

# BIOLOGICAL SCIENCES MAJOR

## College of Computer, Mathematical and Natural Sciences

1322 Symons Hall

301-405-6892

estaylor@umd.edu

bsci.umd.edu (<http://bsci.umd.edu>)

The Biological Sciences major exposes students to the modern experimental disciplines within biology and prepares them for diverse careers in health care, research, policy, teaching, and academia. Upper level courses are organized into specialization areas, aligned with the major research areas in modern biology ranging from molecular and cellular studies to ecosystem studies.

Students in the Biological Sciences major will have the following academic components to their curriculum.

- **Basic program and supporting Courses: 47 - 48 credits**
- **Advanced Program in one of the following specialization area: 27 credits**
  - **Cell Biology and Genetics**
  - **General Biology**
  - **Microbiology**
  - **Ecology and Evolution**
  - **Physiology and Neurobiology**
  - **Individualized Studies requires permission of Assistant Dean**
- **General Education requirements: 27 credits**
- **Electives: 18 - 19 credits**

**Total credits required to graduate: 120**

The Biological Sciences major is jointly offered by the Departments of **Biology**, **Cell Biology & Molecular Genetics**, and **Entomology** in the College of Computer, Mathematical, and Natural Sciences. The central Biological Sciences Program office in 1322 Symons Hall is staffed by:

- Dr. Joelle Presson, Assistant Dean. [jpresson@umd.edu](mailto:jpresson@umd.edu) (%20jpresson@umd.edu)
- Dr. Francisca Saavedra, Assistant Director. [saavedra@umd.edu](mailto:saavedra@umd.edu)
- Ms. Elaine Shaw-Taylor, Office Coordinator. [estaylor@umd.edu](mailto:estaylor@umd.edu) (%20estaylor@umd.edu)

Departmental contacts for Biological Sciences are:

- Dr. Reid Compton, Undergraduate Director Biology. [compton@umd.edu](mailto:compton@umd.edu)
- Dr. Dave Straney, Undergraduate Director Cell Biology & Molecular Genetics. [straney@umd.edu](mailto:straney@umd.edu)
- Dr. Brett Kent, Undergraduate Director Entomology. [kent@umd.edu](mailto:kent@umd.edu)

## Biological Sciences Program Specializations

All Biological Sciences majors complete a common sequence of introductory and supporting courses referred to as the basic program. In addition, students must complete an advanced program within one of the following specialization areas:

- Cell Biology & Genetics (CEBG)
- Ecology & Evolution (ECEV)
- General Biology (GENB)
- Microbiology (MICB)
- Physiology & Neurobiology (PHNB)
- Individualized Studies (BIVS)

A complete list of specialization area requirements can be found on our website, [bsci.umd.edu](http://bsci.umd.edu) (<http://bsci.umd.edu>). Note that the Individualized Studies specialization (BIVS) requires permission of the Assistant Dean of Undergraduate Academic Programs, and involves an approved proposal to do coursework in the College and in other disciplines. Further questions about Biological Sciences can be directed to the Undergraduate Academic Program Office at 301-405-6892.

## BIOLOGICAL SCIENCES AT THE UNIVERSITY OF MARYLAND AT SHADY GROVE

The Biological Sciences Program at the University of Maryland offers a degree program at Universities at Shady Grove. The Biological Sciences Program at Shady Grove offers the Advanced Program courses normally taken in the junior and senior years. More information is available at: <https://www.shadygrove.umd.edu/academics/degree-programs/bs-biological-sciences> (<https://www.shadygrove.umd.edu/academics/degree-programs/bs-biological-sciences/>).

## ADMISSION TO THE MAJOR

The Biological Sciences major is a Limited Enrollment Program. Please see the admission requirements and procedures at: [lep.umd.edu](http://lep.umd.edu) (<http://lep.umd.edu/>).

## PLACEMENT IN COURSES

Enrollment in BSCI170&171 and BSCI160&161 requires eligibility to take MATH120 or MATH140, either through direct placement by the Math Placement Exam, or completion of MATH113 or 115. Note that students who are ready to take MATH135 will have an eligibility for MATH140, and thus are eligible to enroll in BSCI160&161 and BSCI170&171.

