

The Department of Biology

2017-2018



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MULTIPLE BIOLOGY MAJOR

These major requirements automatically apply to any student who is currently in their first year or second at Barnard - that is, the class of 2019 or 2020. The class of 2018 may follow the old major requirements.

There are four possible ways to complete a major within Biology. A student can obtain a general Biology Major or may complete one of the three majors that concentrate on a specific level of Biological organization: Cell and Molecular Biology, Physiology and Organismal Biology, or Ecology and Evolutionary Biology.

Introductory Biology and Genetics

All students complete the 1500-level introductory sequence followed by a course in Genetics:

- BIOL BC1500x Introduction to Organismal and Evolutionary Biology
- BIOL BC1501x Introductory Lab in Organismal and Evolutionary Biology
- BIOL BC1502y Introduction to Cell and Molecular Biology
- BIOL BC1503y Introductory Lab in Cell and Molecular Biology
- BIOL BC 2100 Molecular and Mendelian Genetics

It is recommended, but not required, that Genetics be taken immediately after completing the 1500-level introductory sequence.

Upper-level Courses

Students must complete five courses from the three categories below. To complete one of the three concentrations, at least 4 courses must be from the appropriate category and at least 1 from another category. To complete the Biology Major without a concentration, the five courses must include at least one course from each of the three categories. Although some courses are listed in multiple categories, a student can only use a course towards one of the categories. Additional Columbia courses that can be used to fulfill the major requirements are provided on the biology website. If a student completes courses which make her eligible for more than one of the four majors then she may select which one is reflected on her transcript.

Courses in the Biology Major (see the last page of this packet for courses offered in Spring 2017)

Cell & Molecular Biology:

BIOL BC2278 Evolution
 BIOL BC3308 Genomics and Bioinformatics
 BIOL BC3310 Cell Biology
 BIOL BC3320 Microbiology
 BIOL BC3352 Development
 BIOL BC3362 Molecular and Cellular Neuroscience
 CHEM BC3282 Biochemistry I
 BIOL W3034 Biotechnology
 BIOL W3073 Cellular and Molecular Immunology
 BIOL W3310 Virology

Physiology & Organismal Biology

BIOL BC2262 Vertebrate Biology
 BIOL BC2280 Animal Behavior
 BIOL BC2286 Statistics and Research Design
 BIOL BC3320 Microbiology
 BIOL BC3360 Physiology
 BIOL BC3367 Ecophysiology
 EEEB W3011 Behavioral Biology of Living Primates
 EEEB W3208 Explorations in Primate Anatomy
 EEEB W4112 Ichthyology
 BIOL W3005 Neurobiology: Development & Systems

Ecology & Evolutionary Biology

BIOL BC2240 Plant Evolution and Diversity
 BIOL BC2262 Vertebrate Biology
 BIOL BC2272 Ecology
 BIOL BC2278 Evolution
 BIOL BC2286 Statistics and Research Design
 BIOL BC3280 Applied Ecology and Evolution
 BIOL BC3367 Ecophysiology
 BIOL BC3388 Tropical Ecology
 EEEB W3087 Conservation Biology
 EEEB W4110 Coastal Estuarine Ecology

The four majors are summarized in the following Table:

Major	Course Selection
Biology	Five courses with at least one course from each of the three categories.
Cell & Molecular Biology	Four courses from the Cell & Molecular Biology category, one from another category.
Physiology & Organismal Biology	Four courses from the Physiology & Organismal Biology category, one from another category.
Ecology & Evolutionary Biology	Four courses from the Ecology & Evolutionary Biology category, one from another category.

Three upper-level laboratory courses

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Students may take any upper-level Biology lab courses for which they meet the pre- or co-requisite. A year-long research-seminar course may substitute for lab courses, as described below. Students may also take laboratory courses at Columbia (or other institutions) to satisfy the lab requirement, with permission from the department chair.

Guided Research and Seminar

Enrollment in the year-long sequence of Guided Research and Seminar (BIOL BC3591x, 3592y) fulfills two upper-level labs. This course is only available as a Fall-Spring sequence.

