Biology (BI)

Courses

BI 121. Introduction to Human Physiology. 4 Credits.
Study of body functions with emphasis on organs and systems. Cell function, genetics, nutrition, exercise; function of the gut, heart, vessels, glands, lungs, nerves, and muscles with practical applications. Lecture, laboratories.
Additional Information:
Science Area

BI 123. Biology of Cancer. 4 Credits.
Comparison of cancer cells with normal cells; causes of cancer, including viral and environmental factors; biological basis of therapy. Lectures, laboratories.
Additional Information:
Science Area

BI 125. Biology of Immortality. 4 Credits.
Is immortality possible? Aging increases the risk of maladies such as cancer, heart disease, and memory loss, and inevitably leads to death. However, some organisms escape aging altogether - that is, are theoretically immortal. In this course, we will examine the interesting biology that underlies aging, the evolutionary explanations for why different species age at different rates, and the approaches that have been shown to extend lifespan. Throughout, we will consider the ethical implications of experimenting on living things and of manipulating lifespan.
Additional Information:
Science Area

BI 130. Introduction to Ecology. 4 Credits.
The concept of an ecosystem; organismal energetics; biogeochemical cycles; succession; population growth; species interactions, species diversity; implications for human ecosystems. Lectures, discussions.
Additional Information:
Science Area

BI 132. Introduction to Animal Behavior. 4 Credits.
Animal behavior, its evolutionary origins, and its neural mechanisms. Readings and films illustrate the adaptive nature of orientation, navigation, communication, and social behavior. Lectures, discussions.
Additional Information:
Science Area

BI 140. Science, Policy, and Biology. 4 Credits.
Explores the biology behind important topical issues such as stem cells, cloning, and genetically modified organisms. How policy decisions affect research in these areas. Lectures, discussions.
Additional Information:
Science Area

BI 150. Ocean Planet. 4 Credits.
This course is designed to give students an appreciation for the global ocean, the diversity of marine life, methods and techniques for studying the sea, and their own opportunities to contribute to sustainable and healthy marine ecosystems. Credits will be deducted for regression if BI 357 is taken first. Students cannot receive credit for both BI 150 and ERTH 307.
Equivalent to: ERTH 307
Additional Information:
Science Area

BI 170. Happiness: a Neuroscience and Psychology Perspective. 4 Credits.
Examination of studies in neuroscience and positive psychology that explore the mental and behavioral actions leading to the self-reporting of a well-lived and fulfilling life. Exploration of the interaction of multiple psychological and neural circuit variables in development of a positive mental state.
Additional Information:
Science Area

BI 185M. Science and Popular Media. 4 Credits.
By evaluating how science stories are told, reflecting on their impact, and taking some first steps in creating science stories, we will explore a powerful approach to critical thinking about scientific information and its role in popular media. Multilisted with JCOM 185M.
Additional Information:
Science Area

BI 196. Field Studies: [Topic]. 1-2 Credits.
A series of practical experiences on or off campus to understand principles or develop skills in performing selected tasks.
Repeatable 99 times

BI 198. Laboratory Projects: [Topic]. 1-12 Credits.
An experience in a lab setting in which a group of students focus on skills development rather than content master.
Repeatable 99 times

BI 199. Special Studies: [Topic]. 1-5 Credits.
Experimental course - topic varies.
Repeatable 99 times

BI 199L. Special Studies: [Topic]. 4 Credits.
Experimental course - topic varies.
Repeatable 99 times

BI 214. General Biology IV: Biochemistry and Genetics. 5 Credits.
Topics in Biochemistry: Amino Acid Chemistry, Protein Structure and Function, Hemoglobin, DNA Structure and Mutations; Topics in Genetics: Metabolic Pathways, Mutant Analysis, Complementation Tests, Regulation of Transcription, and the Lac Operon. Both lectures and laboratories. Sequence with BI 221Z, BI 222Z.
Requisites: Prereq: BI 222Z; CH 223Z or CH 226H.
Additional Information:
Science Area

BI 221Z. Principles of Biology I: Cells. 5 Credits.
Explores fundamental biological concepts and theories about the cellular and molecular basis of life including cell structure and function, metabolism, genetic basis of inheritance and how information flows from DNA to proteins, with a focus on the iterative process of science. Intended for science majors.
Requisites: Prereq: one from CH 111, CH 113, CH 114, CH 221Z, CH 224H.
Equivalent to: BI 211
Additional Information:
Science Area

BI 222Z. Principles of Biology II: Organisms. 5 Credits.
Explores fundamental biological concepts and theories about the structure and function of diverse organisms (including plants and animals), evolution and development, transformation of energy and matter, and body systems at a multicellular organismal level. Intended for science majors.
Requisites: Prereq: BI 221Z.
Equivalent to: BI 212
Additional Information:
Science Area