Students who earn Advanced Placement or International Baccalaureate Placement credit which grants equivalency for BSCI170&171 and/or BSCI161&161 are encouraged not to repeat these courses at UMD, but can continue to courses for which BSCI170&171 and/or 160&161 satisfy prerequisite requirements.

## 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.

- 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.
- 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.
- Students should effectively communicate in writing the processes of science and the results of scientific inquiry.

## Advising

Information on BSCI advising can be found at: <http://bsci.umd.edu/advising/>.

All freshmen and new transfer students will be assigned an advisor from the College of Computer, Mathematical, and Natural Sciences Student Services advising staff. Students will be assigned to a departmental faculty advisor once a basic sequence of courses has been successfully completed. The departmental faculty advisors are coordinated by the following persons for the indicated specialization areas. These coordinating advising offices can be contacted for making appointments with an advisor or for any other information regarding that specialization area.

Specializations CEBG,GENB,MICB  
Department of Cell Biology & Molecular Genetics  
Undergraduate office:

1109 Microbiology  
Phone: 301-405-2766

Undergraduate Director: Dr. Straney  
3122 Microbiology  
Phone: 301-405-1622  
[straney@umd.edu](mailto:straney@umd.edu)

Specialization: GENB  
Department of Entomology  
Main Office:

4112 Plant Sciences Building  
Phone: 301-405-3911

Undergraduate Director: Dr. Kent  
4112 Plant Sciences Building  
Phone: 301-405-3125  
[bkent@umd.edu](mailto:bkent@umd.edu)

Specializations: ECEV and PHNB

Department of Biology

Undergraduate office:

1204A Biology-Psychology Building  
Phone: 301-405-6904  
[biundergrad@umd.edu](mailto:biundergrad@umd.edu)

Undergraduate Director: Dr. Compton  
1204F Biology-Psychology Building  
Phone: 301-405-6916  
[compton@umd.edu](mailto:compton@umd.edu)

Specialization: BIVS, Secondary Education, Science in the Evening  
College of Computer, Mathematical, and Natural Sciences

Undergraduate Academic Programs Office

1322 Symons Hall  
Phone: 301-405-6892

Assistant Dean: Dr. Presson  
1322 Symons Hall  
Phone: 301-405-6892  
[jpresson@umd.edu](mailto:jpresson@umd.edu)

Laboratory research, fieldwork, and internships are valuable co-curricular experiences which add value to a student's academic experience in CMNS disciplines. We encourage students to pursue one or more of these experiences during their undergraduate studies. Please see the College website (<http://cmns.umd.edu/undergraduate/research-internships>) for more information about experiential learning for CMNS undergraduates.

## Requirements

Course	Title	Credits
<b>Basic Program and supporting courses in Biological Sciences</b>		
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
BSCI207	Principles of Biology III - Organismal Biology	3
BSCI222	Principles of Genetics	4
UNIV100	The Student in the University <sup>1</sup>	1
<b>Supporting Courses <sup>2</sup></b>		
MATH135 & MATH136	Discrete Mathematics for Life Sciences and Calculus for Life Sciences	8
or		
MATH140 & MATH141	Calculus I and Calculus II	8
Or		
MATH140 & MATH135	Calculus I and Discrete Mathematics for Life Sciences	8
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	4
PHYS131 or PHYS141	Fundamentals of Physics for Life Sciences I or Principles of Physics	4
PHYS132 or PHYS142	Fundamentals of Physics for Life Sciences II or Principles of Physics	4
Please see below for details on the Advanced Program requirements for each specialization area.		

<sup>1</sup> All students who matriculate at UMD as Freshman Biological Sciences majors must take UNIV100 or another approved Freshman Seminar course. See your advisor for details.

<sup>2</sup> MATH140 and MATH141 taken together will fulfill the Mathematics Supporting Courses requirement; however, MATH135 and MATH136 were designed specifically for Biological Sciences majors. Students who enter the Biological Sciences major after satisfactorily completing MATH140 should take MATH135 instead of MATH141.

