BIOLOGY, B.S.

The Bachelor of Science degree is offered for those students aspiring to a professional career in biology, and for those students with particularly strong interests in the discipline. See also Preprofessional Programs. A student pursuing the Bachelor of Science is expected to develop a stronger background in mathematics and related sciences and to attain a greater understanding of biology than will a student pursuing a Bachelor of Arts degree. Bachelor of Science students will also be strongly encouraged to undertake an individual research project with a faculty member during their junior and/or senior year.

The B.S. in Biology offers three concentrations for students to choose from.

Biotechnology Concentration
The concentration in biotechnology is designed for students with a strong interest in molecular biology and genetics. Courses will prepare students in both conceptual aspects of molecular biology and their practical application in biotechnology and genetic engineering.

Environmental Biology Concentration
This concentration is designed for students with a strong interest in environmental biology. The concentration provides students with a breadth and depth of environmental awareness, rigorously prepares them for advanced studies in environmental biology and trains them for environmentally-oriented professions.

Human Biology Concentration
This concentration is designed for biology majors who want to develop the ability to integrate biological knowledge as it relates to human beings. The study of human biology requires fundamental knowledge of basic life science, since humans and other animals share a large number of structural, chemical, and control mechanisms. Moreover, human behavior occurs within a specific evolutionary and ecological setting, just as it does in other animals. Our complex brains, our communication and conceptual abilities, and our social structures, can be more fully understood by those who complete this concentration.

Overall Requirements
- 120 credit hours, to include at least 36 credits at or above the 300 course level.
- Students must have a grade point average of at least 2.0 in Biology courses completed at UNC Greensboro.
- A minimum of 30 credits of Biology courses above the 100 level.
- BIO 280/BIO 280L will not be counted towards the major; instead BIO majors should take BIO 481/BIO 481L.

Degree Program Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 111 &amp; 111L</td>
<td>Principles of Biology I and Principles of Biology I Laboratory</td>
<td>5</td>
</tr>
<tr>
<td>BIO 112 &amp; 112L</td>
<td>Principles of Biology II and Principles of Biology II Laboratory</td>
<td>5</td>
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</tbody>
</table>

B.S. in Biology Core Courses

- BIO 301: Principles of Ecology
- BIO 355: Cell Biology
- BIO 392: Genetics
- BIO 330: Evolution
- BIO 315: Ecology and Evolution Laboratory
- BIO 375: Cell Biology and Genetics Laboratory

Related Area Requirements

- CHE 111: General Chemistry I
- CHE 112: General Chemistry I Laboratory
- CHE 114: General Chemistry II
- CHE 351: Organic Chemistry I
- CHE 103: General Descriptive Chemistry I
- CHE 104: General Descriptive Chemistry II
- CHE 110: Introductory Chemistry Laboratory
- CHE 115: General Chemistry II Laboratory
- CHE 352: Organic Chemistry II

Select one of the following:
- MAT 184: Calculus for the Life Sciences
- MAT 196: Calculus A
- MAT 191: Calculus I
- MAT 296: Calculus B
- MAT 292: Calculus II
- STA 271: Fundamental Concepts of Statistics

Select one of the following:
- PHY 211: General Physics I
- PHY 291: General Physics I with Calculus

Select one of the following if not completed above:
- CHE 352: Organic Chemistry II
- CHE 354: and Organic Chemistry Laboratory
- PHY 212: General Physics II
- PHY 291: General Physics I with Calculus
- MAT 184: Calculus for the Life Sciences
- MAT 196: Calculus A
- MAT 191: Calculus I
- MAT 296: Calculus B
- MAT 292: Calculus II
- STA 271: Fundamental Concepts of Statistics

Students are strongly encouraged to take BIO 100.
Optional Concentrations

Any of the optional concentrations as detailed following the major requirements may be added, but a concentration is not required.

- Biotechnology
- Environmental Biology
- Human Biology

Electives

Electives sufficient to complete the 120 credit hours required for the degree.

Biotechnology Concentration Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>BIO 481</td>
<td>General Microbiology and General Microbiology Laboratory</td>
<td>12-13</td>
</tr>
<tr>
<td>BIO 482</td>
<td>Molecular Biological Approaches in Research</td>
<td></td>
</tr>
</tbody>
</table>

Select one of the following options:

- BIO 424 & 424L: Plant Physiology and Biotechnology and Plant Physiology and Biotechnology Lab
- BIO 494: Introduction to Biotechnology

Select one course (minimum of 3 credits) from the following:

- BIO 424 & 424L: Plant Physiology and Biotechnology and Plant Physiology and Biotechnology Lab
- BIO 435: Biochem:Metabolic Regulation
- BIO 442: GENes and Signals
- BIO 478: Hormones in Action
- BIO 479: Neurobiology and Neurobiology Laboratory
- BIO 485: Virology
- BIO 486: Cell Cycle and Cancer
- BIO 487: Epigenetics
- BIO 494: Introduction to Biotechnology
- BIO 495: Advanced Genetics
- BIO 497: Internship in Biology
- BIO 499: Undergraduate Research

* If not selected above.