BI 223Z. Principles of Biology III: Ecology and Evolution. 5 Credits.
Explores the unity and diversity of life through evolutionary mechanisms and relationships, and adaptation to the environment. Examines population, community, and ecosystem ecology. Intended for science majors.
Requisites: Prereq: BI 221Z.
Equivalent to: BI 213
Additional Information:
Science Area

BI 281H. Accelerated Biology I: Cells, Biochemistry and Physiology. 6 Credits.
Focuses on the cellular structures and chemical reactions that allow cells to grow, to transform energy, and to communicate. Lectures, laboratories. Sequence with BI 282H, BI 283H.
Requisites: Prereq: CH 223Z or CH 226H.
Additional Information:
Science Area

BI 282H. Accelerated Biology II: Genetics and Molecular Biology. 6 Credits.
How living organisms store, replicate, and transmit their genetic information, and how this information directs the activities of the cell and organism. Lectures, laboratories. Sequence with BI 281H, BI 283H.
Requisites: Prereq: BI 281H.
Additional Information:
Science Area

BI 283H. Accelerated Biology III: Evolution, Diversity and Ecology. 6 Credits.
The genetic basis and ecological context of evolutionary change leading to an examination of the generation and major patterns of biodiversity. Lectures, laboratories, field trips. Sequence with BI 281H, BI 282H.
Requisites: Prereq: BI 282H.
Additional Information:
Science Area

BI 307. Forest Biology. 4 Credits.
Structure and function of forested ecosystems emphasizing the Pacific Northwest. Interactions among trees, microorganisms, and animals; disturbance and recovery; forest management. Lectures, laboratories, field trips.
Requisites: Prereq: BI 223Z or BI 283H.
Additional Information:
Science Area

BI 320. Molecular Genetics. 4 Credits.
Molecular mechanisms regulating control of gene expression. Topics include chromosome structure, transcription and processing of RNA, control of transcription, translational control, and genetic rearrangement. Lectures, discussions.
Requisites: Prereq: BI 214 or BI 282H.

BI 322. Cell Biology. 4 Credits.
Eukaryotic cell nuclear structure and exchange, protein trafficking, endocytosis, chaperones, cytoskeletal functions, intercellular junctions, extracellular materials, signaling, cell division mechanics and controls, aging and death. Lectures, discussions.
Requisites: Prereq: BI 214 or BI 282H; CH 331 recommended.

BI 326. Immunology and Infectious Disease. 4 Credits.
In this course we will explore the principles of immune system function as well as how microorganisms avoid the immune system to cause infectious disease. Topics include innate and adaptive immunity, cells of the immune system, vaccines, antibiotics, and immune-based therapies.
Requisites: Prereq: BI 214 or BI 282H.

BI 328. Developmental Biology. 4 Credits.
Topics include genetic regulation, nucleocytoplasmic interactions, organogenesis, morphogenesis, pattern formation, cell differentiation, and neoplasia. Lectures, laboratories.
Requisites: Prereq: BI 214 or BI 282H.

BI 330. Microbiology. 3 Credits.
Biology of bacteria: photosynthetic, heterotrophic, and others. Cell structure and function, metabolism including anaerobic and O2-producing photosynthesis, nitrogen fixation, species interactions, and role in major geochemical cycles. Lectures.
Requisites: Prereq: BI 214 or BI 282H.

BI 331. Microbiology Laboratory. 3 Credits.
Microbial diversity through laboratory projects involving enrichments, culture isolations, and partial characterizations. Two scheduled laboratories and one scheduled lecture per week; additional unscheduled time required. Laboratories.
Requisites: Prereq: BI 214 or BI 282H; pre- or coreq: BI 330.

BI 353. Sensory Physiology. 4 Credits.
Introduction to physiology of the senses: cellular physiology of peripheral receptors through the computational mechanisms that are ultimately related to perception. Lectures, discussions.
Requisites: Prereq: BI 214 or BI 282H.

BI 356. Animal Physiology. 5 Credits.
Neurophysiology, endocrinology, muscle contraction, and homeostatic mechanisms of circulation, respiration, metabolism, ionic regulation, and excretion in mammals; comparison with those in other animals. Lectures, laboratories.
Requisites: Prereq: BI 214 or BI 281H.

