

CHEMISTRY, BACHELOR OF SCIENCE WITH A CONCENTRATION IN MEDICINAL CHEMISTRY

To obtain a B.S. with a major in Chemistry and a concentration in Medicinal Chemistry, a student must fulfill university, college, and departmental requirements. Minimum hour requirements follow:

- 46 hours of University General Education courses (*Testing out of academic skills requirements and enrolling in General Education courses that meet both distribution and diversity requirements are likely to reduce the total number of General Education hours to 34 or fewer.*)
- 12 hours college breadth requirement
- 51 hours of major courses (including the optional concentration)
- 19 hours of cognate courses
- Elective hours as required to total 120 hours

TOTAL HOURS: 120

Requirements

A Bachelor of Science degree in chemistry with a concentration in medicinal chemistry requires a minimum of 51 credit hours of coursework in both chemistry and biology.

Code	Title	Credits
Required Chemistry Courses		
CHEM 1180 & CHEM 1184	GENERAL CHEMISTRY I and GENERAL CHEMISTRY I LABORATORY	4
CHEM 1190 & CHEM 1194	GENERAL CHEMISTRY II and GENERAL CHEMISTRY II LABORATORY	4
CHEM 2250	ORGANIC CHEMISTRY I	3
CHEM 2260 & CHEM 2274	ORGANIC CHEMISTRY II and ORGANIC CHEMISTRY LABORATORY	5
CHEM 2400 & CHEM 2404	QUANTITATIVE ANALYSIS and QUANTITATIVE ANALYSIS LAB	4
CHEM 2500	INTRODUCTION TO INORGANIC CHEMISTRY	3
CHEM 3350 & CHEM 3354	PHYSICAL CHEMISTRY I and PHYSICAL CHEMISTRY I LABORATORY	4
CHEM 3710	ESSENTIALS OF MEDICINAL CHEMISTRY	3
CHEM/BIOLOG 4650	BIOCHEMISTRY I (with the following lab)	3
CHEM/BIOLOG 4654	BIOCHEMISTRY I LABORATORY	1
Additional Lecture		
Select one of the following:		3-4
CHEM 3210	INTRODUCTION TO MOLECULAR MODELING (3 cr)	
CHEM 4230	ADVANCED ORGANIC CHEMISTRY - SYNTHESIS (3 cr)	
CHEM 4240	ADVANCED ORGANIC CHEMISTRY - MECHANISM (3 cr)	
CHEM 4250	ADVANCED ORGANIC CHEMISTRY: MECHANISMS AND MODELING (4 cr) (additional lab not required if 4250 is taken)	

CHEM/BIOLOG 4660	BIOCHEMISTRY II (3 cr plus Biochemistry II Lab)	
Additional Lab		
Select one of the following:		1
CHEM 3424	SPECTROMETRIC CHARACTERIZATIONS (1 cr)	
CHEM/BIOLOG 4664	BIOCHEMISTRY II LABORATORY (1 cr)	
CHEM 4950	CHEMISTRY PROJECTS (1 cr)	
Biology Requirements		
BIOL 1450	BIOLOGY I	5
BIOL 2140	GENETICS	4
Advanced Courses		
Select 4 credit hours from advanced courses (listed below)		4
Total Credits		51-52

Advanced Courses

Code	Title	Credits
Analytical		
CHEM 3030	ENVIRONMENTAL CHEMISTRY	3
CHEM 3424	SPECTROMETRIC CHARACTERIZATIONS	1
CHEM 4400	INSTRUMENTAL ANALYSIS	3
CHEM 4404	INSTRUMENTAL ANALYSIS LABORATORY	1
Biochemistry		
CHEM/BIOLOG 4660	BIOCHEMISTRY II	3
CHEM/BIOLOG 4664	BIOCHEMISTRY II LABORATORY	1
CHEM 4670	PROTEIN PURIFICATION AND CHARACTERIZATION	2
Inorganic		
CHEM 3514	INORGANIC PREPARATIONS	1
CHEM 4500	ADVANCED INORGANIC CHEMISTRY	3
CHEM 4510	SOLID STATE INORGANIC CHEMISTRY	3
CHEM 4540	GEOCHEMISTRY	3
Nuclear		
CHEM 4320	NUCLEAR CHEMISTRY	3
Organic		
CHEM 3210	INTRODUCTION TO MOLECULAR MODELING	3
CHEM 4230	ADVANCED ORGANIC CHEMISTRY - SYNTHESIS	3
CHEM 4240	ADVANCED ORGANIC CHEMISTRY - MECHANISM	3
CHEM 4250	ADVANCED ORGANIC CHEMISTRY: MECHANISMS AND MODELING	4
Physical Chemistry		
CHEM 3360	PHYSICAL CHEMISTRY II	3
CHEM 3364	PHYSICAL CHEMISTRY II LABORATORY	1
Polymer		
CHEM 4310	POLYMER CHEMISTRY	3
Research		
CHEM 4950	CHEMISTRY PROJECTS	1
CHEM 4960	CHEMISTRY PROBLEMS	1-3
Internship		
CHEM 4810	CHEMISTRY INTERNSHIP	1-6
Special Topics		
CHEM 4930	SPECIAL TOPICS IN CHEMISTRY	1-3
Biology		
BIOL 3020	MOLECULAR BIOLOGY OF THE CELL	3
BIOL 3240	INTRODUCTION TO IMMUNOLOGY	3

