

Biology

Course 7

Biology is one of the most important disciplines today, with research at the frontiers of biotechnology, medicine, and engineering. A degree in biology is an excellent entry point into many professions. The biology undergraduate program offers a wide range of courses, an emphasis on lab research, and two degree options.

Biology is a field devoted not just to the study of life, but to its improvement as well. In this century, we have seen devastating diseases such as smallpox and polio almost completely eradicated by the development and widespread use of vaccines. Within the past 20 years, biologists have made advances once thought impossible that have helped unfold mysteries about the functions of the brain and nervous system, genetic mutations, the structure of DNA, the causes of cancers, and the treatment of infertility.

Biology at MIT

The Department of Biology at MIT has played a major role in the rapid advancement of our understanding of the life sciences. The department has an outstanding reputation in the various disciplines of modern molecular biology. The faculty is an impressive collection of scientists that includes four Nobel laureates and 36 members of the National Academy of Sciences. The department maintains its top position because of the faculty's dedication to the education of students and because of the continual updating of the curriculum to keep pace with the rapid advances in biological research.

Undergraduate Program

The department's undergraduate degree programs are designed to provide students with a broad education in the basic biological sciences. Students majoring in biology at MIT must complete the General Institute Requirements in science, humanities, arts, and social sciences. For their major,

they must complete courses in chemistry, biology, genetics, chemical thermodynamics, biochemistry, and cellular biology. The department offers two degree programs: Course 7 and Course 7A. The curricula for the two programs are alike, but Course 7A is designed for those students who want to do extensive coursework outside the department or who wish to pursue careers that do not involve extensive laboratory work (e.g., psychology, medicine without laboratory research, and management). Therefore, Course 7A does not require the advanced research laboratory required for Course 7.

Research

As undergraduate biology majors at MIT, students have the opportunity to conduct research with faculty through the Undergraduate Research Opportunities Program (UROP). UROP positions allow students to earn either pay or credit while participating in faculty research. Many students have found UROP projects to be among their most valued educational experiences at MIT. Students in these research positions do not perform routine tasks for which technicians would be hired. Instead, the department believes that undergraduates should gain experience that allows them to design their own experiments as graduate and postgraduate researchers. The list of UROP projects is varied, but students also have the option to initiate their own research projects through the department.

Research programs in the department include biochemistry, biophysics, bioengineering, cancer, genetics, developmental biology, cell biology, the human genome, immunology, microbiology, neurobiology, plant molecular genetics, protein engineering, computational and systems biology, protein structure and drug design, stem cells, cloning, and virology.

These studies use theoretical and computational approaches as well as experimental model systems including human, mouse, frog, fish, fruit fly, worm, plant, yeast, bacteria, and in vitro cell culture.

Biology undergraduates benefit from these broad research areas through an extensive course curriculum that leads to a sophisticated understanding of fundamental principles and current approaches to biology. Emphasis is placed on molecular and cell biology. All Course 7 majors participate in laboratory research, with focus on experimental design, data evaluation and scientific presentation. Many research opportunities are provided.

Biology research at MIT is done in the more than 60 labs and centers used by the department. Some of these labs are operated in conjunction with other departments and programs. Among the facilities available to biology students at MIT are research groups located in the Koch Biology Building, the Koch Institute for Integrative Cancer Research, the Whitehead Institute for Biomedical Research, the Picower Institute for Learning and Memory, the McGovern Institute for Brain Research, and the Broad Institute.

Post-Baccalaureate Opportunities

The SB programs in the Department of Biology at MIT prepare students exceptionally well for further study. This training provides excellent preparation for careers in biomedicine and many other professions, and particularly for research in academia or industry, medicine, management or finance in the pharmaceutical and biotech industries, intellectual property law, high school- or college-level teaching, forensics, and bioethics. In fact, junior and senior biology majors at MIT often take coursework that is comparable to graduate-level work at some of the best universities. About 95 percent of the department's students go on to graduate or medical school, although opportunities are also available in private industry.

An undergraduate education in biology is excellent preparation for medical school. Although there is no specific premedical curriculum at the undergraduate level, biology students find it less difficult to meet the requirements for admission to medical schools

than do students in most other academic departments. Overall, MIT applicants have one of the highest acceptance rates to medical schools in the country. Students interested in medical careers should contact the MIT Careers Office for further information.

Contact Information

For more information, please contact:
The Biology Education Office, MIT
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Information is also available on the web at <http://biology.mit.edu>.

The MIT Course Catalog contains further information on the Institute, including all graduate and undergraduate courses and programs. Please visit the MIT Course Catalog website for more details at <http://web.mit.edu/catalog/index.html>.

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