Biology

Biology is the science that studies the processes fundamental to all forms of life. Biology strives to answer questions such as: How do biochemical processes control a cell’s behavior? How do organisms grow and reproduce? How do pollutants threaten certain life forms? How can human life be sustained and lengthened by medical advances?

The biology major is designed to expose students to a broad base of biological knowledge, to provide depth of experience in advanced topics, and to develop competence in scientific disciplines that are supportive of the life sciences (mathematics, physics and chemistry). The biology major is a stepping stone from which students may go into research, various health professions, teaching, business, or service in government or independent agencies.

On completing the biology major, students will be able to:

• Explain major biological concepts at all levels within the discipline and discuss how these are connected with various areas of the biological and physical sciences.
• Demonstrate problem solving, analytical and communication skills that provide fluency within and command of the discipline, and that will provide the foundation for lifelong learning and career development.
• Value biology as an integral part of society and everyday life.

Pursuing Biology at Ohio State

High school students planning to major in biology are advised to acquire a strong background in math and science (biology, chemistry and physics). Enriched, advanced or honors courses, courses with an associated laboratory, and research experience are encouraged. Good written and oral communication skills are also important.

All freshman applicants to the Columbus campus are considered within a competitive admission process; find admissions criteria at go.osu.edu/admissions. Upon admission to the university, students can declare a major in biology within the Arts and Sciences.

Biology Requirements

The biology major consists of a minimum of 32 semester hours of biological sciences courses at the 2000 level or above. Three courses must be laboratory courses or must include a laboratory component.

Course work for the biology major comprises the following three components, chosen in consultation with a biology advisor to meet the individual student’s interests and needs.

• Core requirement: Biology 3401, Integrated Biology
• Specialization options: education in the life sciences, forensic biology, pre-health professions
• Electives in the major

A full description of the biology major is available from the Center for Life Sciences Education at clse.osu.edu.

Not included in the biology major, but required by it, are courses that provide a basic understanding of the sciences upon which biological sciences are built. All biology majors complete mathematics through differential calculus, one semester of mathematical modeling or statistics for life sciences, and one year each of general chemistry, organic chemistry with laboratory, general physics and general biology.

These basic math and science requirements of the biology major are nearly identical with the requirements of pre-medicine, pre-optometry, pre-dentistry and pre-veterinary medicine. Biology majors are among the most broadly educated science students, preparing them for diverse science-related careers.

Co-Curricular Opportunities

Undergraduate research

Because no other learning experience can match the value of a hands-on research project, students in the biology major are encouraged to engage in undergraduate research opportunities. Such opportunities allow students to develop their scientific curiosity and to discover if a career in research is a good fit. Biology students may choose to work with a faculty member in the biological sciences or they may work in labs in other departments and colleges. Learn more at uro.osu.edu.

Student organizations

Several departmental undergraduate student clubs and an honorary student organization enhance learning opportunities and the quality of the undergraduate experience for students in the biological sciences. These clubs provide opportunities for undergraduate students to interact with faculty, to discuss careers and research areas with scientists from the Ohio State campus and beyond, and to participate in service activities.

Stone Laboratory

Biology students may take courses at Stone Laboratory, the university’s “Island Campus.” Located on Gibraltar Island in Put-in-Bay on Lake Erie, this freshwater biological field station and research laboratory offers introductory and upper-level courses.
Curriculum Sample
This is a sample list of classes a student will take to pursue a degree in biology with a specialization in pre-health professions. Since university students need more than specific education in a narrow field, they also will take classes to complete General Education (GE) requirements. Because GE courses come from a variety of academic areas of study, this course work helps students develop fundamental skills essential to collegiate success and allows them to tailor these courses toward their interests. Note: This sample represents one of many possible paths to a degree in biology. Consult the website of the Center for Life Sciences Education, clse.osu.edu, for further information about the Biology curriculum.

Freshman Year:
- Survey course 1
- General Biology 8
- General Chemistry 10
- Math (calculus and modeling) 10
- GE courses 3
  **Total hours** 32

Sophomore Year:
- Integrated Biology 4
- Organic Chemistry 8
- Organic Chemistry Laboratory 4
- Evolution 4
- Elective courses 3
- GE courses 8
  **Total hours** 31

Junior Year:
- General Genetics 3
- Microbiology 4
- Biochemistry 4
- Cell Biology 3
- General Physics 10
- GE courses 7
  **Total hours** 31

Senior Year:
- Comparative Anatomy 3
- Diversity and Systematics 3
- Vertebrate Histology 1.5
- Undergraduate research or major elective 4
- Elective courses 7
- GE courses 9
  **Total hours** 27.5

suitable for undergraduate students in biological sciences.

**Honors & Scholars Programs**
Ohio State offers the Honors and Scholars Programs to create an environment of intellectual support and stimulation within a close-knit community of high-ability undergraduate students. Through these programs, students have access to smaller classes, undergraduate research opportunities, close working relationships with faculty, priority scheduling and unique housing options. Learn more at [honors-scholars.osu.edu](http://honors-scholars.osu.edu).

The Honors Program in the College of Arts and Sciences provides high-ability students opportunities to construct an enhanced curriculum that includes honors courses and upper-division courses to meet general requirements, rigorous sequences, honors seminars and a significant research experience.

Scholars programs feature residential communities for talented students who share academic interests and career goals. For example, two Scholars programs of interest to biology majors are the Biological Sciences Scholars program, which emphasizes research, individualized advising, and significant lab and field experience; and the Health Sciences Scholars program, which prepares students for careers in health sciences and health care.

**Career Prospects in Biology**
Biology students often choose careers as research scientists or college professors, for which students must first obtain a PhD. In the private sector, a master’s degree may be sufficient for a research or product-development position. Some biology majors, particularly those with research experience, find research assistant positions directly after obtaining their bachelor’s degrees.

Many biology students go on to careers in medicine or some other health profession. While a major in the biological sciences is not a requirement for medical school (or other professional schools in the health sciences), it has many advantages, with its exposure to the basic principles of life’s processes and the theoretical underpinnings of sophisticated medical procedures.

While a major in the biological sciences is not a requirement for medical school (or other professional schools in the health sciences), many biology students go on to careers in medicine or some other health profession. Some students move into other science careers such as education (K-12), business (e.g., pharmaceutical sales), or jobs in nature centers, parks and recreation, or government.

Salaries are commensurate with level of education and prior job experiences. Salaries in general are dependent upon a variety of economic factors and change with market trends.

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**Revised August 2015.** Information subject to change. For the most up-to-date information on the biology program, please visit [clse.osu.edu](http://clse.osu.edu).

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