to minority students and to students who graduated from a high school in Springfield, MA. This scholarship was established by family, friends, and colleagues of Bill Campanella, who passed away unexpectedly on April 26, 2003. Bill's passion for and devotion to community service was demonstrated by his involvement with the Western New England College campus as well as through his volunteer work with a wide array of community organizations in the greater Springfield area. Bill touched many lives through his excellent abilities as a listener, the guidance he offered, and through the quiet leadership he exhibited in pursuit of a goal. He served Western New England College as admissions counselor, then alumni program director, and finally as associate director of alumni relations.

*Dr. Anthony S. Caprio Endowed Minority Merit Scholarship*

Merit scholarships of varying amounts will be awarded to a minority student or students who have demonstrated superior academic achievement through performance in high school or college. When financial need is a factor, this scholarship shall be in addition to any amount the student might otherwise receive. This award is renewed each year provided the student attains a Dean's List standing at Western New England University. This scholarship has been established through a gift by President Anthony S. Caprio.

*Esther and Salvatore Caprio Endowed Scholarship*

This merit scholarship was funded by a gift to the endowment fund of the University by Esther and Salvatore Caprio, friends of the University and parents of the University's fifth president. A scholarship of not less than \$500 will be awarded to a student who at the time of application is a resident of Rhode Island, is beginning full-time study at Western New England University either as a first year or transfer student, and who has demonstrated superior academic achievement in high school or college. It is renewable when the student continues full-time study at the University and maintains a cumulative GPA of 3.0 or above. The scholarship will be in addition to whatever gift award has been made by the University, based on either merit or need. When the Rhode Island student has initially been awarded a strictly merit based scholarship by the University, this scholarship will be added to the award at that time, thereby augmenting the award. When a scholarship has been awarded based on demonstrated need, this merit scholarship will replace a portion of the loan component in the financial aid award.

*Carman Family Charitable Foundation Endowed Scholarship*

This scholarship is awarded to students with demonstrated financial need. The scholarship was established through the generosity of Leon J. Carman, a graduate of the Western New England University School of Law, Class of 1941, and recipient of the honorary degree Doctor of Humane Letters in 1998 from Western New England College; Mr. Carman's son Barry I. Carman is also a graduate of the School of Law, Class of 1993; and his son Tracy E. Carman is an alumnus of the College of Business, having earned the MBA in 1990. The members of the Carman family have been longtime generous supporters of Western New England, donating and helping raise funds annually for the institution and its School of Law.

*Sandra and Robert Carnevale Endowed Scholarship*

A scholarship is awarded to a student in the College of Business based on demonstrated financial need and demonstrated academic ability. Preference is given to students who have an entrepreneurial drive, exhibited leadership skills, and have overcome adversity. The scholarship is provided by a fund established by University trustee Robert Carnevale '68 BSBA and his wife, Sandra.

*Richard M. and Catherine Cassata Scholarship*

A scholarship is available to student enrolled in the College of Business based on financial need. This scholarship was generously created by Richard and Catherine Cassata. Richard received his Bachelor of Science in Business Administration in Finance from Western New England in 1980 and was a member of the Golden Bear Baseball team. Richard is currently a Managing Director at Assured Guaranty Corporation in New York. Richard and his wife, Catherine reside in New Jersey.

*Norman J. and Doris S. Cartmill Endowed Scholarship*

This is a merit scholarship for a returning part-time student majoring in business who has completed 30 credits. It was funded by a gift from Western New England University Trustee Emeritus Norman J. Cartmill '50BBA/'61MBA/'01Bacc(hon) and his wife, Doris.

*Chester J. Chambers Memorial Scholarship*

Scholarships are awarded annually to students from Longmeadow or Springfield who have demonstrated financial need. The scholarship is funded through a trust established in memory of Chester J. Chambers '23 LL.B., who served as a trustee of Western New England College from 1959-1969, and by his wife, Margaret E. Chambers.

*Leon D. Chapin Endowed Scholarship*

A scholarship is awarded to a full-time undergraduate student majoring in accounting and beginning the senior year. The student must have a GPA that, if continued, would qualify to graduate summa or magna cum laude. This scholarship is from a fund established in honor of Leon D. Chapin, who served as chief fiscal officer at Western New England College from 1945 to 1979 and was executive vice president of the institution at the time of his retirement in August 1979.

*The Chessey Family Endowed Scholarship*

This scholarship is awarded to a full-time undergraduate student majoring in Accounting and/or Finance. This endowed scholarship was created through the generosity of Sandra and Joseph J. Chessey, Jr. Sandy graduated with her bachelor's degree from Western New England College in 1985, and earned her master's degree in Business Administration from Western New England in 1990. She served the institution as controller from 1998 until 2003, and as Assistant Vice President for Finance and Administration from 2003 until 2011.

*Professor Ralph Chimelis and Mrs. Florence B. Chimelis Endowed Scholarship*

Scholarships are awarded to students of Western New England University who have demonstrated financial need. This endowed scholarship was established through a generous bequest by Florence B. Chimelis in honor of her husband, Professor Ralph Chimelis. Professor Chimelis was the first Spanish teacher at Western New England College, serving from 1970 until his retirement in 1983.

*Arthur and Barbara Clarke Endowed Scholarship*

Funds are available to undergraduate students with demonstrated financial need. The late Arthur Clarke was a longtime friend, benefactor, and trustee of Western New England College.

*Robert W. and Holly S. Clarke Endowed Scholarship*

A scholarship is awarded to a full- or part-time undergraduate student who has demonstrated financial need, maintains a GPA of 3.0 or better, and is enrolled in the College of Arts and Sciences. This scholarship was established through the generosity of University Trustee Robert W. Clarke and his wife, Holly S. Clarke.

*Class Council Leadership Scholarship*

A scholarship of a minimum of \$1000 is awarded annually to a returning senior who has a cumulative Western New England University GPA of at least 2.75. The student must have demonstrated outstanding leadership and have been involved in University student organizations for at least two years. The scholarship may be awarded to a student in a paid or unpaid leadership position who has consistently devoted time to co-curricular programs. This scholarship was established by the Class of 2012 Council and continues to be funded through funds raised from annual senior fundraising events such as Jail Bail.

*Class of 1986 Endowed Scholarship*

This scholarship is awarded to full- or part-time freshmen in the College of Engineering who have demonstrated financial need and a cumulative high school GPA of 3.0 or better. Preference is given to students from greater Springfield. The scholarship is renewable provided the students continue to meet the criteria and maintain a cumulative university GPA of 3.0, but the scholarship can be awarded to a student for a maximum of five years. This endowed scholarship was initiated through the generosity of alumnus Albert L. Plante, who earned his B.S. in Electrical Engineering in 1986 and his M.S. in Electrical Engineering in 1990.

*Steven E. Cocchi Endowed Memorial Scholarship*

Scholarships are awarded annually to undergraduate students, with preference given to junior and senior undergraduate College of Business students from the greater Springfield area. The fund was created by the parents of Steven Cocchi in his memory after he passed away while a student at Western New England College.

*Mark A. Coffey Endowed Memorial Scholarship*

This scholarship is awarded to an Accounting major with preference given to transfer students. The recipient must have demonstrated financial need and a 3.0 cumulative GPA. For an entering freshman, the GPA requirement is based on the four years of the student's high school education; for an entering transfer student, it is based on the cumulative GPA at their prior institution; for a returning Western New England University student, it is based on the cumulative GPA for their entire college education. The scholarship was established by family, friends, colleagues, and students of Mark A. Coffey, professor of accounting, who taught at Western New England College for 28 years. Professor Coffey served as chair of the Department of Accounting and Finance for two years and collaborated in the development of the Master of Science in Accounting degree program. He was the faculty advisor for the Student Accounting Association. Through the founding of the Student Accounting Association's annual golf tournament, he helped initiate a means of networking among accounting professionals, accounting firms, and accounting students. Professor Coffey was very active in Western New England College's Faculty Senate, the Stageless Players, and the intramural sports program. He passed away June 6, 2002.

*College of Arts and Sciences Annual Financial Grant*

Annually an award is made to a student enrolled in the College of Arts and Sciences with demonstrated financial need.

*College of Arts and Sciences Endowed Scholarship*

Funded by the Endowment for Student Financial Aid for the College of Arts and Sciences, this annual scholarship is awarded to undergraduate, upper-class, full-time students in the College of Arts and Sciences with demonstrated financial need and minimum cumulative GPAs of at least 3.0. Contributions from alumni, staff, and friends of the University fund this endowed scholarship.

*College of Business Annual Financial Aid Grant*

Annually an award is made to a student enrolled in the College of Business with demonstrated financial aid.

*College of Business Endowed Scholarship*

Funded by the Endowment for Student Financial Aid for the College of Business, this annual scholarship is awarded to undergraduate, upper-class, full-time students in the College of Business with demonstrated financial need and minimum cumulative GPAs of at least 3.0. Contributions from alumni, staff, and friends of the University fund this endowed scholarship.

*College of Business Board of Advisors Scholarship*

A \$2,500 scholarship is awarded annually to a full-time undergraduate student enrolled in the College of Business. In order to qualify for this scholarship, a recipient must have a minimum grade point average of 3.0. The scholarship will be initially awarded to a freshman and may be renewed for subsequent years provided the student continues to meet the criteria of the fund. This scholarship was generously created by the Board of Advisors to Western New England University's College of Business.

*College of Engineering Annual Financial Aid Grant*

Annually an award is made to a student enrolled in the College of Engineering with demonstrated financial aid.

*College of Engineering Endowed Scholarship*

Funded by the Endowment for Student Financial Aid for the College of Engineering, this annual scholarship is awarded to undergraduate, upper-class, full-time students in the College of Engineering with demonstrated financial need and minimum cumulative GPAs of at least 3.0. Contributions from alumni, staff, and friends of the University fund this endowed scholarship. Additional generous support was provided by the Engineering Society of Western Massachusetts.

*Bruce D. Corl Memorial Scholarship*

A \$1,000 scholarship is awarded to a student pursuing a degree in the College of Business who has demonstrated financial need. This scholarship was created by Alex M. Corl '84 BSBA in honor of his brother Bruce D. Corl, who passed away at the age of 45 after a courageous battle with lung cancer.

*Louis T. Cormier Endowed Memorial Scholarship*

A scholarship is awarded annually to a sophomore who is a candidate for a degree in Accounting, stands in the upper third of the class, and demonstrates qualities of good citizenship and leadership. This fund was established by Mary T. Cormier in memory of her husband, Thomas Cormier '47 BSBA, formerly of the faculty of the School of Business.

