

Biology

is one of the most exciting current disciplines, with research at the frontiers of biotechnology and medicine, and is an excellent entry point into many professions. The Department of Biology offers a wide range of teaching and research activities and houses more than 60 research groups located in the Koch Biology Building, the Center for Cancer Research, the Whitehead Institute for Biomedical Research, the Picower Center for Learning and Memory, the McGovern Institute for Brain Research and the Broad Institute. The present Biology Department faculty includes four Nobel laureates and 26 members of the prestigious National Academy of Sciences.

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
- Virology

These studies use both 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.

These broad research interests benefit Biology Department undergraduates through an extensive course curriculum that provides rigorous training in both fundamental and current approaches to Biology. Particular emphasis is given to Molecular and Cell Biology. Further, many research opportunities are provided in Biology Department laboratories. All Course VII majors participate in laboratory research, with associated training in experimental design, data evaluation and scientific presentation.

This training provides excellent preparation for careers in the biomedical and many other professions, since issues in Biology are so pervasive today. Some of the next career steps our Biology graduates have recently taken include: medical school, graduate studies in Biology or related fields, high school or college level teaching, research or management in the pharmaceutical and biotech industries, intellectual property law and bioethics.

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BIOLOGY

Undergraduate Study

2005-2006

Program Requirements



Biology Undergraduate Course Offerings 2005–2006

Required Lecture Courses:

7.012	Fall	Introductory Biology
7.013	Spring	Introductory Biology
7.014	Spring	Introductory Biology
7.03	Fall	Genetics
7.05	Spring	General Biochemistry
7.06	Spring	Cell Biology

Laboratory Courses:

7.02	Fall/Spring	Introduction to Experimental Biology and Communication
7.13	Fall	Experimental Microbial Genetics
7.16	Spring	Experimental Molecular Biology: Biotechnology II
7.17	Spring	Experimental Molecular Biology: Biotechnology III
7.18	Fall/Spring	Topics in Experimental Biology

Biology Restricted Electives:

7.08J	Spring	Biological Chemistry II
7.20J	Fall	Human Physiology
7.21	Fall	Microbial Physiology
7.22	Fall	Developmental Biology
7.23	Spring	General Immunology
7.24	Fall	The Protein Folding Problem
7.25	Spring	Biological Regulatory Mechanisms
7.27	Spring	Principles of Human Disease
7.28	Spring	Molecular Biology
7.29J	Spring	Cellular Neurobiology
7.30J	Fall	Fundamentals of Ecology
7.31	Fall	Current Topics in Mammalian Biology: Medical Implications
7.35	Fall	Topics in Metabolic Biochemistry
7.36	Spring	Foundations of Computational and Systems Biology
7.37J	Spring	Molecular and Engineering Aspects of Biotechnology

Additional Biology Courses:

7.19	Fall/Spring	Communication in Experimental Biology
7.34X	Fall/Spring	Advanced Undergraduate Seminars
7.38J	Spring	Introduction to Bioengineering
7.40J	Spring	Biotechnology: Engineering of Macromolecules

Undergraduate Research in Biology

Laboratory research is a vital component of the MIT Biology education. Students are encouraged to participate in cutting edge research projects. The Biology UROP Experience (BUE) Program promotes success in UROP projects, by providing a forum for discussions and enhancing interaction between mentors and students. Information on research carried out in the Department can be found at <http://mit.edu/biol-ogy/www/facultyareas/>.

Cambridge-MIT Exchange Program

The Biology Department participates in the CME Junior year study abroad program at the University of Cambridge. Eligible students must have permission from the Biology Department in advance of their year at Cambridge in order to receive credit. Biology Department guidelines are on the website at: <http://mit.edu/biology/www/undergrad/CMEexchange.html>.

Biology Department Advising Policy

All Biology students are assigned a faculty advisor and meet at least twice a semester, once on Registration Day and again during mid-term. These meetings allow discussion of a student's academic progress and any other issues. Students are encouraged to set up additional meetings. Students are able to change advisors, and are invited to provide feedback to the Department through meetings with the Undergraduate Officers.

Biology Undergraduate Student Association (BUSA)

The Biology Undergraduate Student Association (BUSA) is open to all Biology majors and students who are interested in Biology. BUSA organizes student events, the Departmental Tutoring Program and the Big Sib/Li'l Sib Program where students in different years help each other. For more information visit the website at: <http://mit.edu/busa/>.

The Biology Curriculum

leading to a Bachelor of Science degree in Biology (Course VII or VII-A) or to a Minor in Biology includes the General Institute Requirements, as well as the specific subjects listed. The degree program allows students to take graduate level courses in Biology, to explore relevant classes in other departments and to perform significant research through the Undergraduate Research Opportunities Program (UROP).

SB in Biology/Course VII Program

Required lecture subjects:

7.012 or 7.013 or 7.014	Introductory Biology
7.03	Genetics
7.05 or 5.07	General Biochemistry
7.06	Cell Biology
5.111 or 5.112 or 309.1	Introductory Chemistry
5.12	Organic Chemistry
5.60 or BE110J	Thermodynamics

(2.005, 8.044, 10.213, or 16.01/16.02 will also substitute for 5.60)

Required restricted electives:

Three restricted electives from the following courses are required: 7.08J, 7.20J, 7.21, 7.22, 7.23, 7.24, 7.25, 7.27, 7.28, 7.29J, 7.30J, 7.31, 7.35, 7.36, 7.37J. (See *Course Offerings* for course titles corresponding to these numbers).

Required laboratory subjects:

7.02	Introduction to Experimental Biology and Communication, and one of the following Project Labs:
7.13	Experimental Microbial Genetics
7.16	Experimental Molecular Biology: Biotechnology II
7.17	Experimental Molecular Biology: Biotechnology III
7.18	Topics in Experimental Biology

SB in Biology/Course VII-A Program

The VII-A program provides flexibility for students wishing to include extensive course work from other Departments. The VII-A curriculum is identical to the Course VII curriculum except that it does not require Project Laboratory and the corresponding credit can be taken from any Institute subjects.

Minor in Biology Requirements

5.12 Organic Chemistry
7.03 Genetics
7.05 Biochemistry
and two additional subjects from the following: 7.02, 7.06, 7.08J, 7.20J, 7.21, 7.22, 7.23, 7.24, 7.25, 7.27, 7.28, 7.29J, 7.31, 7.35, 7.36, 7.37J (See *Course Offerings* for course titles corresponding to these numbers).

CI-M Requirement (Communication Intensive in the Major)

All Biology majors must complete two CI-M courses, generally by their Junior or Senior year. CI-Ms teach the specific forms of written, oral, and/or visual communication appropriate to Biology's professional and academic culture.

CI-M subjects for the Course VII degree are: 7.02 and one of: 7.13, 7.16, 7.17, or 7.18.

CI-M subjects for Course VII-A are: 7.02 and one of: 5.32, 5.33, 6.021J/2.791J/BE.370J, 7.19, 8.13, 9.01, 9.02, 9.63, 10.26, 10.27, or 10.28.

More information about the CI-M requirement is available at <http://mit.edu/commreq/>.