B.S., BIOLOGICAL SCIENCES WITH CONCENTRATION

Program Requirements
Students must earn a C- grade or better in each course.

Minimum Requirements for Biological Sciences B.S.: 120 credits

CONCENTRATIONS: BIOMEDICAL SCIENCE (P. 1); CELL AND MOLECULAR BIOLOGY (P. 2); ECOLOGY AND EVOLUTIONARY BIOLOGY (P. 2); PHYSIOLOGY (P. 2)

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<td>BIOL F260</td>
<td>Principles of Genetics</td>
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<td>BIOL F481</td>
<td>Principles of Evolution</td>
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<td>CHEM F321</td>
<td>Organic Chemistry I</td>
<td>4</td>
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<td>CHEM F325</td>
<td>Organic Chemistry II</td>
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<tr>
<td>or CHEM F351</td>
<td>General Biochemistry. Metabolism</td>
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<td>PHYS F123X</td>
<td>College Physics I</td>
<td>4</td>
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<tr>
<td>or PHYS F211X</td>
<td>General Physics I</td>
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<td>PHYS F124X</td>
<td>College Physics II</td>
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<td>or PHYS F212X</td>
<td>General Physics II</td>
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<tr>
<td>or CS F103</td>
<td>Introduction to Computer Programming</td>
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<td>or CS F201</td>
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Complete one from the following four options: 4-8

BIOL F111X and BIOL F112X | Human Anatomy and Physiology I and Human Anatomy and Physiology II
BIOL F310 | Animal Physiology
BIOL F342 | Microbiology

BIOL F434 | Structure and Function of Vascular Plants

Concentration
Complete one from the following concentrations: 21-28

1. Cell and Molecular Biology
2. Physiology
3. Ecology and Evolutionary Biology
4. Biomedical Science

Capstone 2

<table>
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<tr>
<td>BIOL F400</td>
<td>Biological Sciences Capstone Project</td>
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Satisfactory completion of a capstone research project which can be done either working individually with a faculty member or within one of the following courses: 3,4

BIOL F434 | Structure and Function of Vascular Plants
BIOL F440 | Behavioral Neuroscience Research Capstone
BIOL F441 | Animal Behavior
BIOL F466 | Advanced Cell and Molecular Laboratory
BIOL F472 | Community Ecology
BIOL F473 | Limnology
BIOL F491 | The Human Microbiome

1. BIOL F397, BIOL F497, URSA F388 or URSA F488 courses may be substituted by petition for a maximum of two required elective courses in biology (3-4 credits of independent study or research per substituted course). The subject area of the independent study or research will determine which biological subject areas the credits satisfy.

2. Fulfills the baccalaureate capstone requirement.

3. Students working individually with a faculty member may, for example, take BIOL F497 credits or work with a faculty member without taking course credits.

4. Capstone courses may be double counted as electives.

Note: A foreign language is encouraged by the department to meet the general education requirements.

Concentrations

BIOMEDICAL SCIENCE

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<tr>
<td>ECON F120X</td>
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<td>or ECON F101X</td>
<td>Principles of Microeconomics</td>
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<td>or ECON F102X</td>
<td>Principles of Macroeconomics</td>
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<tr>
<td>PSY F101X</td>
<td>Introduction to Psychology</td>
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<td>SOC F101X</td>
<td>Introduction to Sociology</td>
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As part of the general education requirements the following are recommended:

Complete the following as part of the program requirements:

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<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIOL F111X</td>
<td>Human Anatomy and Physiology I</td>
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<tr>
<td>or BIOL F112X</td>
<td>Human Anatomy and Physiology II</td>
<td></td>
</tr>
<tr>
<td>or BIOL F310</td>
<td>Animal Physiology</td>
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<tr>
<td>CHEM F325</td>
<td>Organic Chemistry II</td>
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<tr>
<td>PHYS F124X</td>
<td>College Physics II</td>
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</table>
B.S., Biological Sciences with Concentration

or PHYS F212X General Physics II

Complete the following:
- BIOL F342 Microbiology 4
- BIOL F360 Cell and Molecular Biology 3
- CHEM F351 General Biochemistry: Metabolism 3