BIOL 3830	BIOLOGY OF PATHOGENIC MICROORGANISMS	3
BIOL 4130	MOLECULAR GENETICS	4
BIOL 4140	CELLULAR BIOLOGY	4
BIOL 4450	VIROLOGY	3
BIOL 4640	MOLECULAR MICROBIOLOGY	3
BIOL 4730	VERTEBRATE ENDOCRINOLOGY	4
BIOL 4850	DEVELOPMENTAL BIOLOGY	3
BIOL 4860	COMPARATIVE GENOMICS	3

Required Cognate Courses

Code	Title	Credits
MATH 1950	CALCULUS I	5
MATH 1960	CALCULUS II	4

Select one of the following sequences: **10**

Sequence I

PHYS 1110 & PHYS 1154	GENERAL PHYSICS I and GENERAL PHYSICS LABORATORY I	
PHYS 1120 & PHYS 1164	GENERAL PHYSICS II and GENERAL PHYSICS LABORATORY II	

Sequence II

PHYS 2110 & PHYS 1154	GENERAL PHYSICS I - CALCULUS LEVEL and GENERAL PHYSICS LABORATORY I	
PHYS 2120 & PHYS 1164	GENERAL PHYSICS-CALCULUS LEVEL and GENERAL PHYSICS LABORATORY II	

Total Credits **19**

Code	Title	Credits
Recommended but not required		
MATH 1970	CALCULUS III	4

These courses can be applied to pre-professional curricula. For example, with proper selection of electives and sequencing of requirements, pre-pharmacy students may meet UNMC College of Pharmacy entrance requirements in three years and still be able to complete a B.S. in chemistry with a concentration in medicinal chemistry in four years.

To graduate with an ACS certified degree, see your chemistry advisor for proper course selection.

Freshman

Code	Title	Credits
Fall		
CHEM 1180 & CHEM 1184	GENERAL CHEMISTRY I and GENERAL CHEMISTRY I LABORATORY (*)	4
CMST 1110 or CMST 2120	PUBLIC SPEAKING FUNDS or ARGUMENTATION AND DEBATE	3
ENGL 1150	ENGLISH COMPOSITION I (**)	3
MATH 1950	CALCULUS I (***)	5

*CHEM 1180: See catalog for most up-to-date prerequisites. Must take CHEM 1184 concurrently.

**ENGL 1150: Requires appropriate placement.

***MATH 1950: Requires appropriate Math placement. MATH 1950 is part of the BS Cognate.

Credits **15**

Spring

CHEM 1190 & CHEM 1194	GENERAL CHEMISTRY II and GENERAL CHEMISTRY II LABORATORY (*)	4
ENGL 1160	ENGLISH COMPOSITION II (**)	3
MATH 1960	CALCULUS II (***)	4

Humanities and Fine Arts / Global Diversity Course **3**

*CHEM 1190: See catalog for most up-to-date prerequisites. Must take CHEM 1194 concurrently.

**ENGL 1160: Requires ENGL 1150 or placement.

***MATH 1960 requires MATH 1950. MATH 1960 is part of the BS Cognate.

Credits **14**

Sophomore**Fall**

CHEM 2250	ORGANIC CHEMISTRY I (*)	3
CHEM 2400 & CHEM 2404	QUANTITATIVE ANALYSIS and QUANTITATIVE ANALYSIS LAB (**)	4
HIST 1000	WORLD HISTORY TO 1500 (or Minor/2nd Major course***)	3

Social Science **3**

Humanities and Fine Arts **3**

*CHEM 2250: See catalog for most up-to-date prerequisites.

