

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. In addition, the Biology Department offers a series of recommended tracks that allow a student to gain depth and breadth in a particular area.

The Department of Biology houses more than 60 research groups located in the Koch Biology Building, the David H. 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. The present Biology Department faculty includes three Nobel laureates and 30 members of the prestigious National Academy of Sciences.

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 Department undergraduates benefit from these broad research areas through an extensive course curriculum that leads to sophisticated understanding of fundamental principles

and current approaches to Biology. Emphasis is given to Molecular and Cell Biology. All Course 7majors participate in laboratory research, with focus on experimental design, data evaluation and scientific presentation. Many research opportunities are provided.

This training provides excellent preparation for careers in the biomedical and many other professions, particularly 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.

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

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MIT DEPARTMENT OF BIOLOGY

Undergraduate Program Requirements

2013-2014

Biology Undergraduate Course Offerings 2013–2014

Lecture Courses:

7.012	Fall	Introductory Biology
7.013	Spring	Introductory Biology
7.014	Spring	Introductory Biology
7.015	Fall	Introductory Biology
7.016	Fall	Introductory Biology
7.03	Fall/Spring	Genetics
7.05	Spring	General Biochemistry
7.06	Fall/Spring	Cell Biology
7.10J	Spring	Physical Chemistry of Biomolecular Systems

Laboratory Courses:

7.02J	Fall/Spring	Introduction to Experimental Biology and Communication
7.15	Spring	Molecular Genetics
7.16	Spring	Experimental Molecular Biology: Biotechnology II
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	Development and Evolution
7.23	Spring	Immunology
7.26	Spring	Molecular Basis of Infectious Disease
7.27	Spring	Principles of Human Disease
7.28	Spring	Molecular Biology
7.29J*	Spring	Cellular Neurobiology
7.30J	Fall	Ecology I: The Earth System
7.31	Fall	Current Topics in Mammalian Biology: Medical Implications
7.32J	Fall	Systems Biology
7.33J	Spring	Evolutionary Biology
7.36	Spring	Foundations of Computational and Systems Biology
7.37J	Spring	Molecular and Engineering Aspects of Biotechnology
7.38	Spring	Forces in Cell Biology and Development
7.49J	Spring	Developmental Neurobiology

Additional Biology Courses:

7.19	Fall/Spring	Communication in Experimental Biology
7.34X	Fall/Spring	Advanced Undergraduate Seminars

*Not offered 2013–2014

The Biology Curriculum leading to a Bachelor of Science degree in Biology (7, 7A and Computer Science and Molecular Biology, 6-7) or to a minor in Biology includes the General Institute Requirements, as well as the specific subjects listed.

SB in Biology/Course 7

Required lecture subjects:

7.012 or 7.013 or 7.014	
7.015 or 7.016	Introductory Biology
7.03	Genetics
7.05 or 5.07J	General Biochemistry
7.06	Cell Biology
5.111 or 5.112 or 3.091	Introductory Chemistry
5.12	Organic Chemistry
7.10J or 20.110J or 5.60	Thermodynamics
(2.005, 3.012, 8.044, or 10.213 will also substitute)	

Required restricted electives:

Three restricted electives from the following courses are required: 7.08J, 7.20J, 7.21, 7.22, 7.23, 7.26, 7.27, 7.28, 7.29J, 7.30J, 7.31, 7.32J, 7.33J, 7.36, 7.37J, 7.38, 7.49.

Required laboratory subjects:

7.02J	Introduction to Experimental Biology and Communication (10.702J or 20.109 will substitute) <i>and one of the following Project Labs:</i>
7.15	Molecular Genetics
7.16	Experimental Molecular Biology: Biotechnology II
7.18	Topics in Experimental Biology

SB in Biology/Course 7A

The 7A program provides flexibility for students wishing to include extensive course work from other Departments. The 7A curriculum is identical to the Course 7 curriculum except that it does not require Project Laboratory and the corresponding credit can be taken from any Institute subjects.

Undergraduate Research in Biology

Undergraduates have a large variety of research opportunities available through the Project Laboratories and Undergraduate Research Opportunities Program (UROP). Students who demonstrate outstanding research effort may also be nominated by faculty to participate in the annual Undergraduate Research Symposium.

Cambridge-MIT Exchange Program

The Biology Department participates in the CME Junior year study abroad program at the University of Cambridge. Department guidelines are on the website at: gecd.mit.edu/go_abroad/study/explore/cme.

SB in Computer Science and Molecular Bio/Course 6-7

The Course 6-7 program offered by the Departments of Biology and Electrical Engineering and Computer Science focuses on the emerging field of computational and molecular biology.

Required lecture subjects:

Same as Course 7 PLUS the following:

6.01, 6.042, 18.03 or 18.06	Differential Equations
6.005, 6.006, 6.046	Software & Algorithms

Required restricted electives (one from each):

Biology: 7.20J, 7.23, 7.27, 7.28 OR 7.33J

Computer Science: 6.047, 6.58J, 6.874, 6.877J, OR 7.36

Required laboratory subject: 7.02J

Undergraduate Advanced Project: 6.UAT and 6.UAP

Minor in Biology

5.12	Organic Chemistry
7.03	Genetics
7.05	Biochemistry

and two additional subjects from the following: 7.02J/10.702J or 20.109; 7.06, 7.08J, 7.20J, 7.21, 7.22, 7.23, 7.26, 7.27, 7.28, 7.29J, 7.31, 7.32J, 7.33J, 7.36, 7.37J, 7.38 7.49.

CI-M Requirement (Communication Intensive in the Major)

All Biology majors must complete two CI-M courses.

CI-M subjects for the Course 7 degree are: 7.02J/10.702J or 20.109 and one of: 7.15, 7.16, or 7.18.

CI-M subjects for Course 7A are: 7.02J/10.702J or 20.109 and one of: 3.014, 5.36, 5.38, 7.19, 1.018J/7.30, ~~7.41~~ 8.13, 9.02, 9.12, 7.49/9.18, 10.26, 10.27, 10.28, 10.29, 20.380 or 2.791J/6.021J/20.370J.

CI-M subjects for Course 6-7 are: 7.02J and 6.UAP

Note: 7.30 can be used as either an RE or CI-M, but not as both.

Advising in the Biology Department

Each Biology student meets with his/her faculty advisor at least twice per semester, once on Registration Day and again at mid-term. These meetings allow discussion of academic progress and provide excellent mentoring opportunities. Students are encouraged to set up additional meetings. Students are able to change advisors, and are invited to provide feedback to the Department.

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 and informal luncheons and dinner lectures between Biology faculty members and undergraduates. For more information visit the website at: mit.edu/busa.