



BioTRACKS

Tracks in the Biology Major

2009–2010



BioTracks

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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 (VII/VIIA).** 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 (2.003, 3.022 or other)
- BME Elective (20.110) (fulfills Thermo. requirement)
- Programming (1.00 or 6.00)

Biology Restricted Electives

- 7.36, 7.37, plus one add'l Bio RE

*Fulfills requirement for BME minor.

Biophysics

Depth/Breadth Courses

- Differential Equations (18.03)
- Vibrations and Waves (8.03)
- Quantum Mechanics (8.04)
- Statistical Physics (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

- 7.36, plus two additional Bio REs

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.216 or STS.006)

Biology Restricted Electives

- Three of 7.20, 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, 9.29 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
- ☐ 20.110J or 20.111 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, 7.24, 7.25, 7.26, 7.27, 7.28, 7.29J, 7.30J, 7.31, 7.35, 7.36, 7.37J.

Required Laboratory Courses:

- ☐ 7.02 (10.702 or 20.109 will substitute) Intro to Experimental Biology
- ☐ Project lab (7.13, 7.16, 7.17, or 7.18)
No project lab required for Course VII-A

Communication Requirements:

- ☐ Two CI-M subjects in the Major
 - ☐ For Course VII: 7.02/10.702 or 20.109 and one of: 7.13, 7.17, or 7.18
 - ☐ For Course VII-A: 7.02/10.702 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, 10.27, 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
- 7.24* The Protein Folding Problem
- 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
- 7.35 Topics in Metabolic Biochemistry
- 7.36 Foundations of Computational and Systems Biology
- 7.37J Molecular and Engineering Aspects of Biotechnology

*not offered 2009–2010

Contact Information

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