

CHEMICAL BIOLOGY, BA

Degree: Bachelor of Arts (BA)

Major: Chemical Biology

Program Overview

The BA program in chemical biology is intended for pre-professional students who plan careers in medicine, dentistry, veterinary medicine, pharmacy, or for individuals seeking careers that utilize chemistry to solve problems affecting living systems. A key component of the major is the flexibility imparted by fewer required courses and the integration of six credit hours of technical electives. Many chemical biology BA majors participate in undergraduate research within the Department of Chemistry (CHEM 397 / CHEM 398) or in other science departments, including those in the medical school.

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.

Code	Title	Hours
Required Chemistry Courses		
CHEM 105	Principles of Chemistry I	3
CHEM 106	Principles of Chemistry II	3
CHEM 113	Principles of Chemistry Laboratory	2
CHEM 323	Organic Chemistry I	3-6
or CHEM 223 & CHEM 224	Introductory Organic Chemistry I and Introductory Organic Chemistry II	
CHEM 322	Laboratory Methods in Organic Chemistry *	3-4
or CHEM 233 & CHEM 234	Introductory Organic Chemistry Laboratory I and Introductory Organic Chemistry Laboratory II	
CHEM 306	Biochemistry Laboratory	3
CHEM 328	Introductory Biochemistry I	3
CHEM 301	Introductory Physical Chemistry I	3
or CHEM 335	Physical Chemistry I	
CHEM 304	Quantitative Analysis Laboratory	2
CHEM 310	Foundations of Analytical Chemistry	3
CHEM 398	Undergraduate Research/Senior Capstone Project	3-6
Technical Electives **		6

Additional Required Courses		
BIOL 214	Genes, Evolution and Ecology	3
BIOL 214L	Genes, Evolution and Ecology Lab	1
BIOL 215	Cells and Proteins	3
BIOL 215L	Cells and Proteins Laboratory	1
PHYS 115	Introductory Physics I	4
or PHYS 121	General Physics I - Mechanics	
PHYS 116	Introductory Physics II	4
or PHYS 122	General Physics II - Electricity and Magnetism	
MATH 125	Math and Calculus Applications for Life, Managerial, and Social Sci I	4
or MATH 121	Calculus for Science and Engineering I	
MATH 126	Math and Calculus Applications for Life, Managerial, and Social Sci II	4
or MATH 122	Calculus for Science and Engineering II	
Total Hours		61-68

- * CHEM 322 is offered in spring only, and may be substituted in place of *both* CHEM 233 and CHEM 234. Only one semester of organic chemistry laboratory is required for our chemical biology BA program. However, some medical schools require two semesters of organic lab, so students should plan accordingly.
- ** The technical electives may be chosen more widely from any of the physical sciences, math, or engineering courses. A maximum of 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.

Departmental Honors

Chemistry majors who have excellent academic records may participate in the Honors in Chemistry program. To graduate with honors in chemistry, a student must satisfy the following requirements:

- A combined grade point average of 3.50 in chemistry, physics, and mathematics and an overall grade point average of 3.20
- A minimum of six units of Undergraduate Research (CHEM 397), or chemical research done under another course number with departmental approval
- A thesis approved by the department's undergraduate affairs committee based on the level of research, quality of the manuscript, and chemical content

Sample Plan of Study

First Year		
Fall		Hours
CHEM 105	Principles of Chemistry I	3
Hours		3
Spring		
CHEM 106	Principles of Chemistry II	3
CHEM 113	Principles of Chemistry Laboratory	2
Hours		5

Second Year**Fall**

Select one of the following:	3-6
------------------------------	-----

CHEM 223 & CHEM 224	Introductory Organic Chemistry I and Introductory Organic Chemistry II	
------------------------	---	--

CHEM 323	Organic Chemistry I *	
----------	-----------------------	--

Select one of the following:	3-4
------------------------------	-----

CHEM 233 & CHEM 234	Introductory Organic Chemistry Laboratory I and Introductory Organic Chemistry Laboratory II	
------------------------	---	--

CHEM 322	Laboratory Methods in Organic Chemistry *	
----------	--	--

Hours	6-10
--------------	-------------

Spring

CHEM 306	Biochemistry Laboratory	3
----------	-------------------------	---

CHEM 328	Introductory Biochemistry I	3
----------	-----------------------------	---

Hours	6
--------------	----------

Third Year**Fall**

CHEM 301 or CHEM 335	Introductory Physical Chemistry I or Physical Chemistry I	3
-------------------------	--	---

CHEM 304	Quantitative Analysis Laboratory	2
----------	----------------------------------	---

CHEM 310	Foundations of Analytical Chemistry	3
----------	-------------------------------------	---

Hours	8
--------------	----------

Fourth Year**Fall**

Technical Electives (see text below) *	6
--	---

Hours	6
--------------	----------

Spring

CHEM 398	Undergraduate Research/Senior Capstone Project	3 - 6
----------	---	-------

Hours	3-6
--------------	------------

Total Hours	37-44
--------------------	--------------

* CHEM 322 is offered in spring only, and may be substituted in place of *both* CHEM 233 and CHEM 234. Only one semester of organic chemistry laboratory is required for our chemical biology BA program. However, some medical schools require two semesters of organic lab, so students should plan accordingly.