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 & Genetics (CEBG)
  - Ecology & Evolution (ECEB)
  - General Biology (GENB)
  - Microbiology (MICB)
  - Physiology & Neurobiology (PHNB)
  - Individualized Studies (BIVS)
- **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 (%20jpresson@umd.edu)
- Dr. Francisca Saavedra, Assistant Director. saavedra@umd.edu
- Ms. Elaine Shaw-Taylor, Office Coordinator. estaylor@umd.edu (%20estaylor@umd.edu)

Departmental contacts for Biological Sciences are:

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

A complete list of specialization area requirements can be found on our website, 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/).

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 BSCI160&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.
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.

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

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

Specializations: ECEV and PHNB
Department of Biology
Undergraduate office: 1204A Biology-Psychology Building
Phone: 301-405-6904
bioundergrad@umd.edu
Undergraduate Director: Dr. Compton
1204F Biology-Psychology Building
Phone: 301-405-6916
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

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic Program and supporting courses in Biological Sciences</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BSCI170 &amp; BSCI171</td>
<td>Principles of Molecular &amp; Cellular Biology and Principles of Molecular &amp; Cellular Biology Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>BSCI160 &amp; BSCI161</td>
<td>Principles of Ecology and Evolution and Principles of Ecology and Evolution Lab</td>
<td>4</td>
</tr>
<tr>
<td>BSCI207</td>
<td>Principles of Biology III - Organismal Biology</td>
<td>3</td>
</tr>
<tr>
<td>BSCI222</td>
<td>Principles of Genetics</td>
<td>4</td>
</tr>
<tr>
<td>UNIV100</td>
<td>The Student in the University (^1)</td>
<td>1</td>
</tr>
<tr>
<td><strong>Supporting Courses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH135 &amp; MATH136</td>
<td>Discrete Mathematics for Life Sciences and Calculus for Life Sciences</td>
<td>8</td>
</tr>
<tr>
<td>or MATH140 &amp; MATH141</td>
<td>Calculus I and Calculus II</td>
<td>8</td>
</tr>
<tr>
<td>or MATH140 &amp; MATH135</td>
<td>Calculus I and Discrete Mathematics for Life Sciences</td>
<td>8</td>
</tr>
<tr>
<td>CHEM131 &amp; CHEM132</td>
<td>Chemistry I - Fundamentals of General Chemistry and General Chemistry I Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>CHEM231 &amp; CHEM232</td>
<td>Organic Chemistry I and Organic Chemistry Laboratory I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM241 &amp; CHEM242</td>
<td>Organic Chemistry II and Organic Chemistry Laboratory II</td>
<td>4</td>
</tr>
<tr>
<td>CHEM271 &amp; CHEM272</td>
<td>General Chemistry and Energetics and General Bioanalytical Chemistry Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>PHYS131 or PHYS141</td>
<td>Fundamentals of Physics for Life Sciences I or Principles of Physics</td>
<td>4</td>
</tr>
<tr>
<td>PHYS132 or PHYS142</td>
<td>Fundamentals of Physics for Life Sciences II or Principles of Physics</td>
<td>4</td>
</tr>
</tbody>
</table>

Please see below for details on the Advanced Program requirements for each specialization area.

\(^1\) 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.
Cell Biology & Genetics 0404A

**Course** | **Title** | **Credits**
--- | --- | ---
**Required Courses** | 16 | 3
BCHM461 | Biochemistry I | 3
BCHM462 | Biochemistry II | 3
BSCI330 | Cell Biology and Physiology (Lab) | 4
BSCI410 | Molecular Genetics | 3
BSCI420 | Cell Biology Lectures | 3

**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.**

<table>
<thead>
<tr>
<th><strong>Course</strong></th>
<th><strong>Credits</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>BSCI335</td>
<td>3</td>
</tr>
<tr>
<td>BSCI344</td>
<td>3</td>
</tr>
<tr>
<td>BSCI416</td>
<td>3</td>
</tr>
<tr>
<td>BSCI417</td>
<td>3</td>
</tr>
<tr>
<td>BSCI420</td>
<td>3</td>
</tr>
<tr>
<td>BSCI422</td>
<td>3</td>
</tr>
<tr>
<td>BSCI423</td>
<td>2</td>
</tr>
</tbody>
</table>

