

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

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|-------------------------|---|
| 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.