BIOLOGY (BS)

Exploration and Discovery

The BS in Biology prepares students for graduate or professional schools including medical, dental, and veterinary schools, and broadly prepares students in cellular, physiological, organismal, ecological and evolutionary biology. Note that some professional/graduate schools require a full year of physics and that students should work closely with their academic advisor to plan their coursework.

Biological Sciences Honors Program

The Department of Biological Sciences encourages eligible students to develop an Honors research project working with an individual faculty member. A Biology Faculty Advisor will serve as a research mentor throughout the process, but the student is responsible for the design, data collection, analysis, and writing required to complete and communicate the results of the project. Students must understand that faculty can more readily advise Honors projects that integrate with their existing research interests. The Honors project can assist students wishing to pursue admission to competitive graduate and professional programs in biological sciences. Along with letters of recommendation, solid grade point average and Graduate Record Exam scores, participating in research is an important criterion such programs use to select students.

Requirements for Admission to the Honors Program

- 3.25 minimum grade point average
- completion of at least 45 credit hours
- completion of Biological Science I (BI 1110) and Biological Science II (BI 1120) or their equivalents and at least one 3000/4000 level Biology course that involves a research project, or approval of the faculty sponsor
- availability and support of a Faculty Advisor
- submission of an Honors Application to the Department of Biological Sciences. The Application consists of a research proposal that is developed with the guidance and approval of a Faculty Advisor and contains a literature review, hypotheses, methods (including a budget), and references (formatted according to discipline-specific standards)
- approval of the Honors Application by the Biological Sciences faculty.

Completing the Program

- completion of four credits of Undergraduate Research (BI 4950)
- presentation of the research findings
- submission of a final paper (in discipline-specific format) to the Department of Biological Sciences by May 1 of the year Honors distinction is sought
- presentation of the results at an appropriate scientific conference or seminar series, either at PSU or in the New England region
- overall approval of both the final paper and the presentation from the Biological Science faculty
- maintenance of a 3.25 minimum grade point average.

Degree Requirements

Course	Title	Credits
Major Requirements		
BI 1110	Biological Science I (TECO)	4
BI 1120	Biological Science II	4
BI 2270	Integrative Biology (WECO)	4
BI 3060	Genetics	4
BI 3130	Evolution	4
BI 3240	Conservation (DICO,GACO,INCO,INCP)	3
BI 4970	Biology Seminar	1
CH 1050	Laboratory Safety	1
CH 2335	General Chemistry I (QRCO)	4
CH 2340	General Chemistry II	4
CH 3370	Organic Chemistry I	4
CH 3380	Organic Chemistry II	4
Lower Level Organismal Electives		
Complete two courses from the following:		8
BI 2030	Invertebrate Zoology	
BI 2040	Vertebrate Zoology	
BI 2070	Botany	
BI 2110 & BI 2130	Human Anatomy and Physiology I and Human Anatomy and Physiology Laboratory I	
BI 2120 & BI 2140	Human Anatomy and Physiology II and Human Anatomy and Physiology Laboratory II	
Upper Level Biology Electives		
Complete 19-20 credits of 3000/4000 level Biology courses not including BI 3060, BI 3130, BI 3240, and BI 4970 (one must be a Writing in the Discipline Connection)		19-20
Physics		
PH 2410 or PH 2210	University Physics I Physics I	3
PH 2430	Physics Laboratory I	1
Mathematics Foundations		
MA 2130 or MA 2550	Precalculus (QRCO) Calculus I (QRCO)	4
General Education (https://coursecatalog.plymouth.edu/general-education/)		
EN 1400	Composition	4
IS 1115	Tackling a Wicked Problem	4
CTDI (https://coursecatalog.plymouth.edu/general-education/#CTDI)	Creative Thought Direction	3-4
PPDI (https://coursecatalog.plymouth.edu/general-education/#PPDI)	Past and Present Direction	3-4
SSDI (https://coursecatalog.plymouth.edu/general-education/#SSDI)	Self and Society Direction	3-4
Directions (choose from CTDI, PPDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/) [1]		4-8
Electives		19-20
Total Credits		**120**

[1] Directions should total 16-17 credits because SIDI is waived for BS Biology.

Recommended Course Sequence

Check all course descriptions for prerequisites before planning course schedule. Course sequence is suggested but not required.

