BIOLOGY

Program coordinator: Leah Hartmann (amaleah.hartman@yale.edu)

Yale offers four biological science majors: Ecology and Evolutionary Biology (E&EB); Molecular Biophysics and Biochemistry (MB&B); Molecular, Cellular, and Developmental Biology (MCDB); and Neuroscience (NSCI). The distinctions between these majors reflect the types of biological systems analysis each represents: the analysis of whole organisms, populations, and ecosystems (E&EB); the analysis of life at the molecular level using tools of chemistry and physics (MB&B); the analysis of molecular, cellular, and developmental biology, genetics, neurobiology, and quantitative biology (MCDB); and the analysis of neurons, neural circuits, brains, and behavior, using a wide range of approaches (NSCI).

Yale also offers the Biomedical Engineering (BENG) major for students interested in studying biological systems from the perspectives of the physical sciences and engineering.

Together, these approaches cover the vast breadth of disciplines in the biological sciences. The courses BIOL 101–104 are designed as entry points to all four programs. The prerequisites for the four majors are similar, so students need not commit to a specific major in their first year. Students who wish to major in any of the four tracks (E&EB, MB&B, MCDB, and NSCI) must complete all four modules.

For information on the major requirements, course offerings, and departmental faculty of the biological sciences programs, see Ecology and Evolutionary Biology; Molecular Biophysics and Biochemistry; Molecular, Cellular, and Developmental Biology; and Neuroscience. See also information for Biomechanical Engineering.

The BIOL 101–104 modules are each half-semester, half-credit courses that together make up a yearlong course known as the biology sequence. The aim of the sequence is to provide students with a foundation in the biological sciences. Prospective majors in Molecular Biology and Biophysics (MB&B), Molecular, Cellular, and Developmental Biology (MCDB), Ecology and Evolutionary Biology (E&EB), and Neuroscience (NSCI) and other students wishing to learn about the biological sciences should complete the entire BIOL 101–104 sequence. Majors in Biomedical Engineering (BENG) are only required to take BIOL 101 and 102.

The foundational biology sequence is offered jointly by the departments of Molecular Biophysics and Biochemistry; Molecular, Cellular, and Developmental Biology; and Ecology and Evolutionary Biology. The four modules that comprise the biology sequence are:

- BIOL 101, Biochemistry and Biophysics
- BIOL 102, Principles of Cell Biology
- BIOL 103, Genetics and Development
- BIOL 104, Principles of Ecology and Evolutionary Biology
All modules are offered during both the fall and spring terms. BIOL 101 and BIOL 103 are offered during the *first half* of both the fall and spring terms. BIOL 102 and BIOL 104 are offered during the *second half* of both the fall and spring terms.

Since the modules must be taken in order, students typically start by taking BIOL 101 and BIOL 102 in the fall or spring term and complete the sequence by taking BIOL 103 and BIOL 104 in the following term. To unify the modules, course coordinators travel with a single cohort of students as they progress through the foundational biology sequence. Thus, please direct all inquiries related to the foundational biology sequence course to Leah Hartmann. (amaleah.hartman@yale.edu)

Take note that each module is taught as *its own* course, so students must register for each module separately. Students receive a separate grade for each module. The modules must be taken in sequence. This means that you must successfully pass or place out of BIOL 101 to be eligible to take BIOL 102 and so forth.

Students with advanced preparation may be eligible to place out of one or more of these courses; see the Yale College Dean's Office website: Placement, Exams, and Information: Biology for details.

**MAJORS IN THE BIOLOGICAL SCIENCES AND BIOMEDICAL ENGINEERING**

Yale offers four undergraduate majors in the biological sciences and a major in Biomedical Engineering (BENG). The biological sciences majors are Ecology and Evolutionary Biology (E&EB); Molecular Biophysics and Biochemistry (MB&B); Molecular, Cellular, and Developmental Biology (MCDB); and Neuroscience (NSCI). The distinctions between these majors reflect the types of biological systems analysis each represents: the analysis of whole organisms, populations, and ecosystems (E&EB); the analysis of life at the molecular level using tools of chemistry and physics (MB&B); the analysis of molecular, cellular, and developmental biology, genetics, neurobiology, and quantitative biology (MCDB); and the analysis of neurons, neural circuits, brains, and behavior, using a wide range of approaches (NSCI). Together, these approaches cover the vast breadth of disciplines in the biological sciences.

The foundational course work applicable to the four majors is similar, so students need not commit to a specific major during their first year. Most prospective majors begin study as first-year students in at least two subjects from among the basic science prerequisites of chemistry, biology, and mathematics. The specific combination and sequence of courses that best serve a given student's needs depend on factors such as advanced placement and the student's other academic and extracurricular commitments. It is therefore critically important for students to seek individualized advice from one of the directors of undergraduate studies (DUSes) or other departmental representatives before selecting first-year science courses.

The Biomedical Engineering major is available for students interested in studying biological systems from the perspectives of the physical sciences and engineering. As in the other biological sciences majors, students need not commit in their first year, but should in most cases begin their preparation by taking courses in mathematics and in at least one of the basic sciences of biology, chemistry, or physics. The appropriate level
and combination of courses depends on each student’s preparation and interests, and students are urged to seek individualized advice before selecting fall-term courses.

See each program’s individual entry for more information.

View Courses