Environmental Biology Concentration Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 431</td>
<td>The Biosphere</td>
<td></td>
</tr>
<tr>
<td>BIO 456</td>
<td>Global Change</td>
<td></td>
</tr>
</tbody>
</table>

Select three courses (minimum of 9 credits) from the following:

- BIO 361: Biology and Conservation of Sea Turtles
- BIO 422: Plant Diversity
- BIO 424 & 424L: Plant Physiology and Biotechnology and Plant Physiology and Biotechnology Lab
- BIO 426: Conservation Biology
- BIO 437: Human Evolutionary Genetics
- BIO 445: Disease Ecology
- BIO 451 & 451L: Vascular Plant Systematics and Vascular Plant Systematics Lab
- BIO 456: Global Change
- BIO 460: Symbiosis
- BIO 476: Pop Genetics / Molecular Evol
- BIO 481 & 481L: General Microbiology and General Microbiology Laboratory
- BIO 497: Internship in Biology
- BIO 499: Undergraduate Research

* If not selected above.

Human Biology Concentration Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>BIO 427 &amp; 427L</td>
<td>Landscape Ecology and Landscape Ecology Laboratory</td>
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</tr>
<tr>
<td>BIO 429</td>
<td>Aquatic Ecology</td>
<td></td>
</tr>
<tr>
<td>BIO 431</td>
<td>The Biosphere</td>
<td></td>
</tr>
<tr>
<td>BIO 437</td>
<td>Human Evolutionary Genetics</td>
<td></td>
</tr>
<tr>
<td>BIO 445</td>
<td>Disease Ecology</td>
<td></td>
</tr>
<tr>
<td>BIO 451 &amp; 451L</td>
<td>Vascular Plant Systematics and Vascular Plant Systematics Lab</td>
<td></td>
</tr>
<tr>
<td>BIO 456</td>
<td>Global Change *</td>
<td></td>
</tr>
<tr>
<td>BIO 460</td>
<td>Symbiosis</td>
<td></td>
</tr>
<tr>
<td>BIO 476</td>
<td>Pop Genetics / Molecular Evol</td>
<td></td>
</tr>
<tr>
<td>BIO 481 &amp; 481L</td>
<td>General Microbiology and General Microbiology Laboratory</td>
<td></td>
</tr>
<tr>
<td>BIO 497</td>
<td>Internship in Biology</td>
<td></td>
</tr>
<tr>
<td>BIO 499</td>
<td>Undergraduate Research</td>
<td></td>
</tr>
</tbody>
</table>

* If not selected above.

Disciplinary Honors in Biology

Requirements

- A minimum of 18 credit hours as defined below.
- UNC Greensboro cumulative GPA of 3.30 or better or, for transfer students, cumulative GPA of 3.30 or better from all prior institutions.
- A grade of B or higher in all course work used to satisfy the Honors requirements in Biology.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>HSS 490</td>
<td>Senior Honors Project</td>
<td>6-9</td>
</tr>
</tbody>
</table>
**Application and Admission**

UNC Greensboro undergraduate students who are pursuing a B.A. or B.S. in Biology may apply for admission to the Accelerated Master's Program (AMP) in Biology. Students may apply for admission to the AMP after the completion of 60 credit hours, with at least 30 credits completed at UNCG. Applicants must have a cumulative undergraduate GPA of at least 3.5 at UNCG. All applicants must complete the AMP information when applying for admission to the M.S. in Biology. The standard application requirements for the M.S. in Biology also apply to the AMP.

Undergraduate UNCG students may apply for admission to the AMP after the completion of 60 credit hours, with at least 30 credits completed at UNCG. Applicants must have a cumulative undergraduate GPA of at least 3.5 at UNCG.

**Courses**

Students admitted to the AMP may apply up to, but not more than, 12 credits of graduate-level course work toward completion of both the undergraduate and graduate degree, provided that they earn a grade of B (3.0) or better in the course and fulfill graduate-level requirements. The graduate courses the students will take in the Accelerated Master's Program in Biology must be approved by the Graduate Program Director. Some biology classes are cross-listed as undergraduate and graduate.

For those cross-listed courses offered to both undergraduate and graduate students, a student may not receive graduate credit for corresponding courses previously taken at the undergraduate level.