Biology Breadth Electives
Complete one additional course from lists C or D 3-4

Biomedical Electives
Complete at least three additional courses from list E 9-12

CELL AND MOLECULAR BIOLOGY

As part of the program requirements above, complete:
- CHEM F325 Organic Chemistry II 4
- Complete the following:
  - BIOL F360 Cell and Molecular Biology 3
  - CHEM F450 Information Storage and Transfer: Molecules and Pathways 3
  - CHEM F351 General Biochemistry: Metabolism 3

Cell and Molecular and Physiology Electives
Complete one additional course from list A 3-4
Complete two additional courses from lists A or B 6-8

Biology Breadth Elective
Complete one additional course from lists C or D 3-4

ECOLOGY AND EVOLUTIONARY BIOLOGY

As part of the program requirements above, complete:
- BIOL F371 Principles of Ecology 4
- Complete two additional courses from list C 6-8

Organismal Elective
Complete one additional course from list D 3-4

Biology Breadth Elective
Complete one additional course from lists A, B, or E 3-4

Biology Elective
Complete one additional course from lists A, B, C, or E 3-4

PHYSIOLOGY

As part of the program requirements above, complete:
- BIOL F360 Cell and Molecular Biology 3
- Complete two additional courses from list C or D 3-4

Biological Elective
Complete one additional course from lists A, B, C, D, or E 3-4

Biology Elective Course Lists

Courses that satisfy upper-division elective credit may require prerequisites.

LIST A - CELL AND MOLECULAR BIOLOGY

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<td>BIOL F360</td>
<td>Cell and Molecular Biology</td>
<td>3</td>
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<td>BIOL F417</td>
<td>Neurobiology</td>
<td>3</td>
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<tr>
<td>BIOL F435</td>
<td>Introduction to Biology of Cancer</td>
<td>3</td>
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<td>BIOL F460</td>
<td>Principles of Virology</td>
<td>3</td>
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<td>BIOL F462</td>
<td>Infectious Diseases</td>
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<td>BIOL F465</td>
<td>Immunology</td>
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<td>BIOL F466</td>
<td>Advanced Cell and Molecular Laboratory</td>
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<td>BIOL F491</td>
<td>The Human Microbiome</td>
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<td>CHEM F325</td>
<td>Organic Chemistry II</td>
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<td>CHEM F351</td>
<td>General Biochemistry: Metabolism</td>
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<td>CHEM F450</td>
<td>Information Storage and Transfer: Molecules and Pathways</td>
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<td>CHEM F470</td>
<td>Cellular and Molecular Neuroscience</td>
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<td>CHEM F474</td>
<td>Neurochemistry</td>
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LIST B - PHYSIOLOGY

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<td>Medical Physiology</td>
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<td>Principles of Epidemiology</td>
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<td>BIOL F342</td>
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<td>Structure and Function of Vascular Plants</td>
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<td>BIOL F440</td>
<td>Behavioral Neuroscience Research Capstone</td>
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<td>BIOL F441</td>
<td>Animal Behavior</td>
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<td>BIOL F455</td>
<td>Environmental Toxicology</td>
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<td>BIOL F457</td>
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LIST C - ECOLOGY AND EVOLUTIONARY BIOLOGY

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<td>BIOL F385</td>
<td>Global Change Biology</td>
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<td>BIOL F415</td>
<td>Systematic and Comparative Biology</td>
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<td>BIOL F418</td>
<td>Biogeography</td>
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<td>Freshwater Habitat Dynamics</td>
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LIST D - ORGANISMAL BIOLOGY

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<td>Systematic Botany</td>
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<td>BIOL F489</td>
<td>Vegetation Description and Analysis</td>
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LIST E - BIOMEDICAL SCIENCE

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<td>Biomedical and Research Ethics</td>
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