Accelerated Dual Degree BS in Chemistry/MSPS

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 Chemistry 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 one additional year of course study and a second year of thesis research beyond the normal 4-year bachelor's program.

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 chemistry major, whom are on track to complete the bulk of the required courses (not electives) 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, meet with the program coordinator for admission consideration into the MSPS program.

After successfully completing the fourth year of undergraduate coursework students will be awarded a Bachelor of Science degree in Chemistry, 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 successfully completing all course work and the thesis research requirements of the MSPS program, assuming all the degree requirements have been met (38 credits), students will be awarded the Master of Science in Pharmaceutical Sciences.

There will be cross-credits between the two programs, i.e., courses for which credit will apply to the completion of both degrees. In the fourth year of undergraduate coursework, students admitted to the MSPS program will take up to four 2-3 credit MSPS courses (one or two in the fall and one or two in the spring), which can potentially fulfill CHEM or GEN elective requirements. Up to 12 credits of MSPS courses (with some exceptions) will fulfill course requirements in the BS degree.

For the BS in Chemistry, the courses PHAR 512 (Immunology), PHAR 514 (Pharmaceutics I), PHAR 524 (Pharmaceutics II), PHAR 522 (Pathophysiology), PHAR 523 (Medical Genetics & Pharmacogenomics), PHAR 525 (Pharmaceutics I lab), PHAR 612 (Principles of Medicinal Chemistry), PHRSC 515 (Principles of Pharmacology), PHRSC 556 (Pharmacokinetic Sciences), and PHRSC 557 (Mechanisms of Drug Action) and all PHAR XXX (Pharmacy Elective) first year MSPS courses can fulfill 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. PHAR 513 (Biochemistry) cannot count towards the undergraduate degree. The COPHS will accept CHEM 314 in lieu of PHAR 513 to fill the biochemistry requirement of the MS in Pharmaceutical Sciences for students enrolled in this dual degree program, if a student earns at least a B- in the course.

The MSPS program offers focus areas in Pharmacology; Medicinal Chemistry and Drug Development; Pharmaceutics and Drug Delivery; Pharmacogenomics; Biomedical Sciences; Pharmacoeconomics and Healthcare Data Analytics; and Biopharmaceutical Sciences and Technology. Students, in consultation with their faculty advisors, will select the MSPS electives.

Students in the 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

BS-Chemistry 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 some of the below listed MSPS courses in the 4th year. Students will meet with the MSPS Program Coordinator to decide which of the below courses they will take as a 4th year undergraduate.

Fall – PHRSC 527	Data Analysis and Biostatistics	3 cr.
Fall – PHRSC 529	Responsible Conduct of Research	3 cr.
Fall – PHRSC 582	cGXP and Regulatory Affairs	3 cr.
Fall – PHRSC/PHAR XXX	Elective	2-4 cr.
Spring – PHRSC 557	Mechanisms of Drug Action	3 cr.
Spring – PHRSC 572	Advanced Therapeutic Medicinal Products	3 cr.
Spring – PHRSC/PHAR XXX	Elective	2-4 cr.

Suggested Course Sequence

Freshman Year BS Chemistry - Fall Semester

CHEM 105	General Chemistry I	4 cr.
ENGL 132	English Composition I	3 cr.
BLUE 101	BLUE Course	1 cr.
MATH 133	Calculus I	4 cr.
-	or	-
MATH 127	Calculus I with Precalculus Review	5 cr.
GBD XXX	Golden Bear Discovery/GOLD	3 cr.

Subtotal: 15-16 cr.

Freshman Year BS Chemistry - 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.

Subtotal: 17 cr.

Sophomore Year BS Chemistry - 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.

Subtotal: 14 cr.

Sophomore Year BS Chemistry - 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.
CHEM 211	Analytical Methods	3 cr.
CHEM 221	Analytical Methods Laboratory	1 cr.
GEN XXX	General Elective	3 cr.