**Biology Department Honors Seminar**

<table>
<thead>
<tr>
<th><strong>Course</strong></th>
<th><strong>Title</strong></th>
<th><strong>Credits</strong></th>
</tr>
</thead>
</table>
| BSCI423 | General Microbiology | 2
| BSCI423 | Principles of Microbiology | 2
| BSCI437 | General Virology | 3
| BSCI454 | Neurobiology Laboratory | 3
| BSCI402 | Genomics of Sensory Systems | 3
| BSCI407 | Behavioral 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
| BCHM465 | Biochemistry III | 3

**Special Topics in Cell Biology and Molecular Genetics**

<table>
<thead>
<tr>
<th><strong>Course</strong></th>
<th><strong>Title</strong></th>
<th><strong>Credits</strong></th>
</tr>
</thead>
</table>
| BSCI223 | Cell Biology and Molecular Genetics Department Honors Seminar | 1
| BSCI398H | Biology Department Honors Seminar | 1

**Enrichment**

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

---

1 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.

2 MATH135 and MATH136 are designed specifically for Biological Sciences majors. Students with prior biology credits who enter the Biological Sciences major after satisfactorily completing MATH140 should take MATH135 instead of MATH141.

3 Formerly BSCI474, cross-listed as HLSC374. Credit will be given for either BSCI474, cross-listed as HLSC374, or BSCI474.

4 Only one of these statistics courses will count for the CEBG Area courses.

---

2 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/) 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.

---

**Ecology & Evolution 0404B**

**Course** | **Title** | **Credits**
--- | --- | ---
**Required Courses** | 10 | 4
BSCI361 | Principles of Ecology | 4
BSCI370  Principles of Evolution 3
Select one of the following Statistics Courses: 3
BIOM301  Introduction to Biometrics 3
STAT400  Applied Probability and Statistics I 3
STAT464  Introduction to Biostatistics 3

Ecology and Evolution Area Courses. 14
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) 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 2
BSCI461  Plant Ecology 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

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

1 Formerly BSCI474, cross-listed as HLSC374. Credit will be given for either BSCI374, HLSC374 or BSCI474.
2 BSCI460 and BSCI461 count as one required 400-level course. They do not satisfy the two 400-level courses requirement alone.

General Biology 0404C

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Required Courses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biochemistry</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>BCHM461</td>
<td>Biochemistry I</td>
<td>3</td>
</tr>
<tr>
<td>or BCHM463</td>
<td>Biochemistry of Physiology</td>
<td></td>
</tr>
<tr>
<td>Select one of the following Quantitative Courses:</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>BIOM301</td>
<td>Introduction to Biometrics</td>
<td>3</td>
</tr>
<tr>
<td>BSCI374</td>
<td>Mathematical Modeling in Biology (Lab)</td>
<td>4</td>
</tr>
<tr>
<td>STAT400</td>
<td>Applied Probability and Statistics I</td>
<td>3</td>
</tr>
<tr>
<td>STAT464</td>
<td>Introduction to Biostatistics</td>
<td></td>
</tr>
<tr>
<td>MATH240</td>
<td>Introduction to Linear Algebra</td>
<td>4</td>
</tr>
</tbody>
</table>

**General Biology Area Courses. At least one course from each area: 20-21**

Genetics & Evolution, Cell Biology, Development, & Physiology, and Ecology, Behavior, & Organismal.

