

Curriculum map

Biology B.S./B.A. (Marine Biology LOs on page 4)

Learning outcomes (LOs): Having completed a major in Biology, a student will demonstrate:

1. A broad-based knowledge of biology at multiple levels; an understanding of the different levels of biological organization, from molecules to ecosystems.
2. An awareness of biological diversity and an understanding that all living organisms are genetically-related- a result of the ongoing process of biological evolution.
3. Competency in reading, understanding, and critically evaluating scientific information across major areas of the curriculum (cellular/molecular, systems/organisms, ecology/evolution).
4. An understanding of the process and application of scientific inquiry; the ability to develop well-reasoned experimental hypotheses and design experiments by which to test them.
5. An ability to apply mathematical or statistical approaches to understanding biological information; an ability to interpret graphical representations of biological information.
6. An ability to communicate scientific ideas clearly, orally and in writing, in forms appropriate to both general and professional audiences.
7. An understanding of the importance of biological science in a modern society.

Key: I = introduces outcome; D = develops outcome; A = assesses mastery of outcome

Course(s)	Title/description	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7
	Lower Division Biology. Majors must complete either the General Biology or Honors Biology sequence.							
BI 211	General Biology I: Cells	I	I	I	I	I	I	I
BI 212	General Biology II: Organisms	I	I	I/D	I	I/D	I	I
BI 213	General Biology III: Populations	I	I	I	I	I	I	I
BI 214	General Biology IV: Mechanisms		D		D	D		I
BI 281H	Honors Biology I: Cells, Biochemistry & Physiology	I/D	I	I/D	I	I/D	I	I
BI 282H	Honors Biology II: Genetics & Molecular Biology	I/D		I	I/D	I		
BI 283H	Honors Biology III: Evolution, Diversity & Ecology	I/D	D	I/D	I	I/D	I	I
	Upper Division Biology. Majors must complete a minimum of 44 upper division credits including: 1. At least one course completed from Areas I, II and III 2. At least two courses at the 300 or 400 level with a major laboratory or field component* 3. At least 12 credits with a BI prefix numbered 410-499							
BI 306*	Pollination Biology		D	A	A	A	A	D
BI 307 *	Forest Biology		D	D	D	D		D
BI 309	Tropical Diseases in Africa	A	D	D	D	D	D	A
BI 320	Molecular Genetics (Area I)			D	D/A	D	I/D	I

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Course(s)	Title/description	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7
BI 322	Cell Biology (Area I)	D	D					D
BI 328*	Developmental Biology (Area I)	I	D	D	D			I
BI 330	Microbiology (Area II when taken with BI 331)							
BI 331*	Microbiology Laboratory	A		D	D	A	D	
BI 353	Sensory Physiology (Area II)	D		I/D	D/A	I/D/A		
BI 356*	Animal Physiology (Area II)	D	D		D	D	D	D
BI 357*	Marine Biology (Area III)	D	D/A	D	D	D	I/D	I/D
BI 358	Investigations in Medical Physiology (Area II)	D		A	D		A	D
BI 359	Plant Biology (Area II)	D	D	D	D	D	I	I
BI 360	Neurobiology (Area I)	D	D	D	D	D	D	D
BI 370*	Ecology (Area III)	A	D	D	A	A	D	D
BI 372*	Field Biology (Area III)							
BI 374	Conservation Biology (Area III)	D	D	A	D	D	A	A
BI 375	Biological Diversity (Area III)	A	A	D	I	I	A	A
BI 380	Evolution (Area III)	D	D	D	D	D	D	D
BI 390	Animal Behavior (Area III)	D	D	A	A	D	D	A
BI 399	The Visual System (Area II)	D	D	A	A	D	D	D
BI 410	HIV/AIDS in Africa	A	D	A	A	D	A	A
BI 410	Introduction to Programming for Biologists					D/A	I/D	
BI 410	Microbial Ecology							
BI 410	Model Organisms			A	D	D		
BI 410	Molecular Genetics of Human Disease	A		A	A	A	A	A
BI 410*	Advanced Molecular Genetics Research Lab			A	A		A	
BI 410	Tropical Marine Ecology	A	A	A	D	D	A	A
BI 410*	Marine Microbiology: <i>Topic</i>	A	A	A	D	A	D	A
BI 410	Neural Basis of Cognition (new spring 2015)	D	D	A	A	A	D	D
BI 422	Protein Toxins in Cell Biology	A	A	A	A	A	A	A
BI 423	Human Molecular Genetics		D	A	A	D	D/A	D
BI 424	Advanced Molecular Genetics			A	A		A	D
BI 425*	Advanced Molecular Biology Research Lab	D	D	D	A	D	D	D
BI 426	Genetics of Cancer		D	A	A	D	A	I
BI 428	Developmental Genetics	A	A	A	A	A	A	A
BI 433	Bacterial-Host Interactions	A	A	A	A	D	A	D
BI 442*	Systematic Botany	X	X	X				X
BI 461	Systems Neuroscience	I/D/A	I	I/D/A	I/D/A	I/D/A	D/A	
BI 464	Biological Clocks	D/A	A	A			A	A