*Denise G. Crawford Endowed Scholarship*

This scholarship is awarded to a part-time student in the College of Business. The scholarship was established by Mrs. Crawford's husband, Walter J. Crawford '61BBA, family, and friends in recognition of Mrs. Crawford's 35 years of outstanding service to her alma mater. At the time of her retirement, Denise Crawford '61BBA was the staff assistant to the academic vice president.

*Kevin S. Delbridge Endowed Scholarship*

A scholarship is awarded to a full-time student from Massachusetts who resides within a 15 mile radius of Springfield, MA, and is enrolled in the College of Business. The award is based on financial need and demonstrated academic ability. This scholarship is provided from a fund established by University Trustee Kevin S. Delbridge '77 BSBA.

*The Delbridge Family Endowed Scholarship*

A scholarship is awarded to full-time undergraduates from Massachusetts who reside within a 15 mile radius of Springfield, MA, and who major in a program within the Departments of Physical and Biological Sciences or Psychology. The award is based on financial need and demonstrated academic ability. This scholarship is provided from a fund established by chairman of the Board of Trustees, Kevin S. Delbridge '77 BSBA and his wife, Sandra E. Delbridge.

*The Richard and Judith DiRuzza Annual Scholarship*

An annual scholarship is awarded to a student entering the junior year who has exhibited leadership abilities through participation in co-curricular activities at Western New England University and who has financial need. This scholarship was created by friends and colleagues to honor Dr. Richard M. DiRuzza on the occasion of his retirement from the University after 18 years of service at Western New England College, first as dean of students (1991-2001) and then

eight years as vice president for student affairs and dean of students (2001-2009).

#### *Diversity Scholarship of Greater Springfield*

Merit scholarships of varying amounts are granted to minority students from the greater Springfield area.

#### *Doherty Family Endowed Scholarship*

Scholarships are awarded to students from the counties of Hampden, Hampshire, or Franklin, Massachusetts, who have demonstrated financial need. This endowed scholarship was established by Paul S. Doherty, Esq. and Dianne F. Doherty. Mr. Doherty has been a longstanding friend of Western New England and served as a member of the Board of Trustees from 1973 to 1986. Mrs. Doherty received her Master of Business Administration from Western New England College in 1981.

#### *Henry T. and Margaret S. Downey Endowed Memorial Scholarship*

Scholarships of varying amounts are granted to undergraduate accounting students and to law students. The scholarship was established by family, friends, colleagues, and the Western New England College Board of Trustees in memory of Henry T. Downey (1920-1973) and Margaret S. Downey (1916-2006). Mr. Downey earned his Bachelor of Business Administration from Northeastern University-Springfield Division in 1950 and his law degree from the Western New England College School of Law in 1956. His dedication to Western New England is demonstrated by his service on the Corporate Board from 1960 to 1964 and on the Board of Trustees from 1964 to 1973. He served as vice-chairman of the Board of Trustees from 1971 to 1973. Mr. Downey played a key role in establishing the full-time law program at the School of Law. Mrs. Downey earned her Bachelor of Business Administration from Northeastern University-Springfield Division in 1949 and received an Honorary Baccalaureate degree from Western New England College in 2001.

#### *Faculty and Staff Endowed Scholarship*

This scholarship is awarded to students demonstrating financial need. The funds for the scholarship have been contributed through the years in honor or memory of various faculty and staff of Western New England University.

#### *Rocco J. Falcone Endowed Scholarship*

A scholarship is available to a College of Business student based on financial need. There is a preference for a student that is either a current employee or immediate family member of an employee of Rocky's Hardware, Inc. Should there not be a student that meets the above criteria in any given year, the scholarship should be awarded to a student residing in Hampden County, MA but shall not be renewed in subsequent years, if an eligible candidate that meets the first preference becomes known. This scholarship was generously created by Rocky's Hardware, Inc. Founded in 1926, by Rocco (Rocky) J. Falcone in Springfield, MA, Rocky's is a family-owned business that has been supporting local communities for over 85 years.

#### *Financial Aid Endowed Fund*

Scholarships of varying amounts are awarded annually to deserving students who have demonstrated financial need.

#### *Frank P. Fitzgerald, P.C., Endowed Scholarship*

A scholarship of not less than \$1,000 is awarded to students who are enrolled full-time as undergraduates or in the School of Law and who have demonstrated financial need. The scholarship is renewable when

the student continues full-time study at the University and makes satisfactory progress toward degree completion. This scholarship was funded by a gift to the endowment fund by University Trustee Frank P. Fitzgerald '68 BSBA/'73 JD.

#### *Kevin G. Foley Endowed Memorial Scholarship*

A scholarship is available to an undergraduate student majoring in mechanical engineering based on a combination of financial need and merit. There is a preference for a student that resides within the greater Springfield, MA area. The scholarship is renewable for subsequent years provided the recipient continues to meet the scholarship criteria. This scholarship was generously created by the family and friends of Kevin G. Foley in his memory. Kevin G. Foley received his Bachelor of Science in Mechanical Engineering in 1967 and his Master of Business Administration in 1972, both from Western New England College. Kevin had been employed by Smith and Wesson for 25 years, ending his career as the Vice President for Engineering

#### *Fontaine Bros., Inc. Endowed Scholarship*

This scholarship is awarded to a student who has transferred to Western New England University from Springfield Technical Community College. The student can be pursuing a degree in any program of the University. This endowed scholarship was made possible through the generosity of Fontaine Bros., Inc. Fontaine Bros., Inc. is a privately held construction company based in Springfield. Founded in 1933 by Eudore J. Fontaine and his brother George, the company has since grown to become one of the most trusted and respected builders in New England. The firm is currently headed by third generation builders David and Chris Fontaine.

#### *Fund for Western New England Annual Scholarship*

Annually awards are made to students enrolled in any program within the University who have demonstrated financial aid.

#### *Constance Gleason Furcolo Endowed Scholarship*

This scholarship is awarded to students who are pursuing degrees in business and/or law and who have demonstrated financial need. The scholarship was established by the wife of former Massachusetts Governor Foster Furcolo in honor of his outstanding efforts to facilitate the education of worthy students.

#### *George Sumner Gaunt Endowed Memorial Scholarship*

One or more scholarships are awarded annually from a fund established in memory of Lt. George S. Gaunt '68 by his classmates and fraternity brothers. Recipients must be in the junior or senior year, enrolled in the College of Business or Engineering, and have at least a 2.5 cumulative GPA. Preference is given to students working with youth development.

#### *Jimmy Geyer Memorial Scholarship*

A scholarship of \$1,000 is awarded to a full-time freshman in the College of Business with a demonstrated financial need. If the student continues to meet the criteria, the scholarship is renewable and will provide financial aid support for the student's four years at the University. The scholarship is funded by the James G. Geyer Memorial Trust, established in 2002, through the generosity of his former classmates, teammates, and friends. Jimmy Geyer was a former wide receiver for Western New England College's first NCAA Division III football team in 1981. Jimmy was a standout football player for four years at Western New England College, and subsequently a wonderful husband and father. For those fortunate enough to know Jimmy, he was truly a loving, honest, and honorable

friend. Jimmy passed away in 2001, and though his voice is quiet, his spirit echoes still.

#### *Gilbert Matching Grant Program*

The Commonwealth of Massachusetts annually provides the University with funds to assist full-time Massachusetts undergraduate students with demonstrated financial need. Awards may range from \$200 to \$2,500 per academic year.

#### *Harley B. Goodrich and Francis A. Johnson Endowed Memorial Scholarship*

Awards are made to students who have outstanding records either as undergraduates or in the School of Law. This scholarship was established in memory of Harley B. Goodrich '27 BBA/'42 LL.B., secretary of the Board of Trustees of Western New England College from 1942-1974, by members of Pi Tau Kappa fraternity and Western New England College trustees, and Francis A. Johnson. Mr. Johnson earned the Bachelor of Business Administration in Accounting from Western New England College in 1959 and the Master of Business Administration in 1961.

#### *Jeffrey and Teresa Gurski Scholarship*

A scholarship of a minimum of \$1,000 is awarded to a full-time freshman with demonstrated financial need who is enrolled in the College of Arts and Sciences. Preference is given to students majoring in Mathematics. The recipient must have a cumulative high school GPA of 3.0 or higher and have demonstrated financial need. The scholarship is awarded starting in the freshman year and can be renewed for the student's subsequent undergraduate years at the University provided he or she maintains a GPA of at least 3.0 and continues to have financial need. If the student continues to meet the criteria, the scholarship is renewable and will provide financial aid support for the student's time at the University. The scholarship was established through the generosity of Jeffrey M. Gurski and Teresa M. Gurski. Jeffrey received his Bachelor of Arts in Mathematics in 1981 and his wife, Teresa, received her Bachelor of Science in Business Administration in Accounting in 1984.

#### *Hambro Family Endowed Scholarship*

This scholarship is awarded to any student of Western New England University who has demonstrated financial need. The scholarship was established through the generosity of University Trustee Bruce F. Hambro '74 BSBA and his wife, Marjorie.

#### *Hampden Bank Endowed Scholarship*

Scholarships are awarded to underrepresented undergraduate students from Springfield, MA, who have demonstrated financial need. The endowed fund was established with contributions from Hampden Bank at the generous suggestion of University Trustee Thomas R. Burton '70 BSBA, president of Hampden Bank. The scholarship assists Western New England University in attracting a diverse student body of deserving students.

#### *Alison Mary Harris Endowed Memorial Scholarship*

Awards are made to juniors and seniors in the College of Business. This scholarship was established in memory of Alison Mary Harris '89 BSBA by her classmates, friends, and family.

#### *Elinor C. Hartshorn Endowed Scholarship*

This scholarship is awarded to a student with demonstrated financial need who has been selected through a Western New England University exchange program either to study abroad or to study at American University in Washington, DC. This endowed fund was established through the generosity of Elinor Hartshorn, Ph.D.,

friends, and colleagues. Dr. Hartshorn retired from the full-time faculty of Western New England College in 1992 after a distinguished career teaching government and political science. This endowed scholarship fund reflects her belief that an opportunity to study in the unique environment of Washington, or to go abroad for a semester, enriches students' lives and broadens their understanding of the world in which they live. A Western New England University education provides a valuable preparation for this experience.

#### *Carl R. Hellstrom Endowed Scholarship*

Scholarships of varying amounts are available to either full-time or part-time students. The scholarship was established by Carl R. Hellstrom in 1961. Applicants must be students of good standing in the University or incoming freshmen. Selection of candidates is made on the basis of academic aptitude and achievement plus qualities of good character, personality, and potential leadership.