## Advanced Program Requirements

All Biological Sciences majors must complete an Advanced Program within one of the specialization areas described below. Students must complete a minimum of 27 credits of Advanced Program study.

For all specialization areas:

- At least two courses designated as lab at the 300 or 400 level must be taken as part of the Advanced Program.
  - Stand alone lab courses require a C- or better in the pre / co-requisite lecture to count as the upper level Lab requirement
- Independent study or research credits, including H and L versions, are acceptable up to a maximum of 3 credits overall in the Advanced Program.
- Multiple semesters in research courses can possibly count for one of the two required lab courses. See your advisor for more details.
- One credit of Departmental Honors Seminar can count toward the Advanced Program major credits. Additional Departmental Honors Seminar credits can count as electives toward the 120 credits required for graduation.
- Special topics courses are approved for specific specialization areas. See [testudo.umd.edu](https://www.testudo.umd.edu/) (<https://www.testudo.umd.edu/>) to determine if a particular special topics course is approved for your specialization area.
- All specialization areas except General Biology have an Enrichment category. Enrichment allows students to include a maximum of 3 credits from any 300-level or 400-level BSCI, CHEM, or BCHM course in their Advanced Program. Courses from other departments can be used with permission of advisor. Courses listed in the Advanced Program can be used if they are not used to satisfy any specific Advance program category. Courses counted as Enrichment do not satisfy the requirement to take two 300- or 400-level laboratory courses.

## Cell Biology & Genetics 0404A

Course	Title	Credits
<b>Required Courses</b>		<b>16</b>
BCHM461	Biochemistry I	3
BCHM462	Biochemistry II	3
BSCI330	Cell Biology and Physiology (Lab)	4
BSCI410	Molecular Genetics	3
BSCI420	Cell Biology Lectures	3
<b>CEBG Area courses. One course from the Cell Biology group and one course from the Genetics group must be taken. Other credits can be taken from any group.</b>		<b>8</b>
<b>Cell Biology Courses</b>		
BSCI353	Principles of Neuroscience	3
BSCI404	Cell Biology from a Biophysical Perspective	3
BSCI417	Microbial Pathogenesis <sup>1</sup>	3
BSCI422	Principles of Immunology <sup>1</sup>	3
BSCI423	Immunology Laboratory <sup>1</sup>	2

BSCI430	Developmental Biology	3
BSCI433	Biology of Cancer	3
BSCI442	Plant Physiology (Lab)	4
BSCI443	Microbial Physiology <sup>1</sup>	3
BSCI454	Neurobiology Laboratory <sup>3</sup>	1

### Genetics Courses

BSCI402	Genomics of Sensory Systems	3
BSCI405	Population and Evolutionary Genetics (Lab)	3
BSCI407	Behavioral Genetics	3
BSCI411	Bioinformatics and Integrated Genomics (Lab)	4
BSCI412	Microbial Genetics (Lab) <sup>1</sup>	4
BSCI414	Recombinant DNA Laboratory	3
BSCI415	Molecular Genetics Laboratory	3
BSCI416	Human Genetics	3
BCHM465	Biochemistry III	3

### Additional CEBG Courses

BSCI223	General Microbiology <sup>2</sup>	4
BSCI283	Principles of Microbiology <sup>2</sup>	4
BSCI374	Mathematical Modeling in Biology <sup>3</sup>	4
BSCI425	Advanced Cell Biology Lab Practices	2
BSCI427	Principles of Microscopy	2
BSCI437	General Virology	3
BCHM464	Biochemistry Laboratory	3
BIOM301	Introduction to Biometrics <sup>4</sup>	3
STAT400	Applied Probability and Statistics I <sup>4</sup>	3
STAT464	Introduction to Biostatistics <sup>4</sup>	3

### Special Topics Courses

BSCI328	Special Topics in Entomology	1-4
BSCI338	Special Topics in Biology	1-4
BSCI339	Selected Topics in Biology	1-4
BSCI348	Special Topics in Cell Biology and Molecular Genetics	1-4

### Departmental Honors Seminar

BSCI378H	Cell Biology and Molecular Genetics Department Honors Seminar	1
BSCI398H	Biology Department Honors Seminar	1

### Enrichment

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

<sup>1</sup> BSCI223/283 is a pre-requisite for these upper level courses.

