

MIT DEPARTMENT OF
BIOLOGY

BioTracks

Tracks in the Biology Program

2011–2012



BioTracks

Tracks in the Biology Major

Biology students have the option of pursuing a specific "Track" within the Biology major. In some cases, these Tracks recommend a set of non-Biology courses that provide breadth and depth in the indicated topic. In other cases, the Tracks provide guidance in how to focus on a specific sub-discipline of Biology. A student can switch between Tracks, or devise his/her own degree program. **In addition to recommended Depth/Breadth courses, each Track requires all courses necessary to fulfill the Biology major requirements (7/7A).** Some recommended courses (Biology Restricted Electives, Thermodynamics, Project Lab) also fulfill Biology degree requirements. Students will work with their advisor to determine their Tracks and submit this information to the Education Office by the end of the term in which they graduate. The Biology Department provides official acknowledgement that a student has completed a specific Track.

General Biology

This includes choice of courses at student's discretion. All students are encouraged to take courses in Statistics (18.05, 6.041 or 9.07) and Programming (1.00 or 6.00).

Biochemistry

Depth/Breadth Courses

- Laboratory Chemistry (5.310)
- Organic Chemistry II (5.13)
- Advanced Organic Chemistry (5.43)
- Statistics (one of 18.05, 6.041 or 9.07)

Biology Restricted Electives

- 7.08J, 7.28, 7.35

Bioengineering*

Depth/Breadth Courses

- Differential Equations (18.03)
- Engineering Core (2.003J, 3.022 or other)
- BME Elective (20.110J) (fulfills Thermo. requirement)
- Programming (1.00 or 6.00)

Biology Restricted Electives

- 7.36, 7.37J, plus one additional Bio RE

*Fulfills requirement for BME minor.

Biophysics

Depth/Breadth Courses

- Differential Equations (18.03)
- Physics III (8.03)
- Quantum Physics I (.8.04)
- Statistical Physics I (8.044) (fulfills Thermo. requirement)

Biology Restricted Electives

- Three additional Bio REs

Cell, Developmental, and Molecular Biology

Depth/Breadth Courses

- Statistics (one of 18.05, 6.041 or 9.07)
- Programming (1.00 or 6.00)

Biology Restricted Electives

- Three of 7.22, 7.23, 7.28, 7.31

Computational Biology

Depth/Breadth Courses

- Programming (1.00 or 6.00)
- Additional Math. (18.03 and 18.06)
- Statistics (one of 18.05, 6.041 or 9.07)

Biology Restricted Electives

- Three Bio REs to include 7.36 and/or 7.33J

Human Biology

Depth/Breadth Courses

- Statistics (one of 18.05, 6.041 or 9.07)
- Society and Health (21A.215 or STS.005)
- Bioethics (21A.216J or STS.006J)

Biology Restricted Electives

- Three of 7.20J, 7.22, 7.23, 7.27, 7.31

Microbiology

Depth/Breadth Courses

- Laboratory Chemistry (5.310)
- Systems Microbiology (1.084J)
- Environmental Microbiology (1.89)
- Experimental Microbiology (7.13) (Fulfills Project Lab requirement)
- Statistics (one of 18.05, 6.041 or 9.07)

Biology Restricted Electives

- Three of 7.08J, 7.21, 7.25, 7.30J

Neurobiology

Depth/Breadth Courses

- Neuroscience (9.01, 9.29J or 9.18)
- Statistics (9.07, 18.05 or 6.041)
- Experimental Neurobiology (9.02 or 9.12)

Biology Restricted Electives

- 7.29J, plus two additional Bio REs

Biology Degree Requirements

All BioTracks must include completion of the following:

Required Lecture Subjects:

- ☐ 7.012 or 7.013 or 7.014 Introductory Biology
- ☐ 7.03 Genetics
- ☐ 7.05 or 5.07J Biochemistry
- ☐ 7.06 Cell Biology
- ☐ 5.111 or 5.112 or 3.091 Chemistry
- ☐ 5.12 Organic Chemistry
- ☐ 7.10J or 20.110J or 5.60 (2.005, 3.012, 8.044 or 10.213) Thermodynamics
- ☐ Three restricted electives from the following courses are required[†]: 7.08J, 7.20J, 7.21, 7.22, 7.23, 7.25, 7.26, 7.27, 7.28, 7.29J, 7.30J, 7.31, 7.32, 7.33J, 7.35, 7.36, 7.37J.

Required Laboratory Courses:

- ☐ 7.02J (10.702J or 20.109 will substitute) Intro to Experimental Biology
- ☐ Project lab (7.13, 7.16, or 7.18)
No project lab required for Course 7A

Communication Requirements:

- ☐ Two CI-M subjects in the Major
 - ☐ **For Course 7:** 7.02J/10.702J or 20.109 and one of: 7.13, 7.16, or 7.18
 - ☐ **For Course 7A:** 7.02J/10.702J or 20.109 and one of 3.014, 5.36, 5.38, 7.19, 8.13, 9.02, 9.12, 9.18, 9.63, 10.26, 10.28, 10.29, 20.380 or 2.791J/6.021J/20.370J.

[†] List of Restricted Electives:

- 7.08J Biological Chemistry II
- 7.20J Human Physiology
- 7.21 Microbial Physiology
- 7.22 Development and Evolution
- 7.23 General Immunology
- 7.25* Biological Regulatory Mechanisms
- 7.26 Molecular Basis of Infectious Disease
- 7.27 Principles of Human Disease
- 7.28 Molecular Biology
- 7.29J Cellular Neurobiology
- 7.30J Ecology I: The Earth System
- 7.31* Current Topics in Mammalian Biology: Medical Implications
- 7.32 Systems Biology
- 7.33J Evolutionary Biology
- 7.35 Topics in Metabolic Biochemistry
- 7.36* Foundations of Computational and Systems Biology
- 7.37J Molecular and Engineering Aspects of Biotechnology

*not offered 2011–2012

Contact Information

Biology Education Office, Room 68-120

Phone: 617-253-4718

Email: biotracks@mit.edu

Biology website: <http://mit.edu/biology>