The following courses may be counted towards both the B.S. or B.A. and the M.S. degrees:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>BIO 601</td>
<td>Seminar in Animal Ecology</td>
<td>3</td>
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<tr>
<td>BIO 605</td>
<td>Seminar in Ecology</td>
<td>3</td>
</tr>
<tr>
<td>BIO 609</td>
<td>Seminar in Molecular Cell Biology</td>
<td>3</td>
</tr>
<tr>
<td>BIO 610</td>
<td>Seminar in Molecular Genetics</td>
<td>3</td>
</tr>
<tr>
<td>BIO 611</td>
<td>Advanced Topics in Animal Ecology</td>
<td>3</td>
</tr>
<tr>
<td>BIO 614</td>
<td>Prenatal Development: Embryology and Teratology</td>
<td>3</td>
</tr>
<tr>
<td>BIO 615</td>
<td>Advanced Topics in Animal Physiology</td>
<td>3</td>
</tr>
<tr>
<td>BIO 617</td>
<td>Advanced Topics in Genetics</td>
<td>3</td>
</tr>
<tr>
<td>BIO 618</td>
<td>Computational Biology</td>
<td>3</td>
</tr>
<tr>
<td>BIO 619</td>
<td>Plant Physiology</td>
<td>3</td>
</tr>
<tr>
<td>BIO 620</td>
<td>Ecosystem Ecology and Biogeochemistry</td>
<td>3</td>
</tr>
<tr>
<td>BIO 624</td>
<td>Advanced Topics in Microbiology</td>
<td>3</td>
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<tr>
<td>BIO 626</td>
<td>Conservation Biology</td>
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</tr>
<tr>
<td>BIO 627</td>
<td>Landscape Ecology</td>
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</tr>
<tr>
<td>BIO 628</td>
<td>Microbial Ecology</td>
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</tr>
<tr>
<td>BIO 629</td>
<td>Aquatic Ecology</td>
<td>3</td>
</tr>
<tr>
<td>BIO 630</td>
<td>Advanced Topics in Plant Ecology</td>
<td>3</td>
</tr>
<tr>
<td>BIO 635</td>
<td>Molecular Toxicology</td>
<td>3</td>
</tr>
<tr>
<td>BIO 636</td>
<td>Ecotoxicology</td>
<td>3</td>
</tr>
<tr>
<td>BIO 637</td>
<td>Human Evolutionary Genetics</td>
<td>3</td>
</tr>
<tr>
<td>BIO 639</td>
<td>Biochemistry: Metabolic Regulation in Health and Disease</td>
<td>3</td>
</tr>
<tr>
<td>BIO 640</td>
<td>Biology of Aging</td>
<td>3</td>
</tr>
<tr>
<td>BIO 641</td>
<td>Stream Ecology</td>
<td>3</td>
</tr>
<tr>
<td>BIO 642</td>
<td>Genes and Signals</td>
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<tr>
<td>BIO 644</td>
<td>Entomology</td>
<td>3</td>
</tr>
<tr>
<td>BIO 645</td>
<td>Disease Ecology and Disease Ecology Laboratory</td>
<td>4</td>
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<tr>
<td>BIO 646</td>
<td>Advanced Topics in Neurobiology</td>
<td>3</td>
</tr>
<tr>
<td>BIO 648</td>
<td>Current Topics in Biology</td>
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<tr>
<td>BIO 651</td>
<td>Vascular Plant Systematics and Vascular Plant Systematics Laboratory</td>
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<td>BIO 652</td>
<td>Metamorphosis</td>
<td>3</td>
</tr>
<tr>
<td>BIO 655</td>
<td>Vertebrate Reproduction</td>
<td>3</td>
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<tr>
<td>BIO 656</td>
<td>Global Change</td>
<td>3</td>
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<tr>
<td>BIO 660</td>
<td>Symbiosis</td>
<td>3</td>
</tr>
<tr>
<td>BIO 673</td>
<td>Drugs and the Brain</td>
<td>3</td>
</tr>
<tr>
<td>BIO 676</td>
<td>Population Genetics and Molecular Evolution</td>
<td>3</td>
</tr>
<tr>
<td>BIO 678</td>
<td>Hormones in Action</td>
<td>3</td>
</tr>
<tr>
<td>BIO 680</td>
<td>Environmental Physiology</td>
<td>3</td>
</tr>
<tr>
<td>BIO 685</td>
<td>Virology</td>
<td>3</td>
</tr>
<tr>
<td>BIO 686</td>
<td>Cell Cycle and Cancer</td>
<td>3</td>
</tr>
<tr>
<td>BIO 687</td>
<td>Epigenetics</td>
<td>3</td>
</tr>
<tr>
<td>BIO 691</td>
<td>Genetics of Complex Traits</td>
<td>3</td>
</tr>
<tr>
<td>BIO 694</td>
<td>Advanced Genetics</td>
<td>3</td>
</tr>
</tbody>
</table>

Students must have completed the appropriate prerequisites required for listed courses or have permission of the department. All courses that lead to the completion of the M.S. in Biology must be approved by the Graduate Program Director. Please consult with an undergraduate advisor to determine how courses taken at the graduate level will meet requirements in the bachelor's degree program. All degree requirements for the M.S. in Biology remain the same.