<sup>2</sup> Credit will be given for either BSCI223 OR BSCI283. Credit cannot be granted for both courses. BSCI223/283 may count in the CEBG Area credits but NOT as an upper level lab.

<sup>3</sup> Formerly BSCI474, cross-listed as HLSC374. Credit will be given for either BSCI374, HLSC374 or BSCI474.

<sup>4</sup> Only one of these statistics courses will count for the CEBG Area courses.

## Ecology & Evolution 0404B

Course	Title	Credits
<b>Required Courses</b>		<b>10</b>
BSCI361	Principles of Ecology	4

BSCI370	Principles of Evolution	3
Select one of the following Statistics Courses:		
BIOM301	Introduction to Biometrics	3
STAT400	Applied Probability and Statistics I	3
STAT464	Introduction to Biostatistics	3
<b>Ecology and Evolution Area Courses.</b>		<b>14</b>
300-Level Courses		
BSCI330	Cell Biology and Physiology (Lab)	4
BSCI333	Principles of Paleontology (Lab)	4
BSCI334	Mammalogy	3
BSCI335	Mammalogy Laboratory	1
BSCI337	Biology of Insects (Lab)	4
BSCI360	Principles of Animal Behavior	3
BSCI363	The Biology of Conservation and Extinction	3
BSCI364	Conservation Biology Lab	1
BSCI373	Natural History of the Chesapeake Bay	3
BSCI374	Mathematical Modeling in Biology (Lab) <sup>1</sup>	4
BSCI392	Biology of Extinct Animals	3
BSCI393	Biology of Extinct Animals Laboratory	1
400-Level Courses. At least two 400-level courses must be taken.		
BSCI401	Animal Communication	3
BSCI403	Biology of Vision	3
BSCI405	Population and Evolutionary Genetics (Lab)	3
BSCI407	Behavioral Genetics	3
BSCI410	Molecular Genetics	3
BSCI430	Developmental Biology	3
BSCI460	Plant Ecology <sup>2</sup>	3
BSCI461	<sup>2</sup>	2
BSCI462	Population Ecology	3
BSCI464	Microbial Ecology	3
BSCI465	Behavioral Ecology	3
BSCI467	Freshwater Biology (Lab)	4
BSCI471	Molecular Evolution	3
BSCI473	Marine Ecology	3
BSCI475	Sexual Selection in Nature	3
BSCI480	Arthropod Form and Function (Lab)	4
BSCI481	Insect Diversity and Classification (Lab)	4
BSCI483	Insects, Pathogens, and Public Health	3
BSCI494	Animal-Plant Interactions	3
Special Topics Courses		
BSCI328	Special Topics in Entomology	1-4
BSCI338	Special Topics in Biology	1-4
BSCI339	Selected Topics in Biology	1-4
BSCI348	Special Topics in Cell Biology and Molecular Genetics	1-4
Department Honors Seminar		
BSCI378H	Cell Biology and Molecular Genetics Department Honors Seminar	1
BSCI398H	Biology Department Honors Seminar	1
<b>Enrichment</b>		<b>3</b>

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

<sup>1</sup> Formerly BSCI474, cross-listed as HLSC374. Credit will be given for either BSCI374, HLSC374 or BSCI474.

<sup>2</sup> BSCI460 and BSCI461 count as one required 400-level course. They do not satisfy the two 400-level courses requirement alone.