Financial need is not the controlling factor in the selection of the recipients, but such need will determine the amount of the scholarship to be granted. Awards are for one year only, but recipients may apply for renewal and be considered on the same basis as new applicants. The number and amount of grants in any year is dependent upon the income available from the fund. Preference is given to students whose parents are associated with Smith Wesson, Inc.

#### *John Henri Memorial Scholarship*

Scholarship support is available to an undergraduate student enrolled in any program of the University who has a demonstrated financial need. If the student continues to meet the criteria, this scholarship is renewable for the student's subsequent years at the University. This scholarship was established through the generosity of John A. '77BSBA and Diane Dame.

#### *Beaumont A. and Winifred S. Herman Endowed Scholarship*

Scholarships of \$500 or more may be awarded to students beginning their senior year. They must have a GPA that, if continued, would qualify them to graduate magna or summa cum laude. This scholarship was established in honor of Beaumont A. and Winifred S. Herman. Dr. Herman was president of Western New England College from 1955 to 1976.

#### *Peter W. Hess Annual Memorial Scholarship*

A scholarship is to be awarded to a senior in the College of Business who has a minimum GPA of 3.0; who is from the greater Springfield area; and has financial need. This scholarship was generously created by Peter Hess's family, colleagues, and former students in memory of his over thirty years of commitment and dedication to Western New England.

#### *Dr. Nancy Hoar Endowed Memorial Scholarship*

This scholarship is available based on financial need to an undergraduate student in the College of Arts & Sciences and is renewable provided the student continues to meet the criteria of the scholarship. Nancy Hoar was a faculty member at Western New England for 28 years, teaching in the Department of English and Communication; her infectious love of language and logic, as well as her generous and caring spirit, made her one of the most beloved teachers on the Western New England campus until her sudden passing during the 2009-2010 academic year. Nancy received her Master of Business Administration from Western New England in 1984. Her husband Marion Hoar, as well as her colleagues and former students, established this scholarship in her memory.

*Dr. Robert H. Holdsworth Biology Endowed Merit Scholarship*

A scholarship is available beginning in the first semester to a full-time freshman majoring in either Biology, Forensic Biology, or Pre-Pharmacy. The recipient must have a combined SAT score of at least 1100 (math/verbal) and have shown by his/her high school record a strong aptitude in biology, chemistry and mathematics. This scholarship is renewable for the recipient's subsequent years at Western New England provided the recipient continues to satisfy the criteria of the scholarship and maintains a cumulative grade point average of 3.0 or better. This scholarship was generously created by Dr. Holdsworth's wife, Elaine, and his colleagues, former students, and family members to honor his dedicated service to Western New England College and the study of Biology. In the early 1970's "Dr. Bob" Holdsworth was originally hired by Western New England to create the Biology program and for thirty-seven years he provided insight and knowledge to eager young scientific minds. After his many years of hard work and devotion, Dr. Holdsworth retired in the spring of 2010 and was honored with the title of Professor Emeritus.

*International Student Scholarship*

A limited number of \$9,000 International Student Scholarships are offered each year to undergraduate freshmen and transfer students. The scholarships are renewable if the recipient maintains at least a 2.7 Western New England University GPA, satisfactory academic progress, and full-time status. The Admissions Office selects recipients who have an outstanding academic record and who have at least a 213 TOEFL score (550 on the paper-based TOEFL test).

*Jacqueline Stratton Isenburg Endowed Memorial Scholarship*

Scholarships are awarded to full-time freshmen who have physical or learning disabilities and demonstrated financial need. Preference is given to students from New Hampshire and Vermont. The scholarship is renewable for the students' undergraduate careers at Western New England University. This endowed scholarship was created by family and friends in loving memory of Jacqueline Stratton Isenburg, who passed away March 24, 2006. Mrs. Isenburg graduated from Western New England College in 1986, having earned the degree of Bachelor of Science in Business Administration.

*Thomas Jefferson Endowed Scholarship*

This scholarship is awarded to returning full-time students majoring in International Studies. Should there be no eligible International Studies majors in a given academic year, Political Science majors with an interest in international affairs may be considered. A committee drawn from the faculty of the Department of History and Political Science annually determines the recipient(s) of the scholarship. Academic excellence (minimum 3.5 GPA in the major and overall at the time of selection), financial need, and personal qualities reflecting Jeffersonian principles, including integrity and commitment of service to others, represent the criteria of selection. This award is renewable upon demonstration of meeting the established criteria for the scholarship. This scholarship is in addition to whatever other need-based aid the student has received.

The scholarship was established by Dr. Vladimir Wozniuk, Western New England University professor of Political Science and director of the International Studies program, in tribute to U.S. President Thomas Jefferson, who had served as minister to France and as the first U.S. secretary of state before his presidency. Recipients are encouraged to replenish the endowed fund to help it grow once they acquire the financial means.

*Carl E. and Esther S. Johnson Endowed Scholarship*

Scholarships of varying amounts are awarded to undergraduate students from a fund established by Mr. and Mrs. Carl E. Johnson.

Preference is given to children of employees of the Acme Chain Corporation of Holyoke, MA, and to students from the Holyoke-Springfield area.

*Father Christopher Johnson, O.P., Endowed Scholarship*

Scholarships of varying amounts are awarded to Hispanic students with demonstrated financial need who maintain a Dean's List average in their chosen field of study. This scholarship was established by Western New England College Trustee C.W. Gilluly and his wife, Marny, in honor of Father Christopher Johnson, who served Western New England College as a trustee from 1980 to 1997.

*William and Patricia Jolicoeur Endowed Commuter Student Scholarship*

Scholarships in the amount of one-half tuition will be awarded to two full-time commuter students. Recipients must demonstrate financial need and be residents of Holyoke, Chicopee, or West Springfield, MA. The fund, established by William Jolicoeur '75 MBA and his wife, Patricia, requires that the recipients have some exposure to free-market ideas during the course of their education at Western New England University.

*William and Patricia Jolicoeur Greenfield Community College Transfer Student Endowed Scholarship*

This scholarship is awarded to a student or students transferring to Western New England University for full-time undergraduate study from Greenfield Community College (GCC). The students must have completed the equivalent of at least one full semester (12 credits) at GCC. Preference is given to students who declare a major in Economics or who declare an intent to minor in economics. For students declaring a major in Economics, they could be also be majoring in another field. For students who have declared an intention to minor in economics, they must actually declare the minor no later than the end of their first semester at Western New England University and must have completed some coursework toward the minor no later than the end of their second semester at the University, or the scholarship cannot be renewed for the students' second year at the University. If in a given year no transfer students from GCC enroll with a declared Economics major or a declared intent to minor in economics, secondary consideration will be given to GCC transfer students majoring, in order of preference, in business, or in any other discipline at Western New England University. Preference will be given to a student with a GCC cumulative GPA of at least 3.0. The scholarship is renewable if the student maintains a minimum cumulative GPA of at least 3.0 throughout their college education. Demonstrated financial need is not a mandatory factor in awarding the scholarship. Scholarship recipients must be exposed to free market ideas during the course of their study at Western New England University. As appropriate, the scholarship could be awarded in conjunction with other scholarships such as the Phi Theta Kappa Scholarship or the Transfer Scholarship. This endowed scholarship was established through the generosity of William and Patricia Jolicoeur. Mr. Jolicoeur earned his MBA at Western New England College in 1975 and had demonstrated a passion for the discussion and dissemination of economic concepts for undergraduate students.

*Thomas K. Kamp Memorial Scholarship*

A scholarship of one-half tuition is awarded annually to a senior in the College of Business. Preference is given to a veteran or the son or daughter of a veteran. The scholarship was established in memory of Thomas Keith Kamp '68 BSBA, who was killed in action in Vietnam on November 17, 1969.

*Terry L. Kendall Endowed Memorial Scholarship*

This scholarship is awarded to an entering full-time freshman enrolled in the College of Business. The recipient must be a resident of Springfield, MA, have demonstrated financial need, and have a cumulative high school GPA of at least 3.0. The scholarship is renewable for an additional three years provided that the student maintains a Western New England University GPA of at least 3.0, continues to have demonstrated financial need, and remains enrolled in the College of Business. When there is more than one candidate for the scholarship, financial need will be the deciding factor in its award. This scholarship was established by Jennifer and Bryan Kendall in loving memory of their father, a 1968 graduate of Western New England College and a member of the University's Board of Trustees. Terry Kendall was a kind, generous, thoughtful person whose qualities touched many people. During his time on the Board of Trustees, he was very interested in giving back to the institution that had helped him succeed. As a result of his education at Western New England, Mr. Kendall went on to earn an MBA and establish a distinguished career in the financial services industry. Prior to his death, he was president of CIGNA Corporation, based in Philadelphia. Mr. Kendall would be very proud of those individuals who go on to achieve greatness as a result of this scholarship. Terry Kendall passed away June 20, 2005, at age 58. He will be forever in the hearts of his family.

*Steven and Elaine Kitrosser Industrial Engineering Endowed Scholarship*

A scholarship is available to an undergraduate student majoring in Industrial Engineering beginning in the student's freshman year. The student must have financial need and a minimum GPA of 3.0 in order to qualify for this award. This scholarship is renewable for the student's subsequent years provided the student is still an industrial engineering major, maintains a 3.0 or better GPA and continues to have financial need. This scholarship was generously established by Steven P. and Elaine Kitrosser. Steven received his Bachelor of Science in Industrial Engineering in 1966 and his Master of Business Administration in 1970, both from Western New England. He is the former Chairman of InPhase Technologies, Inc. and, has over 35 years of experience in the data storage industry. Steven, who is currently the Chair of the College of Engineering's Industrial Engineering Advisory Board, was inducted into the Engineering Hall of Fame in 2002 for his outstanding contributions to the advancement of the computer storage industry and is currently a member of the Western New England University Board of Trustees. Steven is also one of the founders of Quinta Corporation and an early executive of Maxtor Corporation. Steven and his wife, Elaine, live in San Jose, CA.

*Phyllis M. Knecht Endowed Scholarship*

This scholarship was originally funded by the sons of longtime Western New England employee Phyllis M. Knecht and their families, and by the President of Western New England. Mrs. Knecht's many colleagues and friends then contributed generously to the fund so that it could become endowed and serve as a permanent tribute to this remarkable woman.

