

Biology

View Biology Department website

The discipline of biology is extremely broad and deep. The curriculum in biology reflects this breadth with offerings ranging from introductory courses for biology majors and non-majors to advanced instruction in the various sub-disciplines in biology. Depth is provided within the biology major by courses that focus on progressively more specific aspects of selected subject areas within biology. The primary goal of the program in biology is to provide students with a broad background suitable for future work in any area of biology or in related fields. In the junior and senior years, students have the opportunity to deepen this general background or to begin specialization in various areas such as aquatic biology, plant biology, cellular and molecular biology, ecology, premedical and pre-professional studies, and zoology.

Furthermore, the sequential and developmental nature of the biology program emphasizes skills and techniques that are used to complete St. Mary's Projects. Through a careful choice of courses, made in collaboration with their faculty advisers, students may prepare themselves for secondary school teaching, for graduate work in biology or related areas, for careers as professional biologists in laboratories or field stations, for work in environmental studies or conservation, and for professional training in health and medicine-related fields. The location of the College on the St. Mary's River, a sub-estuary of the Chesapeake Bay, provides excellent opportunities for field studies in aquatic biology. Other research opportunities are available in laboratories at St. Mary's College and, through the internship program, at government and privately funded research laboratories in Maryland and elsewhere. A cooperative agreement between the College and the University of Maryland's Center for Environmental Science provides opportunities for St. Mary's College students to take special seminars and conduct research with faculty members at the nearby Chesapeake Biological Laboratory in Solomons. Each student is encouraged to participate in field and/or laboratory research in the biological sciences through independent study, internships, or St. Mary's Projects. Biology students are expected to take seriously the opportunity to become broadly educated in the liberal arts. To earn a bachelors of science degree with a major in

biology, a student must satisfy the following minimum requirements.

Learning Outcomes

- Demonstrate a thorough knowledge of the theories, principles, and/or literature relevant to the biological subdiscipline
- Use core concepts to explain biological processes found in the biosphere
- Design experiments using the scientific method to address a biological problem
- Develop a curated bibliography from the scientific literature that supports a line of inquiry in the biological sciences
- Construct questions based upon analysis of primary literature in the biological sciences
- Construct an organized written product and deliver an organized oral presentation that convey scientific information at a level appropriate to the audience

Degree Requirements for the Major

General College Requirements

General College Requirements (see Curriculum section), including the following requirements to satisfy the major

Course Requirements

Physical Science Courses (12 credit hours)

- CHEM 103: General Chemistry
- CHEM 106: General Chemistry II
- CHEM 311: Organic Chemistry I
- In addition to those three courses, Organic Chemistry II (CHEM 312), College Physics (PHYS 121, 122) or General Physics (PHYS 141, 142) and Calculus I and II (MATH 151, 152) are recommended for all students and are required by most graduate and professional schools.

Biology Core Courses (16 credit hours)

- BIOL 105: Principles of Biology I
- BIOL 106: Principles of Biology II
- BIOL 270: Genetics
- BIOL 271: Ecology and Evolution

Biology Core Laboratories (4 credit hours)

- BIOL 105L: Principles of Biology I Lab
- BIOL 106L: Principles of Biology II Lab
- BIOL 270L: Genetics Lab
- BIOL 271L: Ecology and Evolution Lab

Elective Courses:

- A minimum of 16 credit hours in upper-level biology courses is required, excluding Laboratory Teaching Assistant (BIOL 307), Internship (BIOL 398, 498), and Independent Study (BIOL 399, 499). The second four credit hours of a St. Mary's Project in biology (BIOL 494) may be counted toward the total 16 credit hours. Of the 16 credit hours, at least eight, not including the St. Mary's Project, must include a laboratory component. At least eight of the 16 upper-level credits as well as the St. Mary's Project must be taken at the College.

St. Mary's Project

Every biology major must complete a St. Mary's Project.

This project may be in biology or in another major discipline or a study area. The guidelines established in the elected area apply. The project must be proposed to a mentor and to the chair of the Department of Biology at least three weeks before the last day of classes of the second semester of the student's junior year, and it must be approved by the mentor and the department chair.

Minimum Grade and GPA Requirements

Students must earn a grade of C- or better in the chemistry courses listed under Physical Science Courses. Students must earn a grade of C or better in each biology courses listed above and all prerequisites for these courses must be met with a grade of C or better.

