

Biochemistry Major

(13.75 units)

1. Nine and three-quarter units:

- a. Chemistry 117, 220, 230, and 235.
- b. Biology 110, 111, 121, 141, 151, or 172.
- c. Biology 247 and 289.
- d. Biology/Chemistry 260 and 300.
- e. Chemistry 280 (.25) and either Chemistry 380 (.5) or Biology 385 (.5) or 387 (.5 or 1).

2. Four supporting units:

- a. Mathematics 110, 113, or 115.
- b. Physics 101 or 102.
- c. Two additional units selected from biology, chemistry, mathematics, and physics.
(Students select these additional units in consultation with an advisor. Students intending to attend graduate school are strongly encouraged to take Chemistry 240. Students intending to attend medical school are strongly encouraged to take Physics 102.)

3. Writing/communication requirement:

Biochemistry requires skills in oral and written communication. General, technical, and laboratory report writing are skills developed in each class. Public, class, and professional speaking skills are developed through class presentations, Beloit College symposia, and presentations at scientific meetings. Beloit College biochemistry students construct their knowledge of biochemical processes through gathering, organizing, and critically analyzing information. Additionally, students learn to present their research logically and persuasively. Core courses within the biochemistry major that may be used to satisfy a portion of the Beloit College writing requirement include: Chemistry 117 and 235 and Biology 247 and 387.

In addition, the major offers seminars and capstone experiences that focus on writing and communication. Chemistry 280 covers specific communication skills required by chemistry professionals, including résumé preparation, job searching and interview skills, scientific ethics and issues, and participating in peer review. Chemistry 380 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. Biology 385 is a capstone course that explores an area of biology deeply through careful reading and analysis of the research literature and/or primary investigation. It includes oral presentations, writing, and peer review and culminates in the writing of a critical review or research manuscript. Biology 387 is a capstone experience in which students prepare a primary research manuscript or critical review for submission to the departmental journal, *The Beloit Biologist*, under the mentorship of a faculty member.

4. Computer analysis and data visualization:

Computer skills are essential for data acquisition, analysis and visualization, simulations of biomolecular processes, and molecular modeling. Computer programs and software supplement and enhance the skills for oral and written communication in biochemistry. Excel-based spreadsheets and macros are used throughout the curriculum. Students also learn to use specialized computation and visualization tools including ChemDraw, Spartan, Gaussian, and Protein Data Bank molecular viewers.