

BS in Chemistry

Degree Program Description

Chemistry is the study of matter and substances in order to understand, explain and predict how substances change. The BS degree is designed for those students who desire a more focused education in Chemistry and related Sciences than that provided by the BA degree, which is more general. There are three degree tracks for those who are pursuing a BS. The American Chemical Society certification track is recommended for BS students who desire professional employment as chemists or who plan to pursue graduate education in chemistry. A medicinal chemistry track is available to BS students who plan careers in the health professions or in pharmaceutical, clinical or medicinal chemistry. The third BS track, leading to simultaneous completion of a BS in Chemistry and a BSEd in Secondary Education with Emphasis in Chemistry, is appropriate for those students who wish to teach chemistry in secondary schools. Most chemistry majors continue their education in the best graduate schools or professional schools in the country. Many of our graduates are now physicians or have teaching and research careers at universities and colleges. Other graduates are managers in industry and specialists in their fields.

Major Program Requirements

Department Level Requirements (<https://catalog.missouri.edu/collegeofartsandscience/chemistry/chemistry-major-requirements/>) must be completed in addition to University (<https://catalog.missouri.edu/academicdegreerequirements/universityrequirements/>), general education (<https://catalog.missouri.edu/academicdegreerequirements/generaleducationrequirements/>), and College of Arts and Science (<https://catalog.missouri.edu/collegeofartsandscience/#undergraduatetext>) requirements. Students must also meet the following major program requirements. All major requirements in the College of Arts and Science must be completed with grades of C- or higher unless otherwise indicated.

Students should consult with a chemistry advisor to schedule science and mathematics requirements in the appropriate order. Note that for a number of chemistry courses there is a prerequisite of a grade of C or better in a previous course. Please see the Associate Chair for Undergraduate Studies for assignment of an advisor.

Note that students pursuing a BS degree with a major in Chemistry may opt to satisfy the foreign language requirement through alternative course work consisting of no fewer than 12 credits numbered 2000 or above.

Major Core Requirements

CHEM 1400 & CHEM 1401	College Chemistry I and College Chemistry I Laboratory	4
CHEM 1410 & CHEM 1411	College Chemistry II and College Chemistry II Laboratory	4
CHEM 2100	Organic Chemistry I	3
CHEM 2110	Organic Chemistry II	3
CHEM 2130	Organic Laboratory I	2
CHEM 2140	Organic Laboratory II	2
CHEM 2400	Fundamentals of Inorganic Chemistry with Lab	3
CHEM 3200	Quantitative Methods of Analysis with Lab	4

CHEM 3700W	Undergraduate Seminar in Chemistry - Writing Intensive	3
MATH 1500	Analytic Geometry and Calculus I	5
MATH 1700	Calculus II	5
Total Credits		38

Chemistry Major with BS Degree American Chemical Society Certification Track

CHEM 4310	Physical Chemistry I	3
CHEM 4330	Physical Chemistry II	3
CHEM 4340	Physical Chemistry Laboratory	3
CHEM 3700W	Undergraduate Seminar in Chemistry - Writing Intensive	3
CHEM 4200	Instrumental Methods of Analysis with Lab	3
CHEM 4400	Inorganic Chemistry	3
CHEM 4950 or CHEM 4990H	Senior Research Senior Honors Research I	3
BIOCHM 4270	Biochemistry	3
PHYSICS 2750	University Physics I	5
PHYSICS 2760	University Physics II	5
MATH 2300	Calculus III	3
Total Credits		37

Medicinal Chemistry Track

CHEM 4310	Physical Chemistry I	3
CHEM 3700W	Undergraduate Seminar in Chemistry - Writing Intensive	3
CHEM 4170	Medicinal Chemistry	3
CHEM 4600 or BIO_SC 4328	Introduction to Radiochemistry with Lab Introductory Radiation Biology	3
PHYSICS 1210 or PHYSICS 2750	College Physics I University Physics I	4
PHYSICS 1220 or PHYSICS 2760	College Physics II University Physics II	4
BIO_SC 1500	Introduction to Biological Systems with Laboratory	5
BIO_SC 2200	General Genetics	4
BIO_SC 2300	Introduction to Cell Biology	4
BIOCHM 4270	Biochemistry	3
BIOCHM 4272	Biochemistry	3
Total Credits		39