Subtotal: 15 cr.

Junior Year BS Chemistry - Fall Semester

CHEM 317	Physical Chemistry I	3 cr.
CHEM 327	Physical Chemistry Laboratory I	1 cr.
GBD XXX	Golden Bear Discovery	3 cr.
GBD XXX	Golden Bear Discovery	3 cr.
WIC 2XX	Writing Intensive Course	3 cr.
GEN XXX	General Elective	3 cr.

Subtotal: 16 cr.

Junior Year BS Chemistry - 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.
GBD XXX	Golden Bear Discovery	3 cr.
GEN 3XX	General Elective	3 cr.

Subtotal: 14 cr.

Senior Year BS Chemistry - Fall Semester

CHEM 312	Instrumental Analysis	3 cr.
CHEM 322	Instrumental Analysis Laboratory	1 cr.
GBD XXX	Golden Bear Discovery	3 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN 3XX	General Elective	3 cr.

Subtotal: 16 cr.

Recommended MSPS Electives (two of the courses listed below):

PHRSC 527	*Data Analysis and Biostatistics*	*3 cr.*
PHRSC 529	*Responsible Conduct of Research*	*3 cr.*
PHRSC 582	*cGXP and Regulatory Affairs*	*3 cr.*
PHRSC/PHAR XXX	*Elective*	*2-4 cr.*

Senior Year BS Chemistry - Spring Semester

CHEM 421	Inorganic Chemistry	3 cr.
CHEM 431	Inorganic Chemistry Laboratory	1 cr.
CHEM 470	Seminar in Chemistry	1 cr.
GEN XXX	General Elective	3 cr.
GEN XXX	General Elective	3 cr.
GEN 3XX	General Elective	3 cr.

Subtotal: 14 cr.

Recommended MSPS Electives (two of the courses listed below):

PHRSC 557	*Mechanisms of Drug Action*	*3 cr.*
PHRSC 572	*Advanced Therapeutic Medicinal Products*	*3 cr.*
PHRSC/PHAR xxx	*Elective*	*2-4 cr.*

MSPS Curriculum Years – 24-28 Total Credit Hours over the Last 2 Years

MSPS – First Year Fall Semester

PHRSC 510	Seminar & Journal Club 1	1 cr.
PHRSC 525	Analytical techniques Lab	1 cr.
PHRSC 527	*Data Analysis & Biostatistics*	*3 cr.*
PHRSC 529	*Responsible Conduct of Research*	*3 cr.*
PHRSC 582	*cGXP and Regulatory Affairs*	*3 cr.*
PHRSC 630	Scientific Communications	3 cr.
PHAR-PHRSC xxx	*MSPS Elective(s)*	*2-4 cr.*

MSPS Subtotal: 10-12
Subtotal including senior year MSPS Courses: 16-18

Italicized courses are those that may have been taken as a 4th year undergraduate.

MSPS – First Year Spring Semester

PHRSC 520	Seminar & Journal Club 2	1 cr.
PHRSC 557	*Mechanisms of Drug Action*	*3 cr.*
PHRSC 572	*Advanced Therapeutic Medicinal Products*	*3 cr.*
PHAR-PHRSC xxx	*MSPS Elective(s)*	*5-8 cr.*

MSPS Subtotal: 6-8
Subtotal including senior year MSPS courses: 12-14

Italicized courses are those that may have been taken as a 4th year undergraduate.

MSPS – First Year Summer

PHRSC 528	Thesis Research 1	2 cr.

MSPS Subtotal: 2

Second Year MSPS - Fall Semester

PHRSC 618	Thesis Research 2	3 cr.

MSPS Subtotal: 3

Second Year MSPS - Spring Semester

PHRSC 628	Thesis Research 3	3 cr.

MSPS Subtotal: 3

MSPS Subtotal: 38

Total MSPS Credit Hours: 38

MSPS 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.