

CHEMISTRY, BS

Degree: Bachelor of Science (BS)

Major: Chemistry

Program Overview

The BS program in chemistry is designed for students who seek professional careers in the chemical sciences and is certified by the American Chemical Society. The BS curriculum provides a rigorous background in chemistry, yet offers considerable flexibility in the senior year in the choice of electives, allowing BS majors to pursue areas of chemistry of particular interest to them in greater depth. At least three units of research (CHEM 397 / CHEM 398) are required, and up to nine units of research may be credited toward the degree.

Undergraduate Policies

For undergraduate policies and procedures, please review the Office of Undergraduate Studies section of the General Bulletin.

Accelerated Master's Programs

Undergraduate students may participate in accelerated programs toward graduate or professional degrees. For more information and details of the policies and procedures related to accelerated studies, please visit the Office of Undergraduate Studies section of the General Bulletin.

Program Requirements

Students seeking to complete this major and degree program must meet the general requirements for bachelor's degrees and the general requirements of the College of Arts and Sciences. Students completing this program as a secondary major while completing another undergraduate degree program do not need to satisfy the latter set of requirements.

Required Chemistry Courses

Code	Title	Hours
Required Courses		
CHEM 105	Principles of Chemistry I	3
CHEM 113	Principles of Chemistry Laboratory	2
CHEM 106	Principles of Chemistry II	3
CHEM 304	Quantitative Analysis Laboratory	2
CHEM 310	Foundations of Analytical Chemistry	3
CHEM 323	Organic Chemistry I	3
CHEM 311	Inorganic Chemistry I	3
CHEM 322	Laboratory Methods in Organic Chemistry	3
CHEM 324	Organic Chemistry II	3
CHEM 331	Laboratory Methods in Inorganic Chemistry	3
CHEM 335	Physical Chemistry I	3
CHEM 332	Laboratory Methods in Physical Chemistry	3
CHEM 336	Physical Chemistry II	3
Research Requirement		
CHEM 397	Undergraduate Research	3 - 6
or CHEM 398	Undergraduate Research/Senior Capstone Project	

Biochemistry Requirement

Choose one of the following:		3-4
CHEM 328	Introductory Biochemistry I	
CHEM 329	Biochemistry II: Living Systems	
BIOC 307	Introduction to Biochemistry: From Molecules To Medical Science	

Elective Courses

Chemistry Elective (two 300-level courses) *	6-8
Technical Electives **	6-8

Total Hours **55**

* The chemistry elective may be any chemistry department course at the 300 level or above which is not part of the "core set," or selected courses with a strong chemistry content at the 300 level or above from other science departments. Only three units of CHEM 397 may be applied to a chemistry elective.

** The technical electives may be chosen more widely from any of the physical sciences, math, or engineering courses. An additional six units of CHEM 397 may be taken as technical electives. Further additional units of CHEM 397 may be taken as free electives. Students may wish to group their electives into "tracks" of specialization in order to tailor their degree to a particular area of chemistry.

Additional Required Courses

Code	Title	Hours
MATH 121	Calculus for Science and Engineering I	4
MATH 122	Calculus for Science and Engineering II	4
or MATH 124	Calculus II	
MATH 223	Calculus for Science and Engineering III	3
or MATH 227	Calculus III	
Select one of the following:		3
MATH 224	Elementary Differential Equations	
MATH 228	Differential Equations	
STAT 312	Basic Statistics for Engineering and Science	
PHYS 121	General Physics I - Mechanics	4
or PHYS 123	Physics and Frontiers I - Mechanics	
PHYS 122	General Physics II - Electricity and Magnetism	4
or PHYS 124	Physics and Frontiers II - Electricity and Magnetism	
PHYS 221	Introduction to Modern Physics	3
Total Hours		25

The chemistry elective may be any chemistry department course at the 300 level or above which is not part of the "core set," or selected courses with a strong chemistry content at the 300 level or above from other science departments. Only three units of CHEM 397 may be applied to a chemistry elective.

The technical electives may be chosen more widely from any of the physical sciences, math, or engineering courses. An additional six units of CHEM 397 may be taken as technical electives. Further additional units of CHEM 397 may be taken as free electives. Students may wish to group their electives into "tracks" of specialization in order to tailor their degree to a particular area of chemistry.

Advanced Coursework

BS majors who plan to go on to graduate study may elect to take advanced courses in:

Code	Title	Hours
Inorganic Chemistry		
CHEM 412	Advanced Inorganic Chemistry I	3
Organic Chemistry		
CHEM 421	Advanced Organic Chemistry I	3
CHEM 435	Synthetic Methods in Organic Chemistry	3
Physical Chemistry		
CHEM 406	Chemical Kinetics	3
CHEM 446	Quantum Mechanics I	3

Students can also elect to take other graduate offerings. Interdisciplinary strengths can be achieved by selecting technical electives in biochemistry, biomedical engineering, chemical engineering, macromolecular science, and materials science as well as in biology; earth, environmental, and planetary sciences; mathematics, applied mathematics, and statistics; and physics.

Total Units Required for Graduation: 120

Sample Plan of Study

Required Chemistry Courses and Sequencing

First Year

Fall		Hours
CHEM 105	Principles of Chemistry I	3
CHEM 113	Principles of Chemistry Laboratory	2
Hours		5

Spring

CHEM 106	Principles of Chemistry II	3
Hours		3

Second Year

Fall

CHEM 304	Quantitative Analysis Laboratory	2
CHEM 310	Foundations of Analytical Chemistry	3
CHEM 323	Organic Chemistry I	3
Hours		8

Spring

CHEM 311	Inorganic Chemistry I	3
CHEM 322	Laboratory Methods in Organic Chemistry	3
CHEM 324	Organic Chemistry II	3
Hours		9

Third Year

Fall

CHEM 331	Laboratory Methods in Inorganic Chemistry	3
CHEM 335	Physical Chemistry I	3
Hours		6

Spring

CHEM 332	Laboratory Methods in Physical Chemistry	3
CHEM 336	Physical Chemistry II	3

Chemistry Elective (300-level, see text below)	3	
Hours		9
Fourth Year		
Fall		
CHEM 397 or CHEM 398	Undergraduate Research or Undergraduate Research/Senior Capstone Project	3-6
Select one of the following:		3-4
CHEM 328	Introductory Biochemistry I (spring)	
CHEM 329	Biochemistry II: Living Systems (fall)	
BIOC 307	Introduction to Biochemistry: From Molecules To Medical Science	
Hours		6-10
Spring		
Chemistry Elective *		3
Technical Electives *		6
Hours		9
Total Hours		55-59