

Bachelor of Science in Chemistry

The Bachelor of Science in Chemistry program is certified by Committee on Professional Training of the American Chemical Society. It is designed for the student who plans a career in chemistry or a related field upon graduation or plans to go on to graduate school in the chemical sciences.

It is also an option for students interested in medicine, pharmaceutical sciences, clinical laboratory science, forensics, environmental science, as well as industries such as petrochemicals, instrumentation, food, nutraceuticals, or cosmetics. The program provides foundational course work in the sub-disciplinary areas of organic, inorganic, physical, analytical, and biochemistry with cognate course work in biology, mathematics and physics. A concentration in biochemistry or chemistry is required.

The chemistry option requires in-depth courses in instrumental analysis, an inorganic chemistry lab, materials or polymer chemistry, one upper-division chemistry elective, and completion of a senior project. The biochemistry option requires additional biology and biochemistry course and laboratory work, and may be more appropriate for students interested in the biotech industry, medical, or pharmacy school.

Note the following: BS Chemistry majors pursuing a Chemistry Concentration will fulfill the Upper Division Scientific Inquiry GE B5 requirement by taking the following courses: CHEM 3200, CHEM 4550, and either CHEM 5850 or CHEM 5860.

BS Chemistry majors pursuing a Biochemistry Concentration will fulfill the Upper Division Scientific Inquiry GE B5 requirement by taking the following courses: CHEM 3200, CHEM 4750, and CHEM 5700.

Requirements (80-81 units)

Total units required for graduation: 120

Requirements for the B.S. Chemistry

Lower-division requirements (37)

| | | |
|------------|---------------------------------|---|
| BIOL 2010 | Principles of Biology I | 5 |
| CHEM 2100 | General Chemistry I | 4 |
| CHEM 2100L | General Chemistry I Laboratory | 1 |
| CHEM 2200 | General Chemistry II | 4 |
| CHEM 2200L | General Chemistry II Laboratory | 1 |
| MATH 2210 | Calculus I | 4 |
| MATH 2220 | Calculus II | 4 |
| MATH 2310 | Applied Linear Algebra | 4 |
| PHYS 2500 | General Physics I | 4 |
| PHYS 2500L | General Physics I Lab | 1 |
| PHYS 2510 | General Physics II | 4 |
| PHYS 2510L | General Physics II Lab | 1 |

Upper-division requirements (19)

| | | |
|-----------|------------------------------------|---|
| CHEM 3200 | Quantitative Analysis | 4 |
| CHEM 3400 | Principles of Organic Chemistry I | 5 |
| CHEM 3500 | Principles of Organic Chemistry II | 5 |

Note: The organic chemistry requirement may be met with the following five courses (13 units) instead of CHEM 3400 and CHEM 3500:

| | | |
|------------|---|---|
| CHEM 2400 | Organic Chemistry I Lecture | |
| CHEM 2400L | Organic Chemistry I Laboratory | |
| CHEM 2500 | Organic Chemistry II | |
| CHEM 2500L | Organic Chemistry II Laboratory | |
| CHEM 3600 | Intermediate Organic Chemistry | |
| CHEM 4100 | Biochemistry I | 3 |
| CHEM 4100L | Biochemistry I Laboratory | 1 |
| CHEM 5800 | Chemistry Seminar | 1 |
| CHEM 5990 | Undergraduate Comprehensive Examination | 0 |

Select one of the following two concentrations to complete the major (24-25) **24 or 25**

Total Units **80-81**

Concentrations (24-25 units)

Chemistry Concentration (24-25 units)

(Program Code: CHEM)

Choose one of the following: **3 or 4**

| | | |
|-----------|---|---|
| MATH 2270 | Differential Equations with Dynamical Systems I | |
| MATH 2320 | Multivariable Calculus | |
| CHEM 4300 | Inorganic Chemistry | 4 |
| CHEM 4400 | Physical Chemistry I | 3 |
| CHEM 4500 | Physical Chemistry II | 3 |
| CHEM 4550 | Physical Chemistry Laboratory | 1 |

Choose one of the following: **2**

| | | |
|-----------|-----------------------|---|
| CHEM 5100 | Polymer Science | |
| CHEM 5150 | Materials Chemistry | |
| CHEM 5200 | Instrumental Analysis | 5 |

Choose one of the following: **1**

| | | |
|-----------|---------------------------|--|
| CHEM 5850 | Chemistry Senior Project | |
| CHEM 5860 | Chemistry Senior Research | |

Elective: Choose at least 2 units from the following list: **2**

| | | |
|------------|--------------------------------|--|
| CHEM 4200 | Biochemistry II | |
| CHEM 5001 | Topics in Chemistry | |
| CHEM 5001L | Topics in Chemistry Laboratory | |
| CHEM 5002 | Topics in Chemistry | |
| CHEM 5300 | Environmental Chemistry | |
| CHEM 5320 | Atmospheric Chemistry | |
| CHEM 5400 | Chemistry of the Elements | |
| CHEM 5410 | Solid State Chemistry | |
| CHEM 5420 | Pyrotechnics | |
| CHEM 5500 | Medicinal Chemistry | |
| CHEM 5550 | Computational Chemistry | |
| CHEM 5751 | Internship in Chemistry | |
| CHEM 5752 | Internship in Chemistry | |
| CHEM 5753 | Internship in Chemistry | |
| CHEM 5901 | Directed Laboratory Research | |
| CHEM 5902 | Directed Laboratory Research | |
| CHEM 5903 | Directed Laboratory Research | |
| CHEM 5951 | Independent Study | |

| | |
|--|-------------------|
| CHEM 5952 | Independent Study |
| CHEM 5953 | Independent Study |
| Additionally either CHEM 5100 or 5150 may be taken to meet this requirement provided that this course was not taken to satisfy an above requirement. | |
| Total Units | 24-25 |

Biochemistry Concentration (25 units)

(Program Code: CBIO)

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|--|---|-----------|
| BIOL 2020 | Principles of Biology II | 5 |
| Choose one upper-division biology course from the following: | | 4 |
| BIOL 3100 | Cell Biology | |
| BIOL 3120 | Molecular Biology | |
| BIOL 3200 | Microbiology | |
| BIOL 3300 | Genetics | |
| CHEM 4200 | Biochemistry II | 3 |
| CHEM 4200L | Biochemistry II Laboratory | 1 |
| CHEM 4350 | Bioinorganic Chemistry | 3 |
| CHEM 4600 | Physical Chemistry for Biochemists I | 3 |
| CHEM 4700 | Physical Chemistry for Biochemists II | 3 |
| CHEM 4750 | Physical Chemistry for Biochemists Laboratory | 1 |
| CHEM 5700 | Biochemistry III Laboratory | 2 |
| Total Units | | 25 |