REQUIREMENTS FOR BIOLOGY MAJORS

These requirements apply to any student in the class of 2019 or later. The class of 2018 may choose to follow the old or the new major requirements. Please see the department webpage for a description of 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 Organismic and Evolutionary Biology
- BIOL BC1501x Introductory Lab in Organismic 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 2018)

**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 BC2280  Animal Behavior
- BIOL BC2286  Statistics and Research Design
- BIOL BC2851  Plants & Profits: The Global Power of Botany
- 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:

<table>
<thead>
<tr>
<th>Major</th>
<th>Course Selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology</td>
<td>Five courses with at least one course from each of the three categories.</td>
</tr>
<tr>
<td>Cell &amp; Molecular Biology</td>
<td>Four courses from the Cell &amp; Molecular Biology category, one from another category.</td>
</tr>
<tr>
<td>Physiology &amp; Organismal Biology</td>
<td>Four courses from the Physiology &amp; Organismal Biology category, one from another category.</td>
</tr>
<tr>
<td>Ecology &amp; Evolutionary Biology</td>
<td>Four courses from the Ecology &amp; Evolutionary Biology category, one from another category.</td>
</tr>
</tbody>
</table>
REQUIREMENTS FOR BIOLOGY MAJORS CONTINUED

Three upper-level laboratory courses
Students may take any upper-level Biology lab courses for which they have 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 Associate 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).

REQUIREMENTS FOR THE BIOLOGY MINOR

A minor in biology includes:

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 POLICY

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 and Hertz)
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 and 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.

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.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL BC1002</td>
<td>Global Health and Ecology</td>
<td>Diana Heller</td>
<td>TTH 10:10am-11:25am</td>
</tr>
<tr>
<td>BIOL BC1012</td>
<td>Contemporary Issues in Biology Lab</td>
<td>Diana Heller</td>
<td>Various</td>
</tr>
<tr>
<td>BIOL BC1502</td>
<td>Introduction to Cell &amp; Molecular Biology</td>
<td>Jonathan Snow</td>
<td>MWF 9:00am-9:50am</td>
</tr>
<tr>
<td>BIOL BC1503</td>
<td>Introductory Lab in Cell &amp; Molecular Biology</td>
<td>Jessica Goldstein</td>
<td>Various</td>
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<tr>
<td>BIOL BC1513</td>
<td>Recitation</td>
<td>Jessica Goldstein</td>
<td>M 10:00am-10:50am &amp; F 1:00pm-2:00pm</td>
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<tr>
<td>BIOL BC2100</td>
<td>Molecular and Mendelian Genetics</td>
<td>Jennifer Mansfield</td>
<td>TTH 10:10am-11:25am</td>
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<tr>
<td>BIOL BC2280</td>
<td>Animal Behavior</td>
<td>Alison Pischedda</td>
<td>TTH 11:40am-12:55pm</td>
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<tr>
<td>BIOL BC3360</td>
<td>Physiology</td>
<td>John Glendinning</td>
<td>TTH 10:10am-11:25am</td>
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<td>BIOL BC3321</td>
<td>Microbiology</td>
<td>Stephen Sturley</td>
<td>TTH 11:40am-12:55pm</td>
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<td>BIOL BC2851</td>
<td>Plants &amp; Profits: The Global Power of Botany</td>
<td>Hilary Callahan</td>
<td>T 10:10am-11:25 am &amp; TH 10:10 am-12:55pm</td>
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<tr>
<td>BIOL BC3361</td>
<td>Laboratory In Physiology</td>
<td>John Glendinning</td>
<td>TH 1:10pm-6:00pm</td>
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<tr>
<td>BIOL BC3363</td>
<td>Laboratory in Molecular &amp; Cell Neuroscience</td>
<td>Elizabeth Bauer</td>
<td>W 1:10pm-6:00pm</td>
</tr>
<tr>
<td>BIOL BC2574</td>
<td>Laboratory in Human Anatomy</td>
<td>Chisa Hidaka</td>
<td>M 12:10pm-4:00 pm</td>
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<tr>
<td>BIOL BC3303</td>
<td>Laboratory in Molecular Biology</td>
<td>TBD</td>
<td>TH 1:10pm-6:00pm</td>
</tr>
<tr>
<td>BIOL BC3320</td>
<td>Laboratory in Microbiology</td>
<td>Stephen Sturley</td>
<td>W 1:10pm-6:00pm</td>
</tr>
<tr>
<td>BIOL BC2900</td>
<td>Research Methods Seminar</td>
<td>Elizabeth Bauer/ Jacob Alexander</td>
<td>TH 2:10pm-3:00pm</td>
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<tr>
<td>HSPP BC1001</td>
<td>Research Apprenticeship Seminar</td>
<td>Jonathan Snow</td>
<td>T 4:10pm-6:00pm</td>
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<td>BIOL BC3590*</td>
<td>Senior Seminar in Biology</td>
<td>Stephen Sturley</td>
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<td>Guided Research &amp; Seminar</td>
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<td>BIOL BC3594*</td>
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<td>BIOL BC3597</td>
<td>Guided Research</td>
<td>Various</td>
<td></td>
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</tbody>
</table>

*Full Year Course