At least half of the credits required for the major must be taken at the College.

Upper-Level Biology Courses

A liberal arts education in biology should include both the breadth of the subject and its depth. While students may wish to focus on one particular area of biology, such as aquatic biology or plant biology, we strongly advise them to be sure that their advanced coursework includes at least one course from each of three levels of biological organization: population/community/eco-system, organismal and cellular/biochemical levels. Please note, though, that these categories are somewhat artificial because many of our courses are designed to integrate material from more than one level of organization or taxonomic

kingdom. For example, microbiology bridges ecology and molecular biology of bacteria, and photobiology discusses responses of organisms from several kingdoms to a critical environmental factor, light, addressing questions at all three levels of organization. Such courses may be especially useful in helping students gain an integrated view of biology that will enable them to pose and solve complex or interdisciplinary questions. In addition, students should expose themselves to biodiversity by taking care not to concentrate solely on one group of organisms: for example, plants or animals.

Population/Community/Eco-system-Level Courses

- BIOL 316: Tropical Biology
- BIOL 432: Limnology
- BIOL 463: Ecology of Coastal Systems

Organismal-Level Courses

- BIOL 303: Invertebrate Zoology
- BIOL 305: Animal Behavior
- BIOL 330: Human Anatomy and Physiology
- BIOL 384: Sensory Biology
- BIOL 387: Ichthyology
- BIOL 401: Developmental Biology
- BIOL 435: Plant Physiology
- BIOL 436: Comparative Animal Physiology

Cellular/Biochemical-Level Courses

- BIOL 359: Photobiology
- BIOL 360: Microbiology
- BIOL 418: Virology
- BIOL 419: Neurobiology
- BIOL 425: Biochemistry II
- BIOL 438: Cancer Cell Biology
- BIOL 470: Immunology
- BIOL 471: Molecular Biology
- BIOL 472: Molecular Evolution

Sequence of Study

The following sequence of courses is a typical model for the fulfillment of the requirements

for the major:

- First Year:

Core Curriculum requirements, BIOL 105, BIOL 106, CHEM 103 (or satisfactory completion of the Chemistry Placement Exam), CHEM 106

- Sophomore Year:

Core Curriculum requirements, BIOL 270, BIOL 271, CHEM 311, CHEM 312* MATH 151*, MATH 152*

- Junior Year:

Core Curriculum requirements, biology electives, PHYS 121*, PHYS 122*

- Senior Year:

Biology electives, St. Mary's Projects (BIOL 493 and 494).

**optional but recommended course requirements for teacher certification*

Degree Requirements for the Minor

Required Core Courses

Core (16 credit hours)

- BIOL 105: Principles of Biology I
- BIOL 106: Principles of Biology II
- BIOL 270: Genetics
- BIOL 271: Ecology and Evolution

Core Labs (4 credit hours)

- BIOL 105L: Principles of Biology I Lab
- BIOL 106L: Principles of Biology II Lab
- BIOL 270L: Genetics Lab
- BIOL 271L: Ecology/Evolution Lab

Elective Courses (4 credit hours)

- At least four credit hours in upper division biology (BIOL) courses excluding Laboratory Teaching Assistant (BIOL 307), Internship (BIOL 398, 498), and Independent Study (BIOL 399, 499).

Minimum Grade and GPA Requirements

Students must earn a grade of C or better in each required course taken to fulfill the minor,

and all prerequisites for these courses must be met with a grade of C or better.

Requirements for Teacher Certification

A Master of Arts in Teaching program is available at St. Mary's College of Maryland after completion of the baccalaureate degree. Students who are interested in becoming teachers should contact the chair of the Department of Educational Studies or an education adviser in their major field of study for suggested coursework in educational studies and their specific major. These consultations should take place during the first semester of the sophomore year.

Faculty

Emily Brownlee, Jeffrey J. Byrd , Karen Crawford, , Kevin J. Emerson, Tom Evans (visiting), Sean Hitchman (visiting), Rose Keith (visiting), Sarah Latchney, Jeff Lombardo (visiting), Jessica Malisch, Rachel Myerowitz, J. Jordan Price (Dept. Chair), Steve Raiker (visiting)