BIOLOGICAL SCIENCES MAJOR AT SHADY GROVE

The Universities at Shady Grove
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http://shadygrove.umd.edu/academics/degree-programs/bs-biological-sciences/

Program Director: Dr. Hadiya Woodham
Program Coordinator: Tracy Odim

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

Course	Title	Credits
General Education Program Requirements [1]		
Complete General Education		
Basic Program in Biological Sciences [1]		
BSCI170 & BSCI171	Principles of Molecular & Cellular Biology and Principles of Molecular & Cellular Biology Laboratory	4
BSCI160 & BSCI161	Principles of Ecology and Evolution and Principles of Ecology and Evolution Lab	4
BSCI223	General Microbiology	4
BSCI222	Principles of Genetics	4
MATH130	Calculus I for the Life Sciences	4
or MATH140	Calculus I	
MATH131	Calculus II for Life Sciences	4
or MATH141	Calculus II	
CHEM131 & CHEM132	Chemistry I - Fundamentals of General Chemistry and General Chemistry I Laboratory	4
CHEM231 & CHEM232	Organic Chemistry I and Organic Chemistry Laboratory I	4
CHEM241 & CHEM242	Organic Chemistry II and Organic Chemistry Laboratory II	4
CHEM271 & CHEM272	General Chemistry and Energetics and General Bioanalytical Chemistry Laboratory [2]	4
Courses taken at the Universities at Shady Grove		
PHYS131	Fundamentals of Physics for Life Sciences I	4
or PHYS331	Physics for Life Sciences I	
PHYS132	Fundamentals of Physics for Life Sciences II	4
or PHYS332	Physics for Life Sciences II	
PHNB	Advanced Program in Physiology and Neurobiology	27
ELECT	Electives	22
Total Credits		**97**

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

Advanced Program in Physiology and Neurobiology

Course	Title	Credits
Required Courses		**13**
BCHM461	Biochemistry I	3
or BCHM463	Biochemistry of Physiology	
BSCI330	Cell Biology and Physiology	4
BSCI353	Principles of Neuroscience [1]	3
BSCI450	Mammalian Systems Physiology	3
Physiology and Neurobiology		**11**
BSCI338	Special Topics in Biology (BSCI338E: Neuroethology)	

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: Neurophysiology 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) [2,3]
BSCI355	Neurobiology of Extraordinary Senses
BSCI360	Principles of Animal Behavior
BSCI370	Principles of Evolution
BSCI374	Mathematical Modeling in Biology [4]
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	
BSCI422	Principles of Immunology
BSCI423	Immunology Laboratory [3]
BSCI430	Developmental Biology
BSCI433	Biology of Cancer
BSCI434	
BSCI442	Plant Physiology
BSCI443	Microbial Physiology
BSCI446	Neural Systems
BSCI447	General Endocrinology
BSCI452	Diseases of the Nervous System
BSCI454	Neurobiology Laboratory [3]
BSCI462	Population Ecology
BSCI464	Microbial Ecology
BSCI465	Behavioral Ecology
Statistics, one course maximum	
BIOM301	Introduction to Biometrics
STAT400	Applied Probability and Statistics I
STAT464	Introduction to Biostatistics
Special Topics Courses [5]	
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 [6]	
BSCI378H	Cell Biology and Molecular Genetics Department Honors Seminar
BSCI398H	Biology Department Honors Seminar
Enrichment	**3**
Minimum 3 credits from any 300- or 400-level BSCI, CHEM, or BCHM course.	
Total Credits	**40**

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.