Dual Degree in Chemistry and Secondary Education

CHEM 4800	Chemistry Teaching Practicum	3
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Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

Sample Eight-Semester Program - Bachelor of Science with a Major in Chemistry (ACS Certification Track)

First Year			
Fall	CR	Spring	CR
CHEM 1400 & CHEM 1401		4 CHEM 1410 & CHEM 1411	4
MATH 1500 (Math and Quantitative Reasoning)*		5 MATH 1700	5
ENGLSH 1000*		3 PHYSCS 2750 (Biological or Physical Science Lab)	5
Missouri State Law Requirement: Social Science from Arts & Science		3	
		15	14
Second Year			
Fall	CR	Spring	CR
CHEM 2100		3 CHEM 2110	3
MATH 2300		3 CHEM 2130	2
PHYSCS 2760		5 Behavioral Science; First Writing Intensive	3
Humanities		3 Humanities	3
Second major, minor, certificate, or elective		3 Second major, minor, certificate, or elective	3
		17	14
Third Year			
Fall	CR	Spring	CR
CHEM 2400		3 CHEM 2140	2
CHEM 3200		4 CHEM 3700W	3
CHEM 4310		3 CHEM 4330	3
Second Language or Alternative		4 Second Language or Alternative	4
		Second major, minor, certificate, or elective	3
		14	15
Fourth Year			
Fall	CR	Spring	CR
CHEM 4200		3 CHEM 4400	3
BIOCHM 4270		3 CHEM 4340	3
Second Language or Alternative		4 CHEM 4950 or 4990H	3
Social Science; 2000+ Level		3 Humanities	3
Second major, minor, certificate, or elective		3 Second major, minor, certificate, or elective	3
		16	15

Total Credits: 120

* Courses satisfy certain University general education requirements.

Sample Eight-Semester Program - Bachelor of Science with a Major in Chemistry (Medicinal Chemistry Track)

Check the Undergraduate Catalog for Prerequisites.

First Year			
Fall	CR	Spring	CR
CHEM 1400 & CHEM 1401		4 CHEM 1410 & CHEM 1411	4
MATH 1500 (Math and Quantitative Reasoning)*		5 MATH 1700	5
English 1000		3 Missouri State Law Requirement; Social Science from Arts & Science	3
Behavioral Science		3 Humanities; First Writing Intensive	3
		15	15
Second Year			
Fall	CR	Spring	CR
CHEM 2100		3 CHEM 2110	3
BIO_SC 1500 (Biological or Physical Science Lab)		5 CHEM 2130	2
PHYSCS 1210		4 BIO_SC 2200	4
Behavioral Science; Arts & Science Diversity Requirement		3 PHYSCS 1220	4
		Second major, minor, certificate, or elective	3
		15	16
Third Year			
Fall	CR	Spring	CR
CHEM 2400		3 CHEM 2140	2
CHEM 3200		4 CHEM 3700W	3
BIO_SC 2300		4 BIOCHM 4270	3
Second Language or Alternative		4 Second Language or Alternative	4
		Second major, minor, certificate, or elective	3
		15	15
Fourth Year			
Fall	CR	Spring	CR
CHEM 4310		3 CHEM 4170	3
BIOCHM 4272		3 Chemistry Elective (e.g. CHEM 4600)	3
Second Language or Alternative		4 Humanities 2000+	3
Humanities		3 Second major, minor, certificate, or elective	4
Second major, minor, certificate, or elective		3	
		16	13

Total Credits: 120

* Courses satisfy certain University general education requirements.