## General Biology 0404C

Course	Title	Credits
<b>Required Courses</b>		
BCHM461	Biochemistry I	3
or BCHM463	Biochemistry of Physiology	3
Select one of the following Quantitative Courses:		3-4
BIOM301	Introduction to Biometrics	3
BSCI374	Mathematical Modeling in Biology (Lab) <sup>1</sup>	4
STAT400	Applied Probability and Statistics I	3
STAT464	Introduction to Biostatistics	3
MATH240	Introduction to Linear Algebra	4
<b>General Biology Area Courses. At least one course from each area: 20-21</b>		
<b>Genetics &amp; Evolution, Cell Biology, Development, &amp; Physiology, and Ecology, Behavior, &amp; Organismal.</b>		
<b>Genetics and Evolution</b>		
BCHM465	Biochemistry III	3
BSCI370	Principles of Evolution	3
BSCI402	Genomics of Sensory Systems	3
BSCI405	Population and Evolutionary Genetics (Lab)	3
BSCI407	Behavioral Genetics	3
BSCI410	Molecular Genetics	3
BSCI411	Bioinformatics and Integrated Genomics (Lab)	4
BSCI412	Microbial Genetics (Lab)	4
BSCI414	Recombinant DNA Laboratory	3
BSCI415	Molecular Genetics Laboratory	3
BSCI416	Human Genetics	3
BSCI471	Molecular Evolution	3
<b>Cell Biology, Development, and Physiology</b>		
BCHM462	Biochemistry II	3
BCHM464	Biochemistry Laboratory	3
BSCI330	Cell Biology and Physiology (Lab)	4
BSCI342	Biology of Reproduction	3
BSCI348	Special Topics in Cell Biology and Molecular Genetics (BSCI348C: Cell Biology Lab)	1-4
BSCI353	Principles of Neuroscience	3
BSCI404	Cell Biology from a Biophysical Perspective	3
BSCI417	Microbial Pathogenesis	3
BSCI420	Cell Biology Lectures	3
BSCI422	Principles of Immunology	3
BSCI425	Advanced Cell Biology Lab Practices (Lab)	2
BSCI423	Immunology Laboratory (Lab)	2
BSCI424	Pathogenic Microbiology (Lab)	4
BSCI430	Developmental Biology	3
BSCI433	Biology of Cancer	3
BSCI437	General Virology	3
BSCI440	Mammalian Physiology	4
BSCI441	Mammalian Physiology Laboratory (Lab)	2

BSCI442	Plant Physiology (Lab)	4
BSCI443	Microbial Physiology	3
BSCI446	Neural Systems	3
BSCI447	General Endocrinology	3
BSCI452	Diseases of the Nervous System	3
BSCI454	Neurobiology Laboratory (Lab)	1
<b>Ecology, Behavior, and Organismal</b>		
BSCI333	Principles of Paleontology (Lab)	4
BSCI334	Mammalogy	3
BSCI335	Mammalogy Laboratory	1
BSCI337	Biology of Insects (Lab)	4
BSCI360	Principles of Animal Behavior	3
BSCI361	Principles of Ecology	4
BSCI363	The Biology of Conservation and Extinction	3
BSCI364	Conservation Biology Lab (Lab)	1
BSCI373	Natural History of the Chesapeake Bay	3
BSCI392	Biology of Extinct Animals	3
BSCI393	Biology of Extinct Animals Laboratory (Lab)	1
BSCI401	Animal Communication	3
BSCI403	Biology of Vision	3
BSCI460	Plant Ecology	3
BSCI461	(Lab)	2
BSCI462	Population Ecology	3
BSCI464	Microbial Ecology	3
BSCI465	Behavioral Ecology	3
BSCI467	Freshwater Biology (Lab)	4
BSCI473	Marine Ecology	3
BSCI480	Arthropod Form and Function (Lab)	4
BSCI481	Insect Diversity and Classification (Lab)	4
BSCI483	Insects, Pathogens, and Public Health	3
BSCI494	Animal-Plant Interactions	3
<b>Additional Courses (Optional)</b>		
BSCI223	General Microbiology <sup>2</sup>	4
or BSCI283	Principles of Microbiology	
<b>Departmental Honors Seminars</b>		
BSCI378H	Cell Biology and Molecular Genetics Department Honors Seminar	1
BSCI398H	Biology Department Honors Seminar	1
<b>Special Topics Courses</b>		
BSCI328	Special Topics in Entomology	1-4
BSCI338	Special Topics in Biology	1-4
BSCI339	Selected Topics in Biology	1-4
BSCI348	Special Topics in Cell Biology and Molecular Genetics	1-4
<b>Department Research Credit</b>		
BSCI379	Cell Biology and Molecular Genetics Department Research	1-3
BSCI389	Entomology Department Research	1-2
BSCI399	Biology Department Research	1-3