This scholarship is awarded to a full-time freshman or transfer student from western Massachusetts, and preferably from Ludlow, MA, who has demonstrated financial need and has achieved solid academic achievement in high school or in college. It is renewable when the student continues full-time study at the University and maintains a cumulative GPA of at least 3.0.

Phyllis M. Knecht was in her 33rd year of service upon her retirement from Western New England College on May 3, 2002. From 1970-75, she was the secretary to the director of Food Services; from 1975-76,

secretary to the director of Development; 1976-1978, secretary to the academic vice president; 1978-98, secretary to the president of the University; 1998-2002, assistant to the president.

Mrs. Knecht has been long respected, recognized, and admired by the entire University campus as a devoted employee who has worked assiduously throughout her tenure.

*Carol Kowalski Endowed Scholarship*

This scholarship is awarded to a full-time undergraduate student in the Colleges of Arts and Sciences, Business, or Engineering starting in his or her sophomore year. The student must have demonstrated financial need and a cumulative GPA of 2.5 or higher. This endowed scholarship was established in honor of Carol Kowalski by her husband, Dr. Stanley E. Kowalski, dean of the College of Business. Carol initiated the art courses at Western New England and established the University's art gallery. She has taught art classes and curated the art gallery at the University for more than 20 years.

*Dr. Stanley Kowalski, Jr. Endowed Scholarship*

This scholarship is awarded to full-time undergraduate students in the College of Business who have demonstrated financial need. The students must have cumulative high school GPAs of 2.7 or better and must maintain this academic performance at Western New England University for the scholarship to be renewed. Dr. Kowalski served Western New England College for 33 years, beginning his career at the institution teaching courses in quantitative methods and computer information systems from 1973-1976. He was appointed assistant to the president from 1976-1979 and served as dean of the School of Business and professor of quantitative methods from 1979-2006. Among his many accomplishments while at Western New England, Dr. Kowalski led the School of Business' successful efforts to achieve accreditation by AACSB International, the premier accrediting agency for business programs throughout the world. This endowed scholarship was established in his honor by family, colleagues, alumni, and friends, and is a reflection not only of the high regard in which he is held, but also of the tremendous dedication he showed to the students of Western New England.

*David P. Kruger Endowed Scholarship*

A scholarship is awarded with preference for students in the College of Business who have demonstrated financial need. This endowed fund was established through the generosity of David Kruger, colleagues, and friends. Mr. Kruger received his bachelor's degree from Western New England College, graduating with the class of 1968. He earned his master's in Business Administration from Western New England College in 1972. Mr. Kruger has served the campus since 1973, first as director of financial aid, then as controller, and most recently as vice president of finance and administration.

*Alfred and Marian LaRiviere Endowed Scholarship*

This scholarship is awarded annually to students based on demonstrated financial need. It was established by Western New England College Trustee Alfred A. LaRiviere '51 BBA/'95 LLD (Hon) '01 Bacc(Hon) and his wife, Marian.

*Alfred and Marian LaRiviere Endowed Diversity Scholarship*

Scholarships are awarded to students who have demonstrated financial need. To further the University's strategic commitment to foster a campus community that values diversity, preference is given to historically underrepresented or socioeconomically disadvantaged students. This scholarship was established by Western New England College Trustee Alfred A. LaRiviere '51 BBA/'95 LLD (Hon) '01 Bacc (Hon) and his wife, Marian.

*Alfred and Marian LaRiviere Alpha Lambda Delta Endowed Merit Scholarship*

This merit scholarship is awarded to sophomore Alpha Lambda Delta members who have excelled the most academically during their second year, who will complete the sophomore year at the end of the current academic year, and who will return for the junior year at Western New England University. This scholarship was established by Western New England College Trustee Alfred A. LaRiviere '51 BBA/'95 LLD (Hon)/'01 Bacc (Hon) and his wife, Marian.

*Alfred and Marian LaRiviere Endowed Music Scholarship*

This scholarship of \$500 is awarded to an incoming student who commits to participating in one or more University instrumental and/or vocal ensembles throughout his or her first year. This scholarship will be awarded in addition to any other scholarship support, need-based or merit-based, that the student receives from Western New England University. Students must apply for the scholarship through the process defined by the University. The scholarship recipient must remain in good standing with the University throughout his or her first year or forfeit the scholarship. The scholarship is renewable for the subsequent years at the University provided he or she continues to participate in one or more music ensembles and remains in good standing. This scholarship was created through the generosity of Western New England Trustee Alfred A. LaRiviere and his wife, Marian. Al LaRiviere, a devoted supporter of Western New England, graduated with the class of 1951 and received two honorary degrees from Western New England: an Honorary Doctor of Law in 1995, and an Honorary Bachelor of Science in 2001 that was offered to alumni who had received their original undergraduate degrees when the University existed as the Springfield Division of Northeastern University. Through the music scholarship, the LaRivieres seek to help foster the artistic life of the Western New England University community.

*Leadership Grant*

Leadership Grants are awarded to matriculating, full-time freshmen and transfer students who have financial need and who have demonstrated their leadership abilities through prior high school, college, and community experiences. The grants are for varying amounts up to \$3,000 per year and will be renewed if the recipient participates in leadership activities at Western New England University and demonstrates financial need. In order to be considered for the grant, students must submit the necessary forms to be considered for need-based financial aid and complete a Leadership Grant application.

*The Agnes M. Lindsay Trust Scholarship*

Scholarship grants are awarded to students with demonstrated financial need from rural New England communities in Maine, Vermont, New Hampshire, or Massachusetts. This scholarship opportunity is made possible through contributions from The Agnes M. Lindsay Trust.

*Richard T. Lovett and Gertrude R. Lovett Endowed Scholarship*

Scholarships of varying amounts are awarded to undergraduate students based on demonstrated financial need from a fund established by Richard T. Lovett '34 BBA and Gertrude R. Lovett.

*Martin and Roberta Lower/Ludlow Textiles Endowed Scholarship*

Scholarships of varying amounts are awarded based on demonstrated financial need and demonstrated academic ability. Preference is given to descendants of former employees of Ludlow Textiles Company, Inc., and to students who are Ludlow, MA, residents. This

scholarship is provided from a fund established by Western New England College Trustee Martin A. Lower, a Trustee Emeritus, and his wife Roberta.

*Anthony Lucki Scholarship*

The scholarship is awarded to an undergraduate or graduate student enrolled in any of the Colleges of Arts and Sciences, Business, Engineering or the School of Law at the University, full-time or part-time, who has demonstrated financial need and cumulative GPA of 3.0 or better. It is renewable provided the recipient continues to meet the criteria.

*Kathryn L. Luongo Endowed Memorial Scholarship*

A merit scholarship is available to a New England resident who has a minimum of a 3.0 GPA. Preference is given to a student who participated in a varsity sport and was able to maintain a minimum GPA of a 3.0 while in high school. The student does not have to participate in athletics while in University. The scholarship is awarded starting for their freshman year and can be renewed for the student's subsequent undergraduate years at the University, provided he or she maintains a GPA of at least 3.0. This scholarship was generously created by Peter C. Steingraber, Trustee and Law Alum of the University, in memory of Kathryn L. Luongo. Mr. Steingraber received his Juris Doctor degree from Western New England College in 1984.

*Kenneth A. MacLeod Memorial Scholarship*

A scholarship of varying amounts, established by the Sigma Beta Tau Honor Society in memory of Dr. Kenneth A. MacLeod, is awarded annually to the student who received the highest GPA in a regular freshman engineering program. The student must be enrolled as a sophomore in an engineering curriculum at the time of the award.

*Harry and Mollie Marcus Scholarship*

A scholarship of \$1,000 is awarded to a full-time freshman with demonstrated financial need who is enrolled in the College of Business. If the student continues to meet the criteria, the scholarship is renewable and will provide financial aid support for the student's four years at the University. The scholarship was established through the generosity of Mollie Marcus in memory of her husband, Harry. The couple were the founders of East Coast Tile Imports, Inc., based in Ludlow, MA.

*Massachusetts Part-Time Grant*

The Part-Time Grant program is a grant assistance program that provides need based financial assistance to part-time (6-11 credits) undergraduate students who reside in Massachusetts.

*MASSPOWER Endowed Scholarship*

This scholarship is awarded to a freshman from Springfield, MA, majoring in engineering. The award is based on demonstrated financial need and demonstrated academic ability. Preference is given to students who have exhibited leadership skills and reside in Indian Orchard, MA.

*Joseph A. Mastrangelo Endowed Scholarship*

A scholarship is awarded annually to a person taking more than the normal academic schedule (three courses) as a nontraditional student. This scholarship was established by Joseph Mastrangelo '77 BBA.

*Horace and Gertrude McCrea Endowed Scholarship*

Scholarships are awarded annually to undergraduate students from a fund established by Horace O. McCrea '23 BCS. Preference is given to students in the College of Business.



*James H. McGraw Endowed Scholarship*

Scholarships are awarded annually to an Electrical Engineering student who demonstrates financial need.

*Raymond and Shirley S. Meyers Endowed Scholarship*

This scholarship is available to students who have demonstrated financial need and who are graduates of high schools in the greater Holyoke-Springfield, MA, area. This fund was established by the children of Raymond '51BBA/'64MBA/'01Bacc(Hon) and Shirley Meyers, in honor of their parents.

*Jeanne Marie Milkay Endowed Memorial Scholarship*

A scholarship is awarded to an undergraduate student majoring in English who has demonstrated financial need. Judith A. and Ronald J. '63 BSME Milkay established this scholarship in memory of their daughter, Jeanne Marie, an English major who graduated from Western New England College in 1984. Jeanne Marie Milkay passed away April 15, 1986.

*Wah Sing and Christine Ng Annual Scholarship*

A \$1,000 annual scholarship is available beginning in the freshman year to a student enrolled in the College of Engineering with demonstrated financial need. The recipient must be majoring in Electrical Engineering. This scholarship is renewable for the duration of the recipient's time at the University provided the student continues to meet the criteria. This scholarship was generously created by Western New England University Trustee, Wah Sing Ng and his wife Christine. Wah Sing Ng received a Bachelor of Science in Electrical Engineering in 1968 and a Master of Business Administration in 1975, both from Western New England University. He is currently the president of NG Planning, LLC. Wah Sing and his wife Christine live in New Jersey.

*Northampton Junior College Alumni Association Opportunity Endowed Scholarship*

This scholarship is awarded to a student enrolling at Western New England University who has earned an associate's degree from a two-year college. The student can be pursuing a degree in any program of the University and must have demonstrated financial need. This endowed scholarship was made possible through the generosity of Kenneth D. '63 BBA/G'66 MBA, Joan Cardwell, and the Northampton Junior College Alumni Association.

