

Chemistry Major

(13.75 units)

1. Nine and three-quarter departmental units:
 - a. Nine units from this list, with at least 1 unit from each of the five branches of chemistry. Chemistry 117 may be used as 1 of the 9 units.
 - i. Analytical Chemistry: 220, 225
 - ii. Organic Chemistry: 230, 235
 - iii. Physical Chemistry: 240, 245
 - iv. Inorganic Chemistry: 150, 250
 - v. Biochemistry: 260, 300
 - b. Seminars: Chemistry 280 (.25) and 380 (.5).
2. Four supporting units:
 - a. Mathematics 110, 113, or 115
 - b. Physics 101 or 102
 - c. Two additional units selected from Mathematics 106, 115, 175; Physics 102, 206, 210; one 100-level biology course; Biology 247; or Computer Science.
3. In preparation for graduate study in chemistry, as much mathematics, physics, and additional chemistry as possible, and at least one summer or semester of full-time research experience are strongly recommended.
4. Writing/communication requirement: Chemistry majors require multiple skills in writing and communication—general, technical, and laboratory writing; public, class, and professional speaking; computer skills for analysis and visualization of data, simulations, and modeling.
 - a. Chemistry 117 introduces students to chemistry by having them write laboratory notebooks and formal scientific reports and give oral presentations of their research results.
 - b. Chemistry 280, Professional Tools for Scientific Careers, covers specific communications skills required by chemistry professionals, including résumé preparation, job searching and interview skills, as well as scientific ethics and issues, and participating in peer review.
 - c. Chemistry 380, Chemistry Seminar, provides multiple opportunities to present topical scientific seminars and to evaluate

seminars given by peers, and culminates in a departmental presentation that includes synthesis of a body of work selected by the student.

5. Computer analysis and data visualization: Computer skills are essential for data acquisition, analysis and visualization, simulations of molecular processes, and molecular modeling. Excel-based spreadsheets and macros and specialized computation and visualization tools are used throughout the curriculum.

Applied Chemistry Major

(13.75 units)

1. Seven and three-quarter departmental units:
 - a. Seven units from this list, with at least 1 unit from each of four of the five branches of chemistry. Chemistry 117 may be used as 1 of the 7 units.
 - i. Analytical Chemistry: 220, 225
 - ii. Organic Chemistry: 230, 235
 - iii. Physical Chemistry: 240, 245
 - iv. Inorganic Chemistry: 150, 250
 - v. Biochemistry: 260, 300
 - b. Seminars: Chemistry 280 (.25) and 380 (.5).
2. Six supporting units:
 - a. Mathematics 110, 113, or 115
 - b. Physics 101 or 102
 - c. 4 additional units in a complementary discipline as approved by petition to the department chair.
3. In preparation for graduate study in chemistry, as much mathematics, physics, and additional chemistry as possible and at least one summer or semester of full-time research experience are strongly recommended.
4. Writing/Communication requirement: *See chemistry major.*
5. Computational analysis and data visualization: *See chemistry major.*

Biological Chemistry Major

(14.75 units)

1. Eight and three-quarter departmental units:
 - a. Chemistry 117, 220, 230, 235, 260, and 300.
 - b. Two additional units with at least 1 unit from each of the remaining branches:
 - i. Chemistry 240 or 245
 - ii. Chemistry 150 or 250.
 - c. Seminars: Chemistry 280 (.25) and 380 (.5).
2. Six supporting units:
 - a. Mathematics 110 or 113, and 115.
 - b. Physics 101 and either 102 or 210.
 - c. Biology 110, 111, 121, 141, or 151.
 - d. Biology 237, 248, 289, or 345.
3. In preparation for graduate study in chemistry, as much mathematics, physics, and additional chemistry as possible and at least one summer or semester of full-time research experience are strongly recommended.
4. Writing/Communication requirement: *See chemistry major.*
5. Computational analysis and data visualization: *See chemistry major.*

Environmental Chemistry Major

(13.75 units)

1. Six and three-quarter departmental units:
 - a. Six units from this list, with at least 1 unit from each of four of the five branches of chemistry. Chemistry 117 may be used as 1 of these 6 units.
 - i. Analytical Chemistry: 220, 225
 - ii. Organic Chemistry: 230, 235
 - iii. Physical Chemistry: 240, 245
 - iv. Inorganic Chemistry: 150, 250
 - v. Biochemistry: 260, 300
 - b. Seminars: Chemistry 280 (.25) and 380 (.5).
2. Seven supporting units:
 - a. Mathematics 110, 113, or 115
 - b. Physics 101 or 102
 - c. Biology 206 or 372
 - d. Geology 100 or 110
 - e. 3 additional units from economics,

environmental studies, interdisciplinary studies, or political science, approved by petition to the department chair.

3. In preparation for graduate study or employment in environmental science, additional science, mathematics, and social science courses and at least one summer or semester of experience in an environmental internship or program are strongly recommended.
4. Writing/Communication requirement: *See chemistry major.*
5. Computational analysis and data visualization: *See chemistry major.*

American Chemical Society Certification

Beloit College is approved by the American Chemical Society for the undergraduate professional training of chemists. Certification by the society requires:

1. All requirements of the chemistry or biological chemistry major, with the following changes:
 - a. Mathematics 115, Physics 102 (chemistry major).
 - b. Additional laboratory experience:
 - i. One course from Chemistry 370, 375, 390, with laboratory work.
 - ii. Field term or internship with laboratory work and comprehensive written report.

Biochemistry Major

(14 units)

See biochemistry in the catalog.

Chemistry Minor

(5.25 units)

1. Five units selected from Chemistry 117 or the five branches of chemistry. *See chemistry major.*
2. Chemistry 280 (.25).