To complete the bachelor's degree in 4 years, you must successfully complete a minimum of 15 credits each semester or have a plan to make up credits over the course of the 4 years. For example, if you take 14 credits one semester, you need to take 16 credits in another semester. Credits completed must count toward your program requirements (major, option, minor, certificate, general education or free electives).

Course	Title	Credits
Year One		
EN 1400	Composition	4
IS 1115	Tackling a Wicked Problem	4
Mathematics Foundations Course:		
MA 2130 or MA 2550	Precalculus (QRCO) or Calculus I (QRCO)	4
BI 1110	Biological Science I (TECO)	4
BI 1120	Biological Science II	4
CH 1050	Laboratory Safety	1
CH 2335	General Chemistry I (QRCO) [1]	4
CH 2340	General Chemistry II [1]	4
Elective		2
	Credits	**31**
Year Two		
BI 2270	Integrative Biology (WECO)	4
Complete two Lower Level Organismal Elective Courses from the following:		8
BI 2030	Invertebrate Zoology	
BI 2040	Vertebrate Zoology	
BI 2070	Botany	
BI 2110 & BI 2130	Human Anatomy and Physiology I and Human Anatomy and Physiology Laboratory I	
BI 2120 & BI 2140	Human Anatomy and Physiology II and Human Anatomy and Physiology Laboratory II	
BI 3060	Genetics	4
CH 3370	Organic Chemistry I	4
CH 3380	Organic Chemistry II	4
CTDI (https://coursecatalog.plymou general-education/#CTDI)	Creative Thought Direction	3-4
SSDI (https://coursecatalog.plymouth.edu/general-education/#SSDI)	Self and Society Direction	3-4
	Credits	**30-32**
Year Three		
BI	3000/4000 level Biology courses	15-16
BI	Biology Writing Connection	4
Complete one course from the following:		3
PH 2410 or PH 2210	University Physics I or Physics I	
PH 2430	Physics Laboratory I	1
Directions (choose from CTDI, PPDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/) [2]		4-8
	Credits	**27-32**
Year Four		
BI 3130	Evolution	4
BI 3240	Conservation (DICO,GACO,INCO,INCP)	3
BI 4970	Biology Seminar	1
PPDI (https://coursecatalog.plymouth.edu/general-education/#PPDI)	Past and Present Direction	3-4
Electives		17-18
	Credits	**28-30**
	Total Credits	**120**

[1] General Chemistry should only be taken in the first year if the student has suitable math skills.

[2] Directions should total 17-16 credits because SIDI is waived for BS Biology.

Learning Outcomes

Our BS programs require more background in chemistry and physics in support of this outcome, while our BA program allows for greater breadth.

- An understanding of the scientific method as the means to increase understanding of the natural world through hypothesis-testing.
- An aptitude for critically reading scientific literature, including primary research journals.
- Proficiency in writing, especially in scientific format.
- An ability to present scientific information orally with emphasis on clear interpretation of scientific data.
- Proficiency in techniques specific to a subdiscipline of biology, including but not limited to laboratory, field, and statistical techniques.
- An understanding of the critical issues facing the environment at local, regional, national, and global scales.
- Biological literacy allowing for the evaluation of new information and emerging issues.
- Readiness for post-graduate experiences in graduate school, professional school, or biology employment

Career Pathways

Biologists study living organisms and their relationships to the environment from molecules, to cells, to ecosystems. Most specialize in a particular discipline within biology, sometimes by pursuing a specialized degree like Environmental Biology or Cell and Molecular Biology. Some go on to attain further education in graduate school or a health professional school for medicine, public health, or pharmacy. There are as many job opportunities as areas of study.

For more information, visit Career Services in the Global Education Office.

Sample Job Titles include: Biochemist, Botanist, Ecologist, Fishery Biologist, High School Science Teacher, Marine Biologist, Microbiologist, Zoologist, Veterinarian, Medical doctor, Physician Assistant, Nurse Practitioner, Doctor of Osteopathic Medicine, Research Scientist, Wildlife Biologist, Pharmacist, Dentist, Medical scientist, Virologist

See the U.S. Department of Labor Outlook for a complete list.

Useful Skills for Jobs in the Biology Fields

- Research skills such as data collection, laboratory techniques, and working in teams
- Ability to problem-solve and think critically
- Written and verbal communication skills to convey technical and scientific data to both scientific and non-scientific communities