*Lawrence F. and Myra T. O'Brien Endowed Memorial Scholarship*

A scholarship is available to an undergraduate student or students from a fund established by former National Basketball Association Commissioner Lawrence F. O'Brien L '42 LLB in memory of his parents.

*Francis S. and Ruth M. Oleskiewicz Endowed Scholarship*

One half of available funds will be available to graduates from Marian High School located in Framingham, MA. The recipient will be the applicant with the highest grade point average, at least exceeding 3.0 over the last three years of high school. The remaining one half will be awarded to a graduate of Chicopee High School who also graduated from St. Stanislaus School in Chicopee, MA, and who has maintained at least a grade point average of 3.0, with the award going to the applicant with the highest average. The scholarship recipients can be enrolled in any of the undergraduate divisions of the University or enrolled in a master's program in the College of Engineering or enrolled in the School of Law. Francis Oleskiewicz is a trustee emeritus of the University and a 1961 graduate of the School of Law.

*Earl H. Paine Endowed Memorial Scholarship*

Awards are made annually from a fund established in memory of Earl H. Paine '27 BCS/'65 DCS(Hon), who served as treasurer of Western New England College from 1937-1965 and on the Board of Trustees from 1951-1970.

*Parents Endowed Financial Aid Fund*

Scholarships are awarded from a fund established by the Parents Association for students with demonstrated financial need.

*The Pellegrini Family Endowed Scholarship*

Scholarships are awarded to full- or part-time students with demonstrated financial need. Students can be enrolled in any of the Colleges of the University or the School of Law. At least 25 percent (25%) of the scholarship amount each year is to be awarded to an evening student(s) and at least 25 percent (25%) of the scholarship amount each year is to be awarded to a law student(s). The remaining awards may go to any student with financial need that meets the remaining criteria. This scholarship was established through the generosity of Gerard L. Pellegrini L '57 JD.

*The PeoplesBank Endowed Scholarship*

A scholarship is available to employees or children of employees of PeoplesBank based on financial need. Should there not be a student that meets the above criteria, this scholarship shall be awarded to a resident of either Hampden or Hampshire counties in Massachusetts. This scholarship is renewable provided the recipient continues to meet the criteria of the scholarship. This scholarship was generously created through the support of PeoplesBank. PeoplesBank was established in 1885, and is one of western Massachusetts oldest and most respected community Banks. PeoplesBank has been deeply rooted in the community since its start and has consistently looked for ways to help support the Pioneer Valley and its residents find ways to make this area a great place to live, work, and learn.

*People's United Bank Endowed Scholarship*

Scholarships are awarded to either full- or part-time undergraduate students for their sophomore year, with preference given to students who are residents of the four western Massachusetts counties of Hampden, Hampshire, Franklin, or Berkshire. Preference is given to employees of People's United Bank, or children or dependents of People's United Bank employees. Students can be in any of the Colleges of Arts and Sciences, Business, or Engineering. Each scholarship recipient must have demonstrated financial need; a cumulative Western New England University GPA of 2.7 or better; and have demonstrated leadership, either through involvement in Western New England University organizations or through community service for organizations in western Massachusetts. The scholarship can be renewed for students' junior and senior years provided they continue to meet the scholarship criteria. The endowed fund was established with contributions from People's United Bank at the generous suggestion of University Trustee Timothy P. Crimmins Jr., Massachusetts president of People's United Bank, who received his undergraduate degree from Western New England College in 1970; and University Trustee Frank P. Fitzgerald, former chairman of the board of The Bank of Western Massachusetts, now People's United Bank, Massachusetts, who received his undergraduate degree from Western New England College in 1968 and his law degree from the School of Law in 1973.

*Linda and James Peters and Family Endowed Scholarship*

A scholarship is awarded to an undergraduate student of the University, with preference for a student who graduated from Monson High School in Monson, MA. The recipient must have a

cumulative high school GPA of 3.0 or higher and demonstrated financial need. The scholarship is awarded starting for the freshman year and can be renewed for the student's subsequent undergraduate years at the University, provided he or she maintains a GPA of at least 3.0 and continues to have financial need. This endowed scholarship was created through the generosity of Linda and James Peters. Dr. Linda L. Peters earned her Master of Business Administration from Western New England College in 1996.

#### *Phi Theta Kappa Scholarship*

An unlimited number of \$7,000 scholarships are awarded each year to full-time transfer students who are members of Phi Theta Kappa, the two-year college honor society. To be eligible, students must matriculate immediately following completion of their two-year college degree. The minimum college GPA is 3.5 and an A.A., A.S., A.A.S., or Canadian equivalent is required. Students must also be U.S. citizens, and they cannot have previously received a bachelor's degree. Scholarship is renewable for a second year of full-time study if a 2.7 Western New England University GPA and satisfactory academic progress are maintained.

#### *Thomas and Cynthia Picknally Scholarship*

A scholarship of a minimum of \$1,500 is awarded to a full-time freshman with demonstrated financial need who is enrolled in the College of Business. Preference is given to participants in the University's combined BSBA/MBA program. If the student continues to meet the criteria, the scholarship is renewable and will provide financial aid support for the student's time at the University. The scholarship was established through the generosity of Thomas J. Picknally '79 BSBA.

#### *Herman E. and Maud K. Pihl Endowed Scholarship*

This scholarship is granted to undergraduate students from a fund established by Mr. and Mrs. Herman E. Pihl. Preference is given to children of employees of the Acme Chain Corporation of Holyoke, MA, and to students from the Holyoke-Springfield, MA, area.

#### *Pioneer Valley Mechanical Trades Endowed Scholarship*

A scholarship is available to a student consistent with the financial need policies of the Western New England. There is a preference for a student who resides in one of the four western Massachusetts counties – Berkshire, Franklin, Hampden, or Hampshire, is majoring in Engineering and who is currently enrolled with financial need, in this order. This scholarship was generously established through the generosity of the Pioneer Valley Mechanical Trades.

#### *Charles and Ann Pollock Endowed Scholarship*

This merit scholarship is awarded with preference for a currently enrolled full-time undergraduate student who has not yet received a Western New England University scholarship. The merit criterion is defined as a Western New England University cumulative GPA of 3.0 or better. This scholarship was established by Charles and Ann Pollock. Charles has served the University since 1977, most recently as vice president for Enrollment Management.

#### *Presidential Scholars Award*

Merit scholarships based on outstanding high school academic achievement are awarded to full-time students. Awards are renewable based on achieving and maintaining a 2.7 cumulative GPA, satisfactory academic progress, selective service status, if required, and full-time status.

#### *R. Joseph Racine Endowed Scholarship*

Scholarships are awarded annually to students based on financial need from a fund established by retired Professor R. Joseph Racine.

#### *Kenneth M. Rickson Endowed Scholarship*

Scholarships are awarded to undergraduate students in the College of Business who have demonstrated financial need. This scholarship was established by Kenneth M. Rickson, who earned his Bachelor of Business in Accounting from Western New England College in 1975. Mr. Rickson has been a strong supporter of the University and has served as a trustee from 1996 to the present.

#### *Rizzi Family Scholarship*

A scholarship of \$1,000 is awarded to a full-time freshman with demonstrated financial need who is enrolled in the College of Business. If the student continues to meet the criteria, the scholarship is renewable and will provide financial aid support for the student's four years at the University. This scholarship was established through the generosity of Matthew A. Rizzi '95 BSBA.

#### *Marc A. Rosenberg Endowed Scholarship*

This scholarship is awarded to a full- or part-time undergraduate student in the College of Business who has a cumulative high school GPA of 3.0 or higher and demonstrated financial need. The scholarship is awarded starting for their freshman year and can be renewed for the student's subsequent undergraduate years at the University, provided he or she maintains a GPA of at least 3.0 and continues to have financial need. This endowed scholarship was created through the generosity of Marc A. Rosenberg, who earned his Bachelor of Science in Finance degree in 1980 and his Master of Business Administration degree in 1982.

#### *Sattler-Goodrich Endowed Scholarship*

A scholarship fund in memory of Allan R. Sattler '59 BBA/'61 MBA has been established by members of the Pi Tau Kappa fraternity and the Epsilon Phi Sigma/Tau Epsilon Phi fraternity. Awards are made to undergraduate students who have outstanding academic records.

#### *Serafino Family Endowed Scholarship*

A scholarship is awarded to a full-time undergraduate student in the College of Arts and Sciences who has demonstrated financial need. Preference is to be given to students who participate in extracurricular activities devoted to the arts. This scholarship is meant to supplement a student's expenses and it is the donor's intent that the award recipient and/or the recipient's family be expected to provide some contribution to the recipient's education expenses. The scholarship is awarded starting for their freshman year and can be renewed for the student's subsequent undergraduate years at the University, provided he or she continues to have financial need. This scholarship was created through the generosity of Michael A. and Patricia J. Serafino. Both, Michael and Patricia graduated from Western New England College in 1977. Michael received a Bachelor of Science in Business Administration and Patricia received a Bachelor of Arts in Sociology.

#### *John F. Shaw Endowed Scholarship*

Scholarships of various amounts are available to students from a fund established in 1973 by John F. Shaw. Preference is given to students in the greater Springfield area.

#### *J. Resler Shultz and Dorothy P. Larson Endowed Scholarship*

Scholarships of varying amounts are awarded with preference given to residents of eastern Pennsylvania or western Massachusetts. Mr.

Shultz was the first director of development at Western New England College and served from 1958 until 1973. Mrs. Dorothy P. Larson was his assistant. They worked diligently to raise funds for the first six buildings on the new campus of Western New England College.

#### *Sibling Discount*

This is a \$1,000/year discount offered to each sibling when a family has more than one full-time undergraduate child attending Western New England University in a given year. Each student receives a \$1,000 credit applied to the tuition billing. The discount only applies to sibling relationships and is only available to full-time undergraduate students.

Please notify Enrollment Services each year if qualified.

#### *Sigma Beta Tau Scholarship*

A scholarship of varying amounts is awarded annually by the Sigma Beta Tau Honor Society to the student who has received the highest GPA in a regular sophomore engineering program. The student must be enrolled as a junior in an engineering curriculum at the time of the award.

