The Biological Sciences Program at the University of Maryland offers a degree program in Physiology and Neurobiology (PHNB) at the Universities at Shady Grove. The Biological Sciences Program at Shady Grove offers the Advanced Program courses normally taken in the junior and senior years.

All Biological Sciences majors complete a common sequence of introductory and supporting courses referred to as the Basic Program. For students matriculating at the Universities at Shady Grove most of these introductory and supporting courses are taken at a community college or at another four-year institution prior to admission to the Biological Sciences Program. Depending on space available, students who matriculated at College Park may transfer to the Shady Grove Program in their junior year, where they may complete the Advanced Program in Physiology and Neurobiology.

Program Learning Outcomes

1. Students should have mastered the critical knowledge at each level in the curriculum that is necessary to move on to the next level in the curriculum.
2. Students should demonstrate an ability to use and apply quantitative methods, especially: interpretation of graphical or tabular data; expression of physical, chemical, or biological process in mathematical form; solving equations to determine the value of physical, chemical, or biological variables.
3. Students at the lower level should demonstrate an ability to carry out key experimental techniques used in the chemical and life sciences disciplines.
4. Students at the lower level should have a basic understanding of how to express questions as a hypothesis, how to design a test of a hypothesis, and how to gather and analyze simple data.
5. Students at the upper level should be able to integrate and apply a relevant body of basic knowledge to the evaluation of existing scientific studies and to design studies to test specific hypotheses that includes design elements typically found in a specific field of the chemical and life sciences.
6. Students should effectively communicate in writing the processes of science and the results of scientific inquiry.

Requirements

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BSCI170</td>
<td>Principles of Molecular &amp; Cellular Biology</td>
<td>4</td>
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<td>&amp; BSCI171</td>
<td>Principles of Molecular &amp; Cellular Biology Laboratory</td>
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<td>BSCI160</td>
<td>Principles of Ecology and Evolution</td>
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<td>BSCI223</td>
<td>General Microbiology</td>
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<td>BSCI222</td>
<td>Principles of Genetics</td>
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<td>MATH130</td>
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<td>MATH131</td>
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<td>CHEM131</td>
<td>Chemistry I - Fundamentals of General Chemistry</td>
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<td>CHEM231</td>
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<td>CHEM241</td>
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<tr>
<td>CHEM271</td>
<td>General Chemistry and Energetics</td>
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<td>&amp; CHEM272</td>
<td>General Bioanalytical Chemistry Laboratory</td>
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Advanced Program in Physiology and Neurobiology

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<tr>
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<tbody>
<tr>
<td>BCHM461</td>
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<tr>
<td>or BCHM463</td>
<td>Biochemistry of Physiology</td>
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<tr>
<td>BSCI130</td>
<td>Cell Biology and Physiology</td>
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<td>BSCI353</td>
<td>Principles of Neuroscience</td>
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<tr>
<td>BSCI440</td>
<td>Mammalian Physiology</td>
<td>4</td>
</tr>
<tr>
<td>BSCI338</td>
<td>Special Topics in Biology (BSCI338E: Neuroethology)</td>
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</table>

1. Courses equivalent to be taken at an institution that offers lower level course work.
2. CHEM272 is not offered at most institutions. Students accepted into the UMCP Shady Grove Biological Sciences may substitute a General Chemistry II Lab for this course.
BSCI338  Special Topics in Biology (BSCI338G: Seminar on Deregulated Cell Growth in Cancer and Drug Development)
BSCI338  Special Topics in Biology (BSCI338P: Pathophysiology of the Circulatory System)
BSCI338  Special Topics in Biology (BSCI338R: Darwinian Medicine)
BSCI339  Selected Topics in Biology (BSCI339D: Biology of Chemosensory Systems)
BSCI339  Selected Topics in Biology (BSCI339F: Neuropathology of Cells and Circuits)
BSCI339  Selected Topics in Biology (BSCI339G: Advanced Physiology)
BSCI339  Selected Topics in Biology (BSCI339I: Cellular Mechanisms of Aging and Disease)
BSCI339  Selected Topics in Biology (BSCI339Q: Diseases Due to Dysfunctional Cell Organelles)
BSCI339  Selected Topics in Biology (BSCI339W: Molecular Neuroethology)
BSCI339  Selected Topics in Biology (BSCI339X: Advanced Cellular Neuroscience)
BSCI348  Special Topics in Cell Biology and Molecular Genetics (BSCI348C: Cell Biology Lab)
BSCI355  Principles of Animal Behavior
BSCI360  Principles of Evolution
BSCI374  Mathematical Modeling in Biology
BSCI401  Animal Communication
BSCI402  Genomics of Sensory Systems
BSCI403  Biology of Vision
BSCI406  Membranes and Biological Interfaces
BSCI407  Behavioral Genetics
BSCI410  Molecular Genetics
BSCI414  Recombinant DNA Laboratory
BSCI416  Human Genetics
BSCI420  Cell Biology Lectures
BSCI421  Cell Biology
BSCI422  Principles of Immunology
BSCI423  Immunology Laboratory
BSCI430  Developmental Biology
BSCI433  Biology of Cancer
BSCI434  Mammalian Physiology Laboratory
BSCI441  Plant Physiology
BSCI442  Microbial Physiology
BSCI446  Neural Systems
BSCI447  General Endocrinology
BSCI452  Diseases of the Nervous System
BSCI454  Neurobiology Laboratory
BSCI461  Population Ecology
BSCI462  Microbial Ecology
BSCI465  Behavioral Ecology
BIOM301  Introduction to Biometrics

STAT400  Applied Probability and Statistics I
STAT464  Introduction to Biostatistics

Special Topics Courses
BSCI328  Special Topics in Entomology
BSCI338  Special Topics in Biology
BSCI339  Selected Topics in Biology
BSCI348  Special Topics in Cell Biology and Molecular Genetics

Departmental Honors Seminar
BSCI378H  Cell Biology and Molecular Genetics Department Honors Seminar
BSCI398H  Biology Department Honors Seminar

Enrichment
Minimum 3 credits from any 300- or 400-level BSCI, CHEM, or BCHM course.

Total Credits 27

Advising
Advising is mandatory during each pre-registration period for all Biological Sciences majors. Advising for students interested in or enrolled in the Shady Grove Program is available from the director. Call 301-738-6007 for an advising appointment.