Senior Capstone Experience

Students complete the Senior Capstone Experience with either of the following two options:

1. One semester of Senior Seminar BIOL BC3595
2. The year-long Senior Thesis Research and Seminar (BIOL BC3592x, 3593y)

Chemistry Requirement

All majors, regardless of their track, must complete at least one semester of General Chemistry (with laboratory) and at least one semester of Organic Chemistry (with laboratory).

THE BIOLOGY MINOR

A minor in biology includes:

1. One year of introductory biology (BIOL BC1500, BC1501, BC1502, BC1503).
2. Three biology lecture courses at the 2100 level or higher.
3. Two biology laboratory courses. One of the lab courses may be replaced by two semesters of Guided Research and Seminar (BIOL BC3591x followed by BIOL BC3592y).

Please note: Chemistry, environmental science, physics, and psychology majors need to take only one advanced laboratory instead of two, but the lab may NOT be a guided research course.

ADVISING POLICIES

In the biology department, students select their advisors rather than having them assigned. The student's choice must be approved and her major declaration form signed by the Associate Chair. Any biology faculty member can serve as an advisor. There are also two interdepartment majors (below).

RELATED DEPARTMENTS AND MAJORS

Environmental Biology

(Potential advisors in Biology are Callahan, Hertz, or McGuire)

This major is run jointly by faculty in the Departments of Biology and Environmental Science. It examines the interactions between living and non-living components of the environment, and how human activities alter these interactions. <http://envsci.barnard.edu/majors/environmental-biology>

Neuroscience and Behavior

(Potential advisors in Biology are Bauer, Glendinning, or Hertz)

This major is run jointly by faculty in the Departments of Biology and Psychology. It provides a strong background in the biological underpinnings of behavior and cognition. <http://neuroscience.barnard.edu/>

RESEARCH OPPORTUNITIES

We strongly encourage students to get involved in research during the summer, academic year, or both. For many students, research is one of the most intellectually rewarding experiences at Barnard. It is also possible to receive credit for working in a laboratory at Barnard or anywhere else in New York City. You can become involved in biology research during any (or all) of your semesters at Barnard.

Three courses provide credit for research during the academic year. Before signing up for any of these courses, you should examine the associated [Checklists for Enrollment](#) located on the Biology website:

1. **Guided Research (BIOL BC3597):** This is a variable-credit one-semester course, which can be taken during any Fall or Spring semester.
2. **Guided Research & Seminar (BIOL BC3591-2):** This is a year-long course that begins in the fall. It can serve in lieu of 2 laboratory requirements* for the Biology major.

*One caveat is that the 2 lab credits for Guided Research and Seminar cannot be applied retroactively. It can be applied to students currently enrolled in the course - and in future years - but not to students who took it previous to the 2015-16 academic year.

3. **Senior Thesis Research (BIOL BC3593-4):** This is a year-long course, beginning in the fall the senior year. It can serve of the Senior requirement or in lieu of 2 laboratory requirements for the Biology major (but not both).

Please Note: You cannot get credit for doing research during the summer

COURSES OFFERED FALL 2017

BIOL BC1001	Revolutionary Concepts in Biology	Diana Heller	TTH 10:10am-11:25 am
BIOL BC2100	Molecular and Mendelian Genetics	Brian Morton	TTH 10:10am-11:25am
BIOL BC2286	Statistics and Research Design	John Glendinning	TTH 11:40am-12:55pm.
BIOL BC3310	Cell Biology	Jonathan Snow	MW 8:40am-9:55am
BIOL BC3362	Molecular and Cellular Neuroscience	Elizabeth Bauer	W11:40pm-12:55pm
BIOL BC2801	Laboratory in Genetics	Brian Morton	W 1:10pm – 6:00 pm
BIOL BC2873	Laboratory in Ecology	Paul Hertz	W1:10pm-6:00pm
BIOL BC3311	Laboratory in Cell Biology	Jonathan Snow	TH 1:10pm-6:00pm
BIOL BC3321	Laboratory in Microbiology	Krista McGuire	T1:10pm-6:00pm & W1:10pm-3:10pm
BIOL BC3590	Senior Seminar	TBD	M 3:10pm-5:00pm
BIOL BC3591*	Guided Research and Seminar	Krista McGuire	M 1:10pm-3:00pm
BIOL BC3593*	Senior Thesis Seminar	Krista McGuire	M 1:10pm-3:00pm
BIOL BC3597	Guided Research	All Faculty	

*Full Year Course