#### *Evan R. Simpson Scholarship*

A \$1,000 scholarship is awarded annually to an incoming freshman based on financial need. Evan R. Simpson received his Bachelor of Science in Mechanical Engineering from Western New England College in 1961. Evan was a past president of the Epsilon Phi Sigma fraternity and a past president of the Alumni Association. He was a recipient of the Alumni Association's Special Award for Service and the Silver Letter Award. Evan worked for James River Graphics for 35 years retiring in 1988 as manager of environmental affairs. Evan was married for 61 years to Gladys M. Simpson. Together they had three sons, William, Scott, and David. This scholarship was generously created by Evan's family and friends in memory of his longtime love of and commitment to Western New England.

#### *William and Iona Sleith Endowed Scholarship*

This scholarship of varying amounts is for minority students with demonstrated financial need. These scholarships will be in addition to whatever gift award has been made by the University based on need. William Sleith, alumnus of the Class of 1944, served Western New England College as corporator and trustee from 1958 until his death in 1996. Mr. Sleith's generous gifts to the Western New England over the years attest to his commitment to the University and to his belief that minority students are a vital constituency of the University community.

#### *Stanley O. Smith Endowed Memorial Scholarship*

Scholarships of varying amounts are awarded annually to accounting majors with demonstrated financial need and who are on the President's or Dean's List. The fund is in memory of Stanley O. Smith, president of the first graduating class (1922) and acting president of Western New England College (1954-1955).

#### *James W. Stacy, Class of 2003, Endowed Memorial Scholarship*

A scholarship is awarded to an undergraduate student majoring in Psychology who has demonstrated financial need. This endowed scholarship fund was established in loving memory of James W. Stacy by his family, members of the Class of 2003, friends, and teachers. James Stacy, who died January 25, 2003, was a bright and dedicated student who had a wonderful way of making people laugh. He took his studies seriously and in his sophomore year earned membership in Psi Chi, the national psychology honor society. He also worked hard to help finance his education, helping in the

Department of Psychology as a work-study student and working other jobs at night and on weekends. James exemplified the spirit and dedication that most of us aspire to in our lives. He is deeply missed.

#### *Earl S. and Shirley M. Stahl Endowed Memorial Scholarship*

This scholarship was established by the family of Earl and Shirley Stahl. Mr. Stahl '53 BBA was the founder of Dielectrics Industries, Inc. in Chicopee, MA. As long as the company remains a family-held enterprise, preference in awarding the scholarship will be given to dependents of Dielectrics Industries employees. Should the company be sold, the scholarship will be open to a broader pool of candidates. One scholarship will be awarded each year. Recipients must be from the Pioneer Valley in the greater Springfield-Hartford area. Priority will be given to undergraduates enrolled in the College of Engineering with secondary consideration given to undergraduates majoring in Management in the College of Business. The award can be based on financial need or merit, with financial need being the deciding factor when there is more than one candidate.

#### *Steerage Rock Endowed Scholarship*

Scholarships are awarded to full-time students in the College of Business who demonstrate strong academic achievement and financial need. Recipients must reside in Brimfield, MA, or one of the neighboring towns of Holland, Monson, Wales, or Warren. The annual award is normally a minimum of \$10,000, but is based on the recipients' demonstrated financial need. Available to incoming freshman, the initial award is renewable for an additional three years provided that the student remains academically strong, continues to demonstrate financial need, and is enrolled as an undergraduate in the College of Business. This endowed scholarship was established by a Class of 1973 alumnus of the School of Business.

#### *Jean C. Sterling Endowed Memorial Scholarship*

This scholarship is available to undergraduate students with demonstrated financial need. The scholarship fund was established in memory of Jean Cameron Sterling '46 BBA by her husband, Esmond E. Sterling. Mrs. Sterling was vice president of finance and secretary to the board of the Dexter Corporation, based in Windsor Locks, CT.

#### *Kenneth M. Stratton Memorial Endowed Scholarship.*

The scholarship is awarded to either undergraduate or graduate students who are working, have financial need, and are not receiving substantial tuition reimbursement from their employer. Students must be pursuing a degree in one of the following business majors, listed in order of preference: 1) Management; 2) Marketing; 3) any other business major. Preference is given first to students from western Massachusetts, second to students from any other area of Massachusetts, third to students from New England. This scholarship was established in memory of Kenneth M. Stratton, '75 BBA, by his family and friends. Ken earned his Bachelor of Science in Management through the Evening Division while working full time and raising a family. He was a warm, caring, and charismatic father and business person who started his business and marketing career with S.C. Johnson Wax Co., later becoming vice president of marketing and sales for Richco Products, Inc., of Springfield, MA.

#### *Stone Family Scholarship*

A \$1,000 scholarship is available to an undergraduate student beginning in their freshman year based upon financial need. This scholarship is renewable for the student's subsequent years at the University provided the student continues to have financial need. This scholarship was generously created by Peter B. Stone. Peter currently is the president and founder of P.B. Stone Associate, Inc., which provides merger and acquisition advisory services for privately held businesses. He resides in Naples, FL.

*Student Senate Endowed Scholarship*

This scholarship is awarded to a sophomore or junior in his or her spring semester who will be a returning student in the fall and who has an overall cumulative Western New England University GPA of at least 3.0. The student must have demonstrated financial need. The student also needs to have demonstrated and continue to demonstrate leadership qualities and service to a University organization or to the community through a University affiliation. This scholarship has been established with the proceeds of the sale of the Western New England College Afghan, developed by the Student Senate.

*Kevin R. Sullivan Endowed Memorial Scholarship*

A scholarship fund in the memory of Kevin R. Sullivan '81 BSBA was established by his family and friends. Awards are offered annually to full-time students who have demonstrated financial need and above-average academic performance. Preference is given to handicapped students and students entering their junior year.

*Roger J. and Catherine G. Sullivan Endowed Memorial Scholarship*

A scholarship is awarded annually to an undergraduate or graduate student enrolled in the College of Business who has financial need and is a veteran or the child of veteran. There is a secondary preference for a returning student who while attending school is caring for dependent children who are living in the same household. This scholarship was generously created by the Estates of Roger J. and Catherine G. Sullivan. The Sullivan's two daughters, Dianne Bowden and Maureen Kennelly created this scholarship in remembrance of their parents, Mr. Sullivan was a 1953 graduate from Western New England College and a Veteran of World War II. After graduating from Western New England, Mr. Sullivan was a successful businessman and credited his success with the education he received at Western New England College.

*Philip W. Suomu Scholarship*

A scholarship of \$1,000 is awarded to a full-time freshman with demonstrated financial need who is enrolled in the College of Business. If the student continues to meet the criteria, the scholarship is renewable and will provide financial aid support for the student's four years at the University. The scholarship was established through the generosity of Philip W. Suomu '83 MBA.

*Paul C. and Mary Theilig Endowed Scholarship*

Scholarships shall be awarded to undergraduate students with demonstrated financial need who maintain a cumulative grade point average of at least 3.0. Preference will be given to students from New England.

*The TJX Foundation Scholarship*

A scholarship based on financial need is available to an undergraduate student that is either a child from a single parent household or who is currently raising a family of their own. This scholarship was generously created by the TJX Foundation as part of their mission to provide assistance to disadvantaged women, children, and families.

*Susan Tober Endowed Memorial Scholarship*

A scholarship is awarded annually to a deserving student from a fund established by the Civitan Club of Springfield, MA, in memory of Susan Tober, an active club member. The student must have demonstrated scholastic achievement and financial need. Preference is given to residents of the greater Springfield area.

*Transfer Scholarship*

Merit scholarships are awarded annually to transfer students who enroll with at least 12 transfer credits. For consideration, students must have at least a 3.0 GPA from their previous college. Awards are renewable based on achieving and maintaining a 2.7 cumulative GPA, satisfactory academic progress, and full-time status.

Eligibility for the Phi Theta Kappa and Transfer Scholarships is normally based only on grades for college-level courses, usually referred to as 100-level (or higher) courses. A composite college GPA will be calculated for students who attended more than one college. Students who have at least a 3.5 GPA will usually be awarded a \$7,000 merit scholarship while students whose GPA is 3.00-3.49 will usually be awarded a \$5,000 merit scholarship.

*Brian P. Trelease Endowed Scholarship*

A merit scholarship is awarded to a student in the College of Business from a fund established by University Trustee Brian P. Trelease '67 BBA/'71 MBA. Funding is based on the student attaining Dean's List standing.

*Trowbridge-Brown Endowed Scholarship*

Scholarships are awarded annually to seniors in the College of Arts and Sciences who have the highest GPAs at the end of the junior year. The award is from a fund established by Clara F. Trowbridge and Ruth Trowbridge Brown.

*Trustee Scholarship*

This scholarship is used to assist financially needy students to gain an education and makes numerous awards each year to students who would be unable to attend college without financial assistance. These awards are of varying amounts and preference is given to students with GPAs of 3.0 or above.

*Richard H. Tucker Endowed Memorial Scholarship*

One or more scholarships are awarded annually to deserving undergraduate engineering students. The scholarship is named in memory of Richard H. Tucker '80 BA, and was established by his family.

*Tuition Assistance Grants*

The University, to assist financially needy students to gain an education, makes numerous awards each year to students who would be unable to attend college without financial assistance. These awards are of varying amounts.

*Janice Gruppioni Underhill Endowed Memorial Scholarship*

This endowed scholarship is given to a full-time undergraduate student with demonstrated financial need. Preference is given to students with a physical disability. Should there be no student that meets the above criteria this scholarship has a secondary preference to be awarded to a commuting student. This scholarship was established in memory of Janice by her brother, Thomas A. Gruppioni '77 BSBA.

*Nicholas V. Vanech Memorial Scholarship*

A scholarship is awarded to an undergraduate student who has overcome a significant hardship in life and has financial need. This scholarship was generously created by Dean N. and Denise E. Vanech. Dean is the Chairman and Chief Executive Officer of Olympus Capital Investments, LLC located in New Jersey. Dean received a Bachelor of Science in Business Administration from Western New England University in 1982 and Denise received a

Bachelor of Science in Business Administration from Western New England University in 1984.

#### *M. Rainé Veronesi Endowed Memorial Scholarship*

This endowed fund was created by Professor Emeritus of Mechanical Engineering, Richard R. Veronesi, Class of 1961, and Mara M. Veronesi, Class of 1985, in loving memory of their wife and mother, M. Raine Veronesi, Class of 1986. The scholarship will be awarded to a returning student enrolled in the College of Arts and Sciences who has demonstrated financial need and maintains a cumulative GPA of 3.9 or higher. Preference will be given to a full or part-time female student majoring in Liberal Studies, Psychology, or Criminal Justice.

