

Fields of Concentration

The biology department offers students the opportunity to pursue a broad background in biology and the supporting sciences through any of four concentrations. Each student electing a field of concentration in biology must complete a 3-course core sequence, a 4-course breadth sequence, 3 courses in chemistry and mathematics, and a capstone course. In addition, students take other courses specific to their chosen concentrations in biology, and some of the concentrations stipulate the introductory or breadth courses to be taken. With proper arrangements, courses taken at other institutions, including at field stations, can satisfy certain course requirements.

Note: Students intending to elect a concentration in biology or to pursue a health profession should complete an appropriate 100-level biology course, Chemistry 117 or 150, and one other required course in science or mathematics during their first two semesters. Such students should consult with a member of the biology department as soon as possible.

Note: Students majoring in biology may choose either the Bachelor of Arts or the Bachelor of Science degree. Students anticipating graduate study or a medical career are urged to include Chemistry 117 or 150, 220, 230, 235; Mathematics 110, 115; and Physics 101, 102 in their undergraduate preparation. Additional courses (e.g. Chemistry 240, 245, 300 and Mathematics 175) may be appropriate for graduate work in biology. Many graduate schools and some professional schools require knowledge of a foreign language (e.g. Spanish, French, German, Japanese, or Russian) for admission to their programs. Depending on the specific goal of the student and the requirements of potential professional or graduate programs, various additional courses in the sciences and other departments may be relevant and appropriate. In some cases course substitutions may be permitted, with approval of the biology advisor and chair of the biology department.

Biochemistry Major

(14 units)

See biochemistry in the catalog.

Ecology, Evolution, and Behavioral Biology

(14 ½ units)

The ecology, evolution, and behavioral biology major provides a broad background in biology with a focus on how organisms evolve and interact with their biological and physical environments.

- 1) Ten and one-half departmental units:
 - a) Two organismal biology courses: chosen from Biology 110 or 111; and 121, 141, or 151.
 - b) Biology 247, 289, and 385 or 387.
 - c) Four ecology, evolution, and behavioral biology units (at least 1 unit of biology at the 300-level): 1 chosen from Biology 210, 217, 291** or 385**; 1 chosen from Biology 291**, 337, 372, 385**, or Anthropology 324; one chosen from Biology 291**, 343, 385**, or Anthropology 260; and 1 additional unit chosen from Biology 206, 210, 215, 217, 291**, 337, 343, 372 or 385**.
 - d) Two molecular, cellular, and integrative biology units chosen from Biology 237, 248, 260, 265, 291**, 300, 340, 345, 357, or 385**.
- 2) Supporting courses (4 units):
 - a) Two chemistry courses chosen from Chemistry 117* or 150, and 220, 230, or 235.
 - b) One mathematics course chosen from Mathematics 104 or 110.
 - c) One geology or physics course chosen from Geology 100, 105, 110, or Physics 101.

- 3) Writing/communication requirement: The biology department has designed its writing experiences in a developmental sequence to enhance each biology major's ability to write effectively. We use writing assignments throughout our curriculum to facilitate and assess student learning; our students write to learn and learn to write. Biology majors take at least 3 writing-designated units, which are otherwise required for the major, to satisfy a portion of the Beloit College writing requirement. The biology department offers the following writing courses: 201, 206, 215, 217, 247, 248, 289, 300, 337, 340, 343, 357, and 372.
- 4) There are two options for the capstone experience for biology and biochemistry majors: Biology 385, a topically focused course in which students read the current literature on a topic, discuss and debate it, and write a culminating, peer-reviewed manuscript, or Biology 387, a faculty-mentored independent study in which the student writes a critical review or primary research manuscript. Students may submit their manuscripts for publication in *The Beloit Biologist*, the department's in-house journal. *The Beloit Biologist* is distributed to biology and biochemistry majors at the end of the spring semester.

**Students with strong high school backgrounds in chemistry should consult with a member of the chemistry department about beginning course work with Chemistry 150, 220, or 230.*

***Biology 291 and 385 may be used to satisfy this requirement with appropriate course content and advisor approval.*

Note: No course may satisfy two requirements.

Environmental Biology

(14 ½ units)

The environmental biology major provides a broad background in biology with a focus on how humans interact with their biological and geological environments.

- 1) Eight and ½ departmental units:

- One organismal biology course chosen from Biology 110, 111, 121, 141, or 151.
- Biology 247, 289, and 385 or 387.
- Three ecology, evolution, and behavioral biology courses (at least 1 unit of biology at the 300-level) chosen from Biology 206, 210, 215, 217, 291**, 337, 343, 372, or 385**.
- Two molecular, cellular, and integrative biology units chosen from Biology 237, 248, 260, 265, 291**, 300, 340, 345, 357, or 385**.