**CHEM 2400: See catalog for most up-to-date prerequisites. Must take CHEM 2404 concurrently.

***CAS Requirement

Credits **16**

Spring

CHEM 2260 & CHEM 2274	ORGANIC CHEMISTRY II and ORGANIC CHEMISTRY LABORATORY (*)	5
CHEM 2500	INTRODUCTION TO INORGANIC CHEMISTRY (**)	3
HIST 1010	WORLD HISTORY SINCE 1500 (or Minor/2nd Major Course***)	3
PHYS 1110 or PHYS 2110	GENERAL PHYSICS I (^) or GENERAL PHYSICS I - CALCULUS LEVEL	4
PHYS 1154	GENERAL PHYSICS LABORATORY I	1

*CHEM 2260: Requires CHEM 2250 with grade of C- or better. Must take CHEM 2274 concurrently.

**CHEM 2500: See catalog for most up-to-date prerequisites.

***CAS Requirement

^PHYS 1110: MATH 1220/1300 or higher with minimum grade of C-; or proficiency via approved scores from ACT, SAT, AP, or a placement exam. PHYS 2110 Requires MATH 1950 with C- min. PHYS 1110/2110+1154 are part of the BS Cognate.

Credits **16**

Junior**Fall**

CHEM 4650 & CHEM 4654	BIOCHEMISTRY I and BIOCHEMISTRY I LABORATORY (*)	4
PHYS 1120 or PHYS 2120	GENERAL PHYSICS II (**) or GENERAL PHYSICS-CALCULUS LEVEL	4
PHYS 1164	GENERAL PHYSICS LABORATORY II	1
Humanities and Fine Arts***		3
Social Science / US Diversity		3

*CHEM 4650: See catalog for the most up-to-date prerequisites. CHEM 4654 must be taken concurrently.

**PHYS 1120: Requires PHYS 1110 with min grade of C-. PHYS 2120 requires PHYS 2110 and MATH 1960. PHYS 1120/2120 & 1164 are part of the BS Cognate.

***Humanities/Fine Arts course must come from 2nd discipline.

Credits		15
Spring		
BIOL 1450	BIOLOGY I	5
CHEM 3710	ESSENTIALS OF MEDICINAL CHEMISTRY (*)	3
NSCI 3940	WRITING IN CHEMISTRY (**)	2
Additional Chemistry Lecture***		3-4
Additional Chemistry Lab***		1
*CHEM 3710: Requires ENGL 1160 and CHEM 2260+2274.		
**NSCI 3940: Requires ENGL 1160, and CHEM 2400 or 2500.		
***Must take one additional lecture and additional lab related to Organic Chemistry or CHEM 4660+4664 or CHEM 4250. See UNO catalog for options.		

the program. In order to graduate on-time (four years for an undergraduate degree), you need to take 30 hours each year.

Placement Exams: For Math, English, Foreign Language, a placement exam may be required. More information on these exams can be found at <https://www.unomaha.edu/enrollment-management/testing-center/placement-exams/information.php>

**Transfer credit or placement exam scores may change suggested plan of study

GPA Requirements: 2.0

Credits		14-15
Senior		
Fall		
BIOL 2140	GENETICS (*)	4
CHEM 3350 & CHEM 3354	PHYSICAL CHEMISTRY I and PHYSICAL CHEMISTRY I LABORATORY (**)	4
Social Science***		3
Additional Humanities and Fine Arts or Minor/2nd Major Course^		3
*BIOL 2140: Requires BIOL 1450, 1750, and CHEM 1180. BIOL 1750 is waived for Chemistry majors.		
**CHEM 3350: Requires CHEM 2260+2274, 2400+2404, PHYS 2120 or 1120, and MATH 1960.		
***Social Science course must be in a 2nd discipline.		
^CAS Requirement: Humanities/Fine Arts Course must be in a 3rd discipline.		

Credits		14
Spring		
Advanced Chemistry Elective*		4
Additional Social Science or Minor/2nd Major Course**		3
Elective or Minor/2nd Major Course***		3
Elective or Minor/2nd Major Course***		3
Elective Course***		3
*Must take 4 credit hours of Advanced Chemistry Electives. See Catalog for options.		
**CAS Requirement: Social Science Course must be in a 3rd discipline.		
***Students need a minimum of 120 credits to graduate. Electives, minors, or a 2nd major may be used to reach this minimum.		

Credits		16
Total Credits		120-121

This roadmap is a suggested plan of study and does not replace meeting with an advisor. Please note that students may need to adjust the actual sequence of courses based on course availability. Please consult an advisor in your major program for further guidance.

This plan is not a contract and curriculum is subject to change

Additional Information About this Plan:

University Degree Requirements: The minimum number of hours for a UNO undergraduate degree is 120 credit hours. Please review the requirements for your specific program to determine all requirements for