

BA in Chemistry

52-54 units

Chemistry is the study of the properties and reactivity of all matter. An understanding of chemistry is fundamental to a variety of fields including but not limited to biology, astronomy, earth science, physics, environmental science, medicine, and pharmacology.

The Bachelor of Arts in Chemistry program (<https://www.apu.edu/clas/programs/chemistry-major/>) provides a strong foundation in general chemistry, organic chemistry, analytical chemistry, and physical chemistry. Additional course requirements provide a foundation in related fields (biology, physics, and mathematics) and opportunity to study other areas within chemistry in greater depth. This major is intended to be paired with a minor such as business management, computer information systems, computer science, mathematics, physics, or political science.

The BA in Chemistry program provides excellent preparation for entry-level positions as a researcher or laboratory technician, in governmental or industrial technical support, in management, or in teaching at the secondary level. Students in this major are strongly encouraged to collaborate with science faculty in a research project or participate in an off-campus internship in industry.

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

All of the following requirements must be met to continue as an allied health, biological sciences, biochemistry, or chemistry major. Failure to maintain these requirements will result in a student being dropped from the major. Reentry to the major is by petition only.

- Maintain a minimum cumulative GPA of 2.0 in all biochemistry, biology, chemistry, math, and physics courses required for the major.
- Must complete each course required for the major with a C- or higher for the course to meet a degree requirement in the Department of Biology and Chemistry.
- Any single course within the major can be taken only two times at APU; students must change to a major outside the department after two unsuccessful (below C-) attempts in a single required course.
- Only two courses total within the major can be repeated; students must change to a major outside the department after unsuccessful (below C-) attempts in any three required courses.

Code	Title	Units
Biology		
BIOL 151	General Biology I ¹	4
BIOL 496	Writing 3: Ethics and the Sciences ²	3
Chemistry		
CHEM 151	General Chemistry I ³	4
CHEM 152	General Chemistry II ⁴	4
CHEM 251 & CHEM 261	Organic Chemistry: Theory I and Organic Chemistry - Lab	4
CHEM 252 & CHEM 262	Organic Chemistry: Theory II and Organic Chemistry - Lab	4
CHEM 300 & CHEM 310	Quantitative Chemical Analysis - Theory and Quantitative Chemical Analysis - Laboratory	4
CHEM 401	Physical Chemistry I	3
Mathematics		
MATH 165	Calculus I ⁴	3
MATH 166	Calculus II ⁴	3
Physics		
PHYC 145	Physics Laboratory I ³	1
PHYC 146	Physics Laboratory II	1
Select one of the following course pairs:		6-8
PHYC 155 & PHYC 156	Physics for Life Sciences I and Physics for Life Sciences II ³	
PHYC 165 & PHYC 166	Physics for Science and Engineering: Mechanics and Physics for Science and Engineering: Electricity and Magnetism ³	

Electives

Select at least 8 units from the following:

8

BIOL 152 or BIOC 270	General Biology II Biomolecular Chemistry
CHEM 311	Teaching and Learning in STEM ⁵
CHEM 312	STEM Education Research Seminar ⁵
CHEM 313	STEM Teaching Practicum ⁵
CHEM 320 & CHEM 330	Instrumental Analysis: Theory and Instrumental Analysis - Lab ⁶
CHEM 394	Directed Research Internship ⁵
CHEM 395	Chemical Science Internship ⁵
CHEM 411	Physical Chemistry I Lab
CHEM 402	Physical Chemistry II
CHEM 412	Physical Chemistry II Lab
CHEM 461	Inorganic Chemistry
CHEM 495	Advanced Topics in Chemistry
MATH 268	Multivariable Calculus

Total Units**52-54**¹ Meets the General Education Natural Sciences requirement.² Meets the General Education Writing 3 requirement.³ CHEM 151, PHYC 145, PHYC 155, and PHYC 165 meet the General Education Natural Sciences requirement and may be waived with an appropriate Advanced Placement test score.⁴ This course may be waived with an appropriate Advanced Placement test score.⁵ Up to 3 units combined of CHEM 311, CHEM 312, CHEM 313, CHEM 394, and CHEM 395 may count toward major elective units.⁶ CHEM 320 and CHEM 330 meet the General Education Integrative and Applied Learning requirement.**Program Learning Outcomes****Program Learning Outcomes**

Students who successfully complete this program shall be able to:

1. Demonstrate a broad knowledge base in the field of chemistry.
2. Effectively communicate scientific ideas and research orally.
3. Effectively communicate scientific ideas and research in writing.
4. Demonstrate proficiency in problem solving and applying the scientific method to scientific questions.
5. Demonstrate laboratory skills and techniques.
6. Demonstrate knowledge of relevant laboratory instrumentation.
7. Express a Christian worldview that integrates faith with their chemistry vocation.