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Course(s)	Title/description	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7
BI 466	Developmental Neurobiology			A	A		D	D
BI 471	Population Ecology	A	A	A	A	A	A	A
BI 472	Community Ecology	A	A	A	A	D	A	A
BI 473*	Quantitative Ecology	D	D	D	A	A	A	DA
BI 476	Terrestrial Ecosystem Ecology	A	I	A	D	D	D	D
BI 478/479*	Neotropical Ecology & Neotropical Ecology Field Study	D	A	A	A	D	A	A
BI 485*	Techniques in Computational Neuroscience			D	D	A		
BI 486	Population Genetics	A	A		A	A	A	
BI 488	Evolutionary Processes	D	A	A	A	D	A	
BI 493	Genomic Approaches & Analysis		I		A	A	A	I
BI 496	Conservation Genetics	A	A		A	A	A	A
	<i>Courses offered at OIMB: Can be used to satisfy Biology major requirements.</i>							
BI 390	Animal Behavior	D	D	D	A	D	A	I
BI 451*	Invertebrate Zoology	D	A	D	D		A	I
BI 454*	Estuarine Biology	A	A	A	A	A	A	D
BI 455*	Marine Birds and Mammals	D	A	D	D	D	A	D
BI 457*	Marine Biology: Biology of Fishes	D	A	D	A	A	A	D
BI 457*	Marine Biology: Comparative Embryology and Larval Biology	A	A	A	A	D	A	D
BI 457*	Marine Biology: Marine Environmental Issues		D	D	D	D	A	A
BI 457*	Marine Biology: Marine Molecular Biology	A	D	D	A	A	A	D
BI 457*	Marine Biology: Subtidal and Deep-Sea Ecology	A	D	A	A	A	A	D
BI 458*	Biological Oceanography	A	A	A	A	A	A	D
BI 474*	Marine Ecology	D	A	A	A	A	A	I
OXLA 488*	Marine Biology Panama	I	D	D	A	D	A	D

Learning outcomes explanations

Marine Biology B.S./B.A.

Learning outcomes (LOs): Having completed a major in Marine Biology, a student will demonstrate:

1. A broad-based knowledge of biology at multiple levels; an understanding of the different levels of biological organization, from molecules to ecosystems; an understanding that all living organisms are genetically related - a result of the ongoing process of biological evolution.
2. An awareness of biological diversity in the marine environment and the mechanisms that shape this diversity.
3. An understanding of the mechanisms that influence the structure and function of marine communities and ecosystems, and an appreciation for the bathymetric and biogeographic distributions of organisms in the sea.
4. An awareness of both global and local environmental challenges in the marine environment.
5. Competency in reading, understanding, and critically evaluating scientific information across major areas of the curriculum (cellular/molecular, systems/organisms, ecology/evolution); an ability to communicate scientific ideas clearly, both orally and in writing to both general and professional audiences.
6. An understanding of the process and application of scientific inquiry; the ability to develop and test well-reasoned hypotheses in both the field and laboratory; an ability to apply mathematical or statistical approaches to biological data, and to interpret graphical representations of biological information.
7. An appreciation of the advantages of field-based research and the importance of biological science to modern society

General Education offerings Biology

The Department of Biology normally offers between six to eight 100-level general education courses each year. While the specific subject matter varies among these diverse courses, some common learning objectives include promoting the understanding of:

1. living organisms and life processes.
2. the process of science, from making observations to formulating hypotheses, to designing studies/experiments to test hypotheses and drawing conclusions based on study/experimental results.
3. the quantitative nature of biology, including the interpretation of graphs and other visual presentations of biological data and the application of statistical analyses to biological questions.

All courses seek to increase scientific literacy in order to critically evaluate scientific information and make informed decisions about personal issues as well as current societal challenges rooted in biology. For example, BI 121, 122, 123 and 140 prepare students to make informed choices related to their health, while BI 130, 140 and 150 help students understand larger societal issues like stem cells and cloning, genetically modified organisms, global climate change, loss of biological diversity and human impacts on ecosystems.

Our 100-level general education courses include:

- BI 121 Introduction to Human Physiology
- BI 122 Introduction to Human Genetics*
- BI 123 Biology of Cancer*
- BI 130 Introduction to Ecology
- BI 131 Introduction to Evolution
- BI 132 Introduction to Animal Behavior*
- BI 140 Science, Policy and Biology*
- BI 150 The Ocean Planet*

Several of these courses are offered in collaboration with the Science Literacy Program*. The SLP's mission, which aligns well with our learning objectives, is to "promote student-centered teaching and communication of science where non-science majors are empowered to consider scientific approaches to societal issues and have the opportunity to learn how to process and critique scientific information."