#### *Richard R and M Raine Veronesi Endowed Mechanical Engineering Merit Scholarship*

This endowed fund was created by Professor Emeritus of Mechanical Engineering, Richard R. Veronesi, Class of 1961, and Mara M. Veronesi, Class of 1985, in recognition of Professor Veronesi's many years of service and devotion to Western New England. The scholarship will be awarded to a student majoring in Mechanical Engineering who has demonstrated financial need and maintains a cumulative and major GPA of 3.9 or higher. The scholarship is renewable provided the recipient continues to meet the scholarship criteria. Richard R. Veronesi taught Mechanical Engineering in the College of Engineering for nearly forty years, receiving the Excellence in Teaching Award in 1998 and attaining the title of Professor Emeritus upon his retirement in 2002.

#### *Dr. Hoyt D. Warner Endowed Memorial Scholarship*

Scholarships are awarded starting in the sophomore year for students majoring in Computer Science or Information Technology who display an interest in assisting their fellow computer science students. The recipients must have demonstrated financial need and a Western New England University GPA of at least 2.7. The scholarship is renewable for students' subsequent years at the University provided they continue to have financial need and maintain a GPA of not less than 2.7. The scholarship was created by family, friends, and colleagues of Professor Hoyt Warner, who taught computer science at Western New England College from 1984 to 1998 and made a strong contribution to the development and growth of the Computer Science program.

#### *Westbank Endowed Scholarship*

This scholarship is awarded to an entering freshman from Hampden County who is enrolled in the College of Business and who has demonstrated financial need and academic promise. The endowed fund was established with contributions from Westbank, at the generous suggestion of Donald Chase '75 BBA, president of Westbank.

#### *Charles R. Pollock Western New England University Academic Achievers Scholarship*

Western New England University annually awards scholarships of varying amounts up to the cost of full tuition to students who are MassMutual Academic Achievers. The scholarship is renewable for up to three additional years of full-time, undergraduate study if at least a 2.70 cumulative GPA is maintained. Selection is based on financial need, high school average, awards and recognitions, community and school involvements, and other considerations.

#### *Western New England University Scholarships*

Scholarships of varying amounts are awarded annually to deserving students who have demonstrated financial need and above-average

academic performance. These awards are made possible by generous gifts from friends and alumni of the University through general scholarship giving.

#### *Mark Philip Willett Memorial Endowed Scholarship*

Annual scholarships are available to part-time students in the College of Engineering who are pursuing an undergraduate degree in Electrical Engineering. Individuals pursuing a concentration in computer engineering will receive special consideration. These scholarships are provided from a fund established by Constance Marie Willett, Ph.D. (MBA 1991) in memory of her brother, Mark Philip Willett (BSCPE 1988). Recipients must have a Western New England University cumulative GPA of 2.7 or higher, or be incoming freshmen. Preference will be given to individuals who possess good character and demonstrated leadership skills, with special consideration given to those who have overcome adversity as well. This award is for one year only; however, if the recipient continues to meet the established criteria, he/she will be considered for renewal on the same basis as new applicants.

#### *Wesley and Frances Wilson Scholarship*

Scholarships of amounts varying from \$200 to \$600 are available to full-time students. At least 10 awards are made each year. Preference is given to students in the greater Springfield, MA, area. The scholarship is funded through a trust established by E. Wesley and Frances Wilson, friends of Western New England University.

#### *The Women's Opportunity Endowed Scholarship*

A scholarship of not less than \$500 will be awarded to a full- or part-time female student, who demonstrates financial need, and who is committed to the pursuit of academic excellence.

#### *Theodore R. Zern First Year Student Endowed Scholarship*

A scholarship is awarded in the spring semester to a full-time freshman with demonstrated financial need and who also attended full-time during the immediately preceding fall semester. The scholarship was created through the generosity of dean of freshman and transfer students Theodore R. Zern and his wife, Roxanne. Dean Zern is the chief architect for the University's First Year Program and was with Western New England College for almost 40 years until his retirement.

#### *Federal Financial Assistance Programs*

The U.S. Department of Education provides financial aid for higher education. The following paragraphs serve as a guide to the six major financial aid programs in the U.S. Department of Education. These programs are available to full-time and part-time undergraduate students.

#### *Federal Pell Grants*

The Pell Grant program is available to undergraduate students demonstrating financial need. Eligible students may receive up to \$5,920 each year. Students may apply for these grants by submitting the Free Application for Federal Student Aid. These forms may be obtained from a high school guidance counselor or at [www.fafsa.gov](http://www.fafsa.gov).

#### *Federal Supplemental Educational Opportunity Grants*

Supplemental Educational Opportunity Grants are available to a limited number of undergraduate students with extreme financial need. These grants range from \$200 to \$4,000 a year.

### *Federal Work-Study*

Part-time student employment is available to many students with financial need. Preference is generally given to applicants having the greatest financial need.

### *Federal Direct Ford Student Loans*

Eligibility for a subsidized loan is based on financial need as determined by the analysis of a Free Application for Federal Student Aid. If a student does not qualify for a need based loan, the student may apply using the same application process and loan limits for an unsubsidized loan. The interest that accrues during periods of enrollment for a subsidized loan is paid by the federal government. The interest that accrues during periods of enrollment for an unsubsidized loan is paid by the student. Application can be made by completing the Free Application for Federal Student Aid. Freshman students may borrow up to \$3,500 per year, sophomores may borrow up to \$4,500 per year, juniors and seniors may borrow up to \$5,500 per year. All undergraduate students may borrow up to an additional \$2,000 in an unsubsidized loan. Graduate students may borrow up to \$20,500 per year. The total amount that undergraduates may borrow is \$31,000, while the total for graduate students is \$138,500 (including undergraduate loans). First and second year independent students may borrow up to \$4,000 additionally under the unsubsidized loan program. Third and fourth year students may borrow up to \$5,000 additionally under the unsubsidized loan program.

### *Federal Direct Parent Loan for Undergraduate Students (PLUS)*

Parents of dependent undergraduate students may borrow up to the cost of attendance minus any other financial aid resources under the PLUS Program. The interest rate for the PLUS loan is adjusted annually with a cap of nine percent. To apply go to <https://studentloans.gov/> for application and Master Promissory Note.

### *Other Financial Assistance*

#### *State Scholarships*

Many states have established scholarship and grant programs to assist residents of their state. In Massachusetts, for example, students judged to be eligible can receive a \$1,700 award while attending a private institution within the Commonwealth. Other areas, such as Pennsylvania and Vermont have similar programs. Application can be made by completing the Free Application for Federal Student Aid or by writing to your state Board of Higher Education. This program is available to full-time undergraduate students.

#### *Outside Assistance*

Many scholarship and financial assistance programs are available to deserving students through local and state civic groups, clubs, and organizations. Students are urged to seek out such programs in their local areas. Enrollment Services also has several external scholarship publications for students to utilize. One may reference on the Internet ([www.finaid.org](http://www.finaid.org) or [www.fastweb.com](http://www.fastweb.com)) for links to other sources.

#### *Alternative Financing*

Several banks offer loans to students and parents to help pay for college. Loans can range from \$2,000 to cost of attendance. The interest rates are variable. No collateral is required, and borrowers must have a good credit rating and the ability to repay. Enrollment Services has additional information at <http://www1.wne.edu/student-administrative-services/financial-aid/alternative-financing.cfm>. These programs are available to full-time and part-time students.

### *Joan B. Mulcahy Student Loan Fund*

In 1971 an emergency student loan fund was established through the generosity of faculty, staff, students, and friends of the University in memory of Joan B. Mulcahy. This fund is used to assist students in need of lesser loans for relatively short periods of time and for help as emergencies develop. The fund is self-supporting through repayments, and loans are granted on an interest-free basis. The fund is administered by the dean of students. This program is available to full-time and part-time undergraduate students.

## LEGAL MATTERS

Western New England University is required by various state and federal statutes to publish information about certain legislation that may affect some or all of our students. That information is presented below.

### Student Absence Due to Religious Beliefs

The General Laws of Massachusetts, Chapter 151C, Section 213 states the following: "Any student in an educational or vocational training institution, other than a religious or denominational educational or vocational training institution, who is unable, because of his religious beliefs, to attend classes or to participate in any examination, study, or work requirement on a particular day shall be excused from any such examination or study or work requirement, and shall be provided with an opportunity to make up such examination, study, or work requirement which he may have missed because of such absence on any particular day; provided, however, that such makeup examination or work shall not create an unreasonable burden upon such school. No fees of any kind shall be charged by the institution for making available to the said student such opportunity. No adverse or prejudicial effects shall result to any students who avail themselves of the provisions of the section."

### Controlled Substances Act

Part of the federal omnibus drug legislation is the "Drug-Free Workplace" Act of 1988. Under the provisions of this legislation federal grants or contracts must certify that they will provide drug-free work places; individuals receiving funding directly from the federal government will also have to certify that their conduct will be drug free. In the case of colleges and universities, the Department of Education has said individual Pell Grant recipients will have to certify that they are drug free to receive their student aid awards.

If colleges and universities do not promote drug-free work places, drug-free awareness programs, or establish procedures for reporting violations, they are subject to sanctions including suspension of payments, suspension or termination of grants, or debarment, thus ineligible to receive grants or awards from a federal agency during the term of debarment.

Students applying for financial aid involving federal funding must certify that they are drug free, and that they will remain drug free, in order to receive such federally funded student aid awards. Appropriate forms for such certification are available in Enrollment Services.

No fees of any kind shall be charged by the institution for making available to the said student such opportunity. No adverse or prejudicial effects shall result to any students who avail themselves of the provisions of this section.

### Confidentiality of Student Records

The Family Educational Rights and Privacy Act of 1974 (revised 1988, 1993) assures students the right to inspect and review all University records, files, and data directly related to them, with the exception of medical and psychiatric records, confidential recommendations submitted before January 1, 1975, records to which a student has waived the right of access, and financial records of the student's parents. The Privacy Act also prohibits the distribution of grades to parents or guardians without the prior written consent of the student, or a statement of dependency from the parent when the student is a dependent under the criteria of the Internal Revenue Code.

The Privacy Act requires the University to respect the privacy of education records but provides the right to make public at its discretion, without prior authorization from the individual student, the following personally identifiable information: name of student; local and permanent addresses and telephone numbers (including cellular telephone numbers); email address; class year; school or division of enrollment, major field of study; enrollment status; date and place of birth; dates of attendance at Western New England University, nature and dates of degrees, honors and awards received; weight and height of student athletes; participation in officially recognized sports and activities; and high school and any institution of higher learning previously attended.