Genetics and Evolution
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

Cell Biology, Development, and Physiology
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

\[ \text{Credits} \]
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

Ecology, Behavior, and Organismal
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

Additional Courses (Optional)
BSCI223 General Microbiology  4
or BSCI283 Principles of Microbiology

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

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 Research Credit
BSCI379 Cell Biology and Molecular Genetics Department Research  1-3
BSCI389 Entomology Department Research  1-2
BSCI399 Biology Department Research  1-3

Microbiology 0404D

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BSCI283</td>
<td>Principles of Microbiology</td>
<td>4</td>
</tr>
<tr>
<td>BSCI412</td>
<td>Microbial Genetics (Lab)</td>
<td>4</td>
</tr>
<tr>
<td>BSCI443</td>
<td>Microbial Physiology</td>
<td>3</td>
</tr>
<tr>
<td>Biochemistry Courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCHM461</td>
<td>Biochemistry I</td>
<td>6</td>
</tr>
<tr>
<td>&amp; BCHM462 &amp; BCHM465 &amp; Biochemistry II</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Or</td>
<td>Biochemistry of Physiology</td>
<td>6</td>
</tr>
<tr>
<td>BCHM463</td>
<td>Biochemistry of Physiology</td>
<td>6</td>
</tr>
<tr>
<td>BCHM465</td>
<td>Biochemistry of Physiology</td>
<td></td>
</tr>
</tbody>
</table>

Microbiology Area Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSCI411</td>
<td>Bioinformatics and Integrated Genomics (Lab)</td>
<td>4</td>
</tr>
<tr>
<td>BSCI417</td>
<td>Microbial Pathogenesis</td>
<td>3</td>
</tr>
<tr>
<td>BSCI422</td>
<td>Principles of Immunology</td>
<td>3</td>
</tr>
<tr>
<td>BSCI423</td>
<td>Immunology Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>BSCI424</td>
<td>Pathogenic Microbiology (Lab)</td>
<td>4</td>
</tr>
<tr>
<td>BSCI437</td>
<td>General Virology</td>
<td>3</td>
</tr>
<tr>
<td>BSCI464</td>
<td>Microbial Ecology</td>
<td>3</td>
</tr>
</tbody>
</table>

Special Topics Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSCI338</td>
<td>Special Topics in Biology</td>
<td>1-4</td>
</tr>
<tr>
<td>BSCI339</td>
<td>Selected Topics in Biology</td>
<td>1-4</td>
</tr>
<tr>
<td>BSCI348</td>
<td>Special Topics in Cell Biology and Molecular Genetics</td>
<td>1-4</td>
</tr>
</tbody>
</table>

Departmental Honors Seminars

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSCI378H</td>
<td>Cell Biology and Molecular Genetics Department Honors Seminar</td>
<td>1</td>
</tr>
<tr>
<td>BSCI398H</td>
<td>Biology Department Honors Seminar</td>
<td>1</td>
</tr>
</tbody>
</table>

Enrichment

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum 3 credits from any 300- or 400-level BSCI, CHEM, or BCHM course.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Physiology & Neurobiology 0404E

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCHM461</td>
<td>Biochemistry I</td>
<td>3</td>
</tr>
<tr>
<td>or BCHM463</td>
<td>Biochemistry of Physiology</td>
<td></td>
</tr>
<tr>
<td>BSCI330</td>
<td>Cell Biology and Physiology (Lab)</td>
<td>4</td>
</tr>
<tr>
<td>BSCI353</td>
<td>Principles of Neuroscience</td>
<td>3</td>
</tr>
<tr>
<td>BSCI440</td>
<td>Mammalian Physiology</td>
<td>4</td>
</tr>
</tbody>
</table>

Physiology and Neurobiology area courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCHM462</td>
<td>Biochemistry II</td>
<td>3</td>
</tr>
<tr>
<td>BCHM464</td>
<td>Biochemistry Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>BCHM485</td>
<td>Physical Biochemistry</td>
<td>3</td>
</tr>
<tr>
<td>BSCI360</td>
<td>Principles of Animal Behavior</td>
<td>3</td>
</tr>
<tr>
<td>BSCI370</td>
<td>Principles of Evolution</td>
<td>3</td>
</tr>
</tbody>
</table>

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

2 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.
### Individualized Studies 0404

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). 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 detailed four-year plans.
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/)
- the Student Academic Success-Degree Completion Policy (https://academiccatalog.umd.edu/undergraduate/registration-academic-requirements-regulations/academic-advising/) section of this catalog