<sup>1</sup> Formerly BSCI474, cross-listed as HLSC374. Credit will be given for either BSCI374, HLSC374 or BSCI474.

<sup>2</sup> Credit will be given for either BSCI223 OR BSCI283. BSCI223/283 is a pre-requisite for some upper level BSCI courses. BSCI223/283 may count in the GENB Area credits but NOT as an upper-level lab

## Microbiology 0404D

Course	Title	Credits
<b>Required Courses</b>		
BSCI283	Principles of Microbiology <sup>1</sup>	4
BSCI412	Microbial Genetics (Lab)	4
BSCI443	Microbial Physiology	3
<b>Biochemistry Courses</b>		
BCHM461 & BCHM462	Biochemistry I and Biochemistry II	6
Or		
BCHM463 & BCHM465	Biochemistry of Physiology and Biochemistry III	6
<b>Microbiology Area Courses</b>		
BSCI411	Bioinformatics and Integrated Genomics (Lab)	4
BSCI417	Microbial Pathogenesis	3
BSCI422	Principles of Immunology	3
BSCI423	Immunology Laboratory	2
BSCI424	Pathogenic Microbiology (Lab)	4
BSCI437	General Virology	3
BSCI464	Microbial Ecology	3
<b>Special Topics Courses</b>		
BSCI338	Special Topics in Biology	1-4
BSCI339	Selected Topics in Biology	1-4
BSCI348	Special Topics in Cell Biology and Molecular Genetics	1-4
<b>Departmental Honors Seminars</b>		
BSCI378H	Cell Biology and Molecular Genetics Department Honors Seminar	1
BSCI398H	Biology Department Honors Seminar	1
<b>Enrichment</b>		
<b>3</b>		

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

<sup>1</sup> or BSCI223 with permission of Undergraduate Program Director. Students cannot get credit for both BSCI223 and BSCI283.

## Physiology & Neurobiology 0404E

Course	Title	Credits
<b>Required Courses</b>		
BCHM461 or BCHM463	Biochemistry I Biochemistry of Physiology	3
BSCI330	Cell Biology and Physiology (Lab)	4
BSCI353	Principles of Neuroscience <sup>1</sup>	3
BSCI440	Mammalian Physiology	4
<b>Physiology and Neurobiology area courses</b>		
BCHM462	Biochemistry II	3
BCHM464	Biochemistry Laboratory	3
BCHM485	Physical Biochemistry	3
BSCI360	Principles of Animal Behavior	3
BSCI370	Principles of Evolution	3

BSCI374	Mathematical Modeling in Biology (Lab) <sup>2</sup>	4
BSCI401	Animal Communication	3
BSCI402	Genomics of Sensory Systems	3
BSCI403	Biology of Vision	3
BSCI407	Behavioral Genetics	3
BSCI410	Molecular Genetics	3
BSCI414	Recombinant DNA Laboratory	3
BSCI416	Human Genetics	3
BSCI420	Cell Biology Lectures	3
BSCI422	Principles of Immunology	3
BSCI425	Advanced Cell Biology Lab Practices	2
BSCI423	Immunology Laboratory	2
BSCI430	Developmental Biology	3
BSCI433	Biology of Cancer	3
BSCI434	(Lab)	4
BSCI441	Mammalian Physiology Laboratory	2
BSCI442	Plant Physiology (Lab)	4
BSCI443	Microbial Physiology	3
BSCI446	Neural Systems	3
BSCI447	General Endocrinology	3
BSCI452	Diseases of the Nervous System	3
BSCI454	Neurobiology Laboratory	1
Statistics, one course maximum		
BIOM301	Introduction to Biometrics	3
STAT400	Applied Probability and Statistics I	3
STAT464	Introduction to Biostatistics	3
Special Topics Courses		
BSCI328	Special Topics in Entomology	1-4
BSCI338	Special Topics in Biology	1-4
BSCI339	Selected Topics in Biology	1-4
BSCI348	Special Topics in Cell Biology and Molecular Genetics	1-4
Departmental Honors Seminars		
BSCI378H	Cell Biology and Molecular Genetics Department Honors Seminar	1
BSCI398H	Biology Department Honors Seminar	1
<b>Enrichment</b>		<b>3</b>
Minimum 3 credits from any 300- or 400-level BSCI, CHEM, or BCHM course.		

