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 Principles of Molecular & Cellular Biology 4
& BSCI171 and Principles of Molecular & Cellular Biology Laboratory

BSCI160 Principles of Ecology and Evolution 4
& BSCI161 and Principles of Ecology and Evolution Lab

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 Chemistry I - Fundamentals of General Chemistry 4
& CHEM132 General Chemistry I Laboratory

CHEM231 Organic Chemistry I 4
& CHEM232 and Organic Chemistry Laboratory I

CHEM241 Organic Chemistry II 4
& CHEM242 and Organic Chemistry Laboratory II

CHEM271 General Chemistry and Energetics 4
& CHEM272 and General Bioanalytical Chemistry Laboratory 2

PHYS131 Fundamentals of Physics for Life Sciences I 4
or PHYS331 Physics for Life Sciences II

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 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 (BSCI339J: Diseases Due to Dysfunctional Cell Organelles)

### BSCI339
Selected Topics in Biology (BSCI339L: Molecular Neuroethology)

### BSCI339
Selected Topics in Biology (BSCI339M: Advanced Cellular Neuroscience)

### BSCI348
Special Topics in Cell Biology and Molecular Genetics (BSCI348C: Cell Biology Lab)

### BSCI355
Neurobiology of Extraordinary Senses

### BSCI360
Principles of Animal Behavior

### 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

### BSCI420
Cell Biology Lectures

### BSCI421
Principles of Immunology

### BSCI423
Immunology Laboratory

### BSCI430
Developmental Biology

### BSCI433
Biology of Cancer

### BSCI442
Plant Physiology

### BSCI443
Microbial Physiology

### BSCI446
Neural Systems

### BSCI447
General Endocrinology

### BSCI452
Diseases of the Nervous System

### BSCI454
Neurobiology Laboratory

### BSCI462
Population Ecology

### BSCI464
Microbial Ecology

### BSCI465
Behavioral Ecology

### BIOM301
Introduction to Biometrics

### STAT400
Applied Probability and Statistics I

### STAT464
Introduction to Biostatistics

### BSCI328
Special Topics in Entomology

### BSCI338
Special Topics in Biology

### BSCI339
Selected Topics in Biology

### BSCI348
Special Topics in Cell Biology and Molecular Genetics

### BSCI378H
Cell Biology and Molecular Genetics Department Honors Seminar

### BSCI398H
Biology Department Honors Seminar

### STAT464
Introduction to Biostatistics

### BSCI328
Special Topics in Entomology

### BSCI338
Special Topics in Biology

### BSCI339
Selected Topics in Biology

### BSCI348
Special Topics in Cell Biology and Molecular Genetics

### 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
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.