

Biochemistry Major

72-80 units

The Department of Biology and Chemistry offers an interdisciplinary major in biochemistry (<https://www.apu.edu/clas/programs/biochemistry-major>), which serves premedical students and others who desire a current molecular emphasis in their major. The program contains a basic core of chemistry and biology courses, and courses that are cross-disciplinary in nature, such as biochemistry, physiology, and cell and molecular biology. Students enjoy the freedom to choose biology or chemistry electives while keeping the total major units required for graduation at a reasonable level. This major is especially appropriate for students seeking a career in a laboratory research area such as biotechnology; graduate study in biochemistry or the biological sciences; chemistry, pharmacy, or medical-related studies; or education. The Association of American Medical Colleges (<https://www.aamc.org>) has indicated that biochemistry undergraduates enjoy one of the highest acceptance rates for medical schools of the science major categories.

Note: Entry requirements differ among graduate schools and jobs. Students are responsible to research the requirements of graduate programs and professions in which they are interested.

Requirements

- A student must complete all prerequisites for a BIOC, BIOL, or CHEM course with a C- or better before taking the course (except as noted in the course description).
- A minimum cumulative GPA of 2.0 in all biology, chemistry, biochemistry, math, and physics courses required for the major must be maintained.
- A student must complete each BIOC, BIOL, or CHEM course with a C- or higher for the course to meet a degree requirement in the Department of Biology and Chemistry.

Code	Title	Units
Biology		
BIOL 151	General Biology I ¹	4
BIOL 152	General Biology II	4
BIOL 240	Biology of Microorganisms	4
BIOL 280	Cell Biology	4
Chemistry		
CHEM 151	General Chemistry I ^{1, 2}	4
CHEM 152	General Chemistry II ²	4
CHEM 251	Organic Chemistry - Theory I	4
CHEM 261	Organic Chemistry - Lab	1
CHEM 252	Organic Chemistry: Theory II	4
CHEM 262	Organic Chemistry - Lab	1
Math		
MATH 165	Calculus I	3
MATH 166	Calculus II	3
Physics		
Select one of the following:		8-10
PHYC 151 & PHYC 152	Physics for Life Sciences I and Physics for Life Sciences II ^{1, 2}	
PHYC 161 & PHYC 162	Physics for Science and Engineering I and Physics for Science and Engineering II ^{1, 2}	
Upper-division Requirements		
Required Courses		
BIOC 380	Biochemistry I	4
BIOC 381	Biochemistry II	4
BIOL 496	Writing 3: Ethics and the Sciences ⁴	3
Select one of the following:		4
BIOL 300	Genetics ⁵	
BIOL 410	Molecular Biology	
Electives		

The elective requirement is fulfilled in two parts: List A and List B (see below) 9-12

Total Units 72-77

Code	Title	Units
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List A

Select one of the following:	3-4
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CHEM 300 & CHEM 310	Quantitative Chemical Analysis: Theory and Quantitative Chemical Analysis: Laboratory	
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CHEM 390	Physical Biochemistry	
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CHEM 401 & CHEM 411	Physical Chemistry I and Physical Chemistry I Lab	
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List B

Complete the elective requirement by selecting two from Option I or one each from any two different options.

Option I

Select one or two of the following:	3-8
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CHEM 300 & CHEM 310	Quantitative Chemical Analysis: Theory and Quantitative Chemical Analysis: Laboratory ⁶	
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CHEM 320 & CHEM 330	Instrumental Analysis: Theory and Instrumental Analysis - Lab (Theory/Lab) ⁷	
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CHEM 390	Physical Biochemistry ⁶	
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CHEM 401 & CHEM 411	Physical Chemistry I and Physical Chemistry I Lab ⁶	
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CHEM 402 & CHEM 412	Physical Chemistry II and Physical Chemistry II Lab	
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CHEM 451	Advanced Organic Chemistry	
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CHEM 461	Inorganic Chemistry	
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CHEM 495	Advanced Topics in Chemistry	
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Option II ⁸

Select no more than one of the following:	4
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BIOL 326	Neurobiology	
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BIOL 336	Vertebrate Biology	
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BIOL 346	Regional Human Anatomy	
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BIOL 350	Mammalian Physiology	
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Option III ⁸

Select no more than one of the following:	1-4
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BIOL 498	Directed Research	
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CHEM 498	Directed Research	
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BIOL 395	Science Internship	
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CHEM 395	Chemical Science Internship	
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- 1 Meets the General Education Natural Science requirement.
- 2 This course may be waived with an appropriate Advanced Placement test score.
- 3 Meets the General Education Quantitative Literacy requirement.
- 4 Meets the General Education Writing 3 requirement.
- 5 Premed students should take BIOL 300.
- 6 If not used above as the elective in List A.
- 7 Meets the General Education Writing 3 requirement if both CHEM 320 and CHEM 330 are taken.
- 8 Note that Option II and Option III are valid only if the conditions of List B are met.