<sup>1</sup> Starting Fall 2012, only BSCI353 satisfies the Neurobiology course requirement that was previously fulfilled by BSCI446 or BSCI453.

<sup>2</sup> Formerly BSCI474, cross-listed as HLSC374. Credit will be given for either BSCI374, HLSC374 or BSCI474.

## Individualized Studies 0404

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The Individualized Studies specialization (BIVS) requires permission of the Assistant Dean of Undergraduate Academic Programs, and involves an approved proposal to do coursework in the College and in other disciplines.

### Required Courses

- Six credits in biochemistry and/or quantitative coursework, approved by advisor

### Individualized Studies Area Courses

- 21 credits approved by advisor
- Maximum of 4 credits at the 200-level
- At least 3 credits, but a maximum of 6 credits, from courses outside of CMNS, cannot double count as Advanced Program
- Courses taken to satisfy Advanced Program must support BIVS topic
- At least two upper-level labs
- Lab courses offered as separate credit must be successfully completed with lecture as co- or pre-requisite
- Must include two credits for independent research paper related to BIVS topic, written under the direction of advisor

## OTHER REQUIREMENTS FOR THE BIOLOGICAL SCIENCES MAJOR

Students receiving a degree in the Biological Sciences from the University of Maryland must earn at least 120 credits with a cumulative minimum GPA of 2.000 in all courses being counted toward the degree as well as in all courses associated with the major. Additionally, all Biological Sciences major courses must have a grade of "C-" or better.

## Opportunities Internships

See <http://cmns.umd.edu/undergraduate/research-internships> (<http://cmns.umd.edu/undergraduate/research-internships/>).

## Honors Program

Outstanding students are encouraged to apply to departmental Honors Programs. Through the Honors Programs students will become actively involved in the ongoing scientific research at the university. Information about these honors programs may be obtained from the Undergraduate Academic Programs Office, 1322 Symons Hall, 301-405-6892.

## Student Societies and Professional Organizations

Information on Biological Sciences and other CMNS student organizations can be found at <http://cmns.umd.edu/sab> (<http://cmns.umd.edu/sab/>).

## ACADEMIC PROGRAMS AND DEPARTMENTAL FACILITIES

In addition to offering high quality undergraduate specializations in the Biological Sciences, the BSCI program participates in the collaborative program in secondary teaching, Terrapin Teachers, [terrapinteachers.umd.edu](http://terrapinteachers.umd.edu) (<http://terrapinteachers.umd.edu>).

This program allows students to develop their expertise at communicating science to diverse audiences and provides a path toward certification to teach secondary school science or math.

## Four Year Plan

Click here (<https://cmns.umd.edu/undergraduate/advising-academic-planning/academic-planning/four-year-plans/four-year-plans-gened/>) for

roadmaps for four-year plans in the College of Computer, Mathematical, and Natural Sciences.

Additional information on developing a four-year academic plan can be found on the following pages:

- [4yearplans.umd.edu \(http://4yearplans.umd.edu/\)](http://4yearplans.umd.edu/)
- the Student Academic Success-Degree Completion Policy (<https://academiccatalog.umd.edu/undergraduate/registration-academic-requirements-regulations/academic-advising/>) section of this catalog