- 2) Supporting courses (6 units):

- Two chemistry courses chosen from Chemistry 117* or 150, and 220, 230, or 235.
- One mathematics course chosen from Mathematics 104 or 110.
- Two units in geology: 1 chosen from Geology 100 or 110; and 1 chosen from Geology 235, 240, or 251.
- One unit in economics, environmental studies, interdisciplinary studies, political science, or other course chosen in consultation with the advisor.

- 3) Writing/communication requirement: *See Ecology, Evolution, and Behavioral Biology.*

**Students with strong high school backgrounds in chemistry should consult with a member of the chemistry department about beginning course work with Chemistry 150, 220, or 230.*

***Biology 291 and 385 may be used to satisfy this requirement with appropriate course content and advisor approval.*

Note: No course may satisfy two requirements.

Mathematical Biology

(14 ½ units)

The mathematical biology major provides a broad background in mathematics and biology, with a focus on mathematical approaches and models of living systems.

- 1) Eight and ½ departmental units:

- One organismal biology course chosen from Biology 110, 111, 121, 141, or 151.
- Biology 247, 289, and 385 or 387.

- c) Two ecology, evolution, and behavioral biology units (at least 1 unit of biology at the 300-level): one chosen from Biology 206, 210, 215, 217, 291**, 343, 385** and one chosen from Biology 291**, 337, 372, or 385**.
- d) Two molecular, cellular, and integrative biology units chosen from Biology 237, 248, 260, 265, 291**, 300, 340, 345, 357, or 385**.
- e) One additional biology unit above Biology 201.

2) Supporting courses (6 units):

- a) Two chemistry units chosen from Chemistry 117* or 150, and 220, 230, 235, or 240.
- b) Mathematics 110 and 115.
- c) One unit from Mathematics 160, 175, or 200.
- d) One unit of computer science or mathematics chosen from Computer Science 121, 123, 125, 131, and any full unit mathematics course above 115.

3) Writing/communication requirement: *See Ecology, Evolution, and Behavioral Biology.*

**Students with strong high school backgrounds in chemistry should consult with a member of the chemistry department about beginning course work with Chemistry 150, 220, or 230.*

***Biology 291 and 385 may be used to satisfy this requirement with appropriate course content and advisor approval.*

Note: No course may satisfy two requirements.

Molecular, Cellular, and Integrative Biology

(14 ½ units)

The molecular, cellular, and integrative biology major provides a broad background in the sciences with a focus on the molecular, cellular, and integrative mechanisms by which organisms regulate life processes.

1) Eight and ½ departmental units:

- a) One introductory biology unit chosen from Biology 110, 111, 121, 141, or 151.
- b) Biology 247, 289, and 385 or 387.

- c) Two ecology, evolution, and behavioral biology units chosen from Biology 206, 210, 215, 217, 291**, 337, 343, 372, or 385**.
- d) Three molecular, cellular, and integrative biology units: 1 chosen from Biology 237, 248, 291** or 385**; 1 chosen from 260, 291**, 300, 345, or 385**; and 1 chosen from 265, 291**, 340, 357, or 385**.

2) Supporting courses (6 units):

- a) Two chemistry units chosen from Chemistry 117* or 150, 230, or 235.
- b) Mathematics 110.
- c) Physics 101.
- d) Two units chosen from Chemistry 220, 230, 235, 240, 245, 260, 300**, Mathematics 115, Physics 102 or 210.

3) Writing/communication requirement: *see Ecology, Evolution, and Behavioral Biology.*

**Students with strong high school backgrounds in chemistry should consult with a member of the chemistry department about beginning course work with Chemistry 150, 220, or 230.*

***Biology 291 and 385 may be used to satisfy this requirement with appropriate course content and advisor approval.*

Note: No course may satisfy two requirements.

Note: Students anticipating careers in the health professions are strongly encouraged to complete 2 units in literature and composition, Sociology 275, and Philosophy 221.

The following minor is not open to majors in biology, biological chemistry, biochemistry, or applied chemistry (with biology as a complementary discipline).

Biology Minor

(5 ½ units)

The biology minor focuses on the mechanisms by which organisms regulate life processes, grow and develop, reproduce, and behave. The minor requires 4.5 units representing 100-, 200-, and 300-levels in the biology curriculum, as well as 1 supporting unit in another science or mathematics.

- 1) Four and one-half departmental units:
 - a) One unit from Biology 110, 111, 121, 141, or 151.
 - b) Three and one-half units from Biology 201, 206, 210, 215, 217, 237, 247, 248, 260, 265, 289, 291, 300, 337, 340, 343, 345, 357, 372, or 385.

- 2) Supporting course (1 unit)
 - a) One unit from Chemistry, Geology, Physics, Mathematics, or Computer Science.