A student may limit the release of the above information by submitting a written request to Enrollment Services. However, drug and alcohol related incidents, which violate federal, state, or municipal laws, or any University policy related thereto, may be disclosed to parents under the following circumstances: (1) the student is under the age of 21, and (2) the University determines that the student has committed a disciplinary violation with respect to the use or possession of alcohol or drugs. Further details on the issue of privacy are also available at Enrollment Services..

### Discrimination/Harassment/Sexual Misconduct/Title IX Policy

#### Introduction

Western New England University is committed to the principle of equal opportunity in education and employment. The University prohibits discrimination against any employee, applicant for employment, student or applicant for admission on the basis of any protected class. Protected classes include: age, color, creed, disability, ethnicity, gender identity, gender expression, genetics, national origin, pregnancy, race, religion, ancestry, sex, sexual orientation, genetics, active military or veteran status or any other protected category under applicable federal and state or local law.

The University provides equal access and participation in all University activities without regard to sex. Sexual misconduct including sexual harassment, sexual assault and sexual exploitation are forms of sex discrimination and prohibited under Title IX of the Higher Education Amendments of 1972, Title VII of the Civil Rights Act of 1964, and Chapters 151B and 151C of the Massachusetts General Laws. If this conduct occurs off campus, it may fall under the purview of Title IX and Title VII and the University reserves the right to act on incidents occurring off campus.

In addition to the above mentioned regulations, the University also complies with the Violence Against Women Reauthorization Act of 2013 (VAWA)<sup>1</sup>, The Clery Act<sup>2</sup> and The Campus SaVE Act<sup>3</sup>.

Because the University takes allegations of discrimination/harassment seriously, the University will respond promptly to complaints of discrimination/harassment and will take appropriate action where it is determined that such inappropriate conduct has occurred. Furthermore, the University will act promptly to eliminate the conduct and impose such corrective action and sanctions as necessary.

This policy applies to any individual of either sex who participates in the University community as a student, faculty, staff member, visitor or any other persons having dealings with the institution."

The Chief Human Resource Officer (CHRO) serves as the EEO Officer and ADA 504 Coordinator and oversees the University's compliance efforts with discrimination and equal opportunity.

The Title IX & Compliance Officer serves as the Title IX Coordinator.

Internal inquiries or reports about violations of this policy may be made to:

Title IX Coordinator  
Sarah C. Butterick  
Title IX & Compliance Officer  
Rivers Memorial, Room 109  
(413) 782-1216  
sarah.butterick@wne.edu

ADA/504 Coordinator, Equal Employment Opportunity Officer  
Monica Bradley  
Interim Chief Human Resource Officer (CHRO)  
Rivers Hall, Room 104  
(413) 782-1343

Deputy Title IX Officer

Lori Mayhew- Athletics  
Alumni Healthful Living Center, Room 105B  
Assistant Director of Athletics/Equipment Director/Softball Coach  
(413) 796-2227  
lori.mayhew@wne.edu

Inquiries may be made externally to Office for Civil Rights (OCR)

US Department of Education 400 Maryland Ave SW Washington,  
DC 20202-1100  
Customer Service Hotline # (800) 421-3481  
Facsimile (202) 453-6012  
TDD# (877) 521-2172  
Email: OCR@ed.gov  
Web: <http://www.ed.gov/ocr>

Office for Civil Rights,  
Boston Office  
U.S. Department of Education  
8th Floor  
5 Post Office Square  
Boston, MA 02109-3921  
Telephone: (617) 289-0111  
Facsimile: (617) 289-0150  
Email: OCR.Boston@ed.gov

Boston Office-EEOC  
John F. Kennedy Federal Building 475 Government Center  
Boston, MA 02203  
Phone: 1-800-669-4000  
Fax: 617-565-3196  
Complaints can be filed Monday through Friday, from 8:30am to 3:00 pm.

Massachusetts Commission Against Discrimination (MCAD)  
436 Dwight Street, Room 222  
Springfield, MA 01103

## Accommodation of Disabilities

The University is committed to full compliance with the American with Disabilities Act of 1990 (ADA) and Section 504 of the Rehabilitation Act of 1973, which prohibits discrimination against qualified persons with disabilities.

The Assistant Vice President of Human Resources has been designated as the ADA/504 Coordinator for the University, responsible for coordinating efforts to comply with all disability laws. Employees requesting reasonable accommodation should complete the ADA Accommodation Request Form found on the Human Resources web page.

Students requesting accommodation should contact the Office of Student Disability Services located in Herman Hall, Room 105.

## Firearms Possession

The General Laws of the Commonwealth of Massachusetts "(MGLC. 269 Section 10 (j))" prohibit the unauthorized possession of any firearm on the campus of any college or university within the Commonwealth. Students should be aware that the Commonwealth of Massachusetts strictly enforces its firearm laws. In Massachusetts, conviction for the illegal possession of a firearm carries a mandatory one-year jail sentence.

## Hazing

Under Massachusetts General Laws, Chapter 269, Sections 17, 18, and 19, any form of "hazing" is considered to be a criminal offense punishable by a fine and/or imprisonment. Furthermore, persons who witness or have knowledge of hazing incidents and fail to report them are also subject to similar penalties.

Each Western New England University student organization and athletic team, at the beginning of the academic year, and every student, at the time of registration, is provided with a copy of the Massachusetts General Laws concerning hazing. The officers of student clubs and organizations are required to sign a formal statement acknowledging receipt of such regulations and verifying their adherence to refrain from any harassment or activities which may serve to cause embarrassment to prospective members, initiates, or pledges. Any student organization found to be involved in such hazing or harassment of members or prospective members will have its recognition immediately withdrawn and be required to disband. Individual organizers and participants in hazing will be subject to strong disciplinary action, including immediate dismissal from the University.

## Immunizations and Health Record Requirements

The laws of the Commonwealth of Massachusetts and Western New England University Health Services requires all full-time students to present evidence of immunization against measles, mumps, rubella, diphtheria, tetanus/pertussis, hepatitis B, varicella and meningitis. This requirement may be met by credible medical documentation or laboratory confirmation of immunity known as titers.

Immunizations may be received in Health Services and will be billed to your insurance.

Immunization history is included in the admission physical examination documentation and is to be submitted to Health Services by August 1. Student may not be allowed to move on campus, and or, begin classes without the required admission document and immunization record.



## Selective Service Registration

All male students who have not served either on active military duty or are not members of the Reserves and/or National Guard, or are not citizens of specific Federated States or Trust Territories, within 30 days of their 18th birthday must register with Selective Service. Furthermore, under Federal Regulations, Subpart C-Statement of Educational Purpose and Selective Service Registration Status, Sections 668.31, .32 and .33, appropriate registration with Selective Service is necessary before receiving any funds under Title IV, Higher Education Act Programs. The student can register for Selective Service during the FAFSA application process or by going online to [www.sss.gov](http://www.sss.gov). Until this has been done, he is ineligible to receive Title IV funding, including Perkins Loans, Ford Direct Loans, Supplemental Loans, Pell Grants, Work-Study, and similar federal monies.

## Smoke-Free Environment

In compliance with Massachusetts Smoke Free Work Place Law, M.G.L. Ch. 270 §22, the University is instituting a new smoking policy. This policy prohibits the use of any smoking paraphernalia, including electronic cigarettes and/or vapor smoking devices, within 25 feet of any University building, its entrance or windows.

Furthermore, no smoking is permitted within any University building, academic or residential.

The University anticipates the full cooperation of its students, faculty, staff, vendors, and visitors as to their compliance with this policy.

## Student Right-to-Know and Campus Security Act (Clery Act)

The University is in compliance with the federal Student Right-to-Know and Campus Security Act which requires colleges to disclose graduation rates for students and to make available certain statistics and campus security policies. According to the requirements, data in these areas were tabulated beginning July 1, 1991, and reported during the summer of 1992 and each summer thereafter. It is the University's policy to provide information concerning security services available on campus. The University also practices the policy of notifying the University community as soon as possible after the commission of any crime that might portend personal danger to either students or employees. Campus crime statistics are available from the University's Department of Public Safety. Also, Enrollment Services makes available data on graduation rates, athletic participation rates, and financial support.

Pursuant to the Campus Sex Crimes Prevention Act, any member of the Western New England University community may obtain information provided by the Commonwealth of Massachusetts as to any registered sex offender who may be enrolled or working at the University by contacting the Department of Public Safety.

## Universal Health Care

The Commonwealth of Massachusetts passed the Universal Health Care Act in 1988. Its provisions require that all full-time and three-quarter-time students be covered by health insurance that contains comprehensive, specified areas. Students must either enroll in the policy provided by the University or negotiate a hard waiver stipulating that the personal coverage already possessed contains all of the required coverage. No student can be admitted to class until one of the above options has been exercised.

## TRUSTEES

University Board of Trustees

# DIRECTORY

Directory

## TRAVEL DIRECTIONS

### From the East and West (Boston, Albany) via the Massachusetts Turnpike (I-90)

Leave the Mass. Pike at Exit 6. Turn left onto I-291. Take Exit 5 off I-291 (“Route 20-A West to East Springfield”). Bear right at the end of the exit ramp on Page Blvd. Take the left at the first light onto Roosevelt Ave. Take Roosevelt Ave. 2.5 miles to the intersection with Wilbraham Road (fifth traffic light). Turn left onto Wilbraham Road and follow it 1.5 miles through the second light. Turn right into the parking lot of the Kevin S. Delbridge Welcome Center. (Total 5.6 miles from Mass. Pike.)

### From the North via Interstate 91

Leave I-91 at Exit 8, (“Ludlow, Boston 1-291”). Travel to Exit 5B, (“East Springfield”). Turn right off of the ramp onto Page Blvd. At the first light, turn left onto Roosevelt Ave. Take Roosevelt Ave. 2.5 miles to the intersection with Wilbraham Road (fifth traffic light). Turn left onto Wilbraham Road and follow it 1.5 miles through the second light. Turn right into the parking lot of the Kevin S. Delbridge Welcome Center. (Total 8.6 miles from I-91.)

### From the South via Interstate 91

Leave I-91 at Exit 2 (“East Longmeadow”). Follow signs (“Route 83”) to the light at the intersection of Longhill and Sumner Ave. Turn right onto Sumner Ave. Travel straight on Sumner Ave. (which becomes Allen St.) to the light at the intersection of Allen St. and Bradley Road (3.2 miles). Turn left onto Bradley Road and travel 1.6 miles to Wilbraham Road and turn right. Travel 0.2 miles and turn right, into the parking lot of the Kevin S. Delbridge Welcome Center. (Total 5.7 miles from I-91.)



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