BI 357. Marine Biology. 4 Credits.
Ecology and physiology of marine plants and animals. Comparisons of various marine habitats. Human influences on marine systems. Lectures, laboratories, field trips. Credits will be deducted for regression if BI 458 or BI 474 are taken first.
Requisites: Prereq: BI 223Z or BI 283H.
Additional Information:
Science Area

BI 358. Investigations in Medical Physiology. 4 Credits.
Human physiology with research and clinical medicine applications. Nervous system, addiction medicine, endocrinology, immunology, cardiology, digestion, nutrition, reproduction, infertility, pediatrics, and ophthalmology. Lectures, discussions, primary literature research. Human anatomy and physiology background preferred.
Requisites: Prereq: one from BI 214, BI 283H, HPHY 324.

BI 359. Plant Biology. 4 Credits.
A detailed introduction of the unique features of the biology of land plants, including ecology, physiology, developmental genetics, and evolutionary biology. Lectures, discussions.
Requisites: Prereq: [BI 221Z, BI 222Z, BI 223Z] or [BI 281H, BI 282H, BI 283H].

BI 360. Neurobiology. 4 Credits.
Function of the nervous system from the single neuron to complex neural networks. Topics range from molecular and cellular neurobiological mechanisms to systems and behavioral analyses. Lectures, discussions.
Requisites: Prereq: BI 214 or BI 282H.

BI 370. Ecology. 5 Credits.
Relationship of organisms to their environment in space and time. Factors controlling the distribution and abundance of organisms, introductions to community systems, and ecosystems. Required fieldwork. Lectures, laboratories, field trips.
Requisites: Prereq: BI 223Z or BI 283H. Calculus or statistics recommended.

BI 374. Conservation Biology. 4 Credits.
Global patterns of biological diversity; major threats to biodiversity; application of ecology, evolution, genetics, and other areas to protect and maintain biodiversity. Lectures, discussions.
Requisites: Prereq: BI 223Z or BI 283H.

BI 380. Evolution. 4 Credits.
Origin and maintenance of genetic variability. Historical and geographic patterns of variation. Application of population genetics to understanding evolutionary processes; modes of speciation. Lectures, discussions.
Requisites: Prereq: college algebra and BI 223Z or BI 283H.

BI 390. Animal Behavior. 4 Credits.
How and why animals behave, and how animal behavior is studied. Mechanisms of behavior, behavioral ecology, and sociobiology. Lectures, discussions.
Requisites: Prereq: BI 223Z or BI 283H.

BI 399. Special Studies: [Topic]. 1-5 Credits.
Experimental course - topic varies.
Requisites: Prereq: [BI 222Z, BI 223Z, BI 214] or BI 283H.
Repeatable 99 times

BI 399L. Special Studies: [Topic]. 4 Credits.
Experimental course - topic varies.
Requisites: Prereq: [BI 222Z, BI 223Z, BI 214] or BI 283H.
Repeatable 99 times

BI 401. Research: [Topic]. 1-16 Credits.
Disciplined inquiry of a topic with varying techniques and assignments suited to the nature and conditions of the problem being investigated. Often pursued in relation to a dissertation or thesis.
Repeatable 99 times

BI 402. Supervised College Teaching. 1-6 Credits.
A student, under faculty supervision and sponsorship, accepts responsibility for teaching a university course.
Repeatable 8 times for a maximum of 9 credits

BI 403. Thesis. 1-12 Credits.
A written document resulting from study or research and submitted as a major requirement for a degree.
Repeatable 99 times

BI 404. Internship: [Topic]. 1-16 Credits.
Professional practice in an organization that integrates concepts studied at the university with career-related work experience.
Repeatable 99 times

BI 405. Reading and Conference: [Topic]. 1-16 Credits.
A particular selection of material read by a student and discussed in conference with a faculty member.
Repeatable 99 times

BI 406. Practicum: [Topic]. 1-12 Credits.
A series of clinical experiences under academic supervision designed to integrate theory and principles with practice.
Repeatable 99 times

BI 407. Seminar: [Topic]. 1-2 Credits.
A small group of students studying a subject with a faculty member. Although practices vary, students may do original research and exchange results through informal lectures, reports, and discussions.
Repeatable 99 times

BI 408. Workshop: [Topic]. 1-12 Credits.
Special laboratory training in research methods. A fee may be charged for supplies and materials that become the property of the student.
Repeatable 99 times

BI 409. Capstone. 1-12 Credits.
A culminating academic project that demonstrates a student's mastery of their field of study.
Repeatable 99 times

BI 410. Experimental Course: [Topic]. 1-16 Credits.
Experimental course - topic varies.
Requisites: Prereq: [BI 222Z, BI 223Z, BI 214] or BI 283H.
Repeatable 99 times

BI 410L. Experimental Course: [Topic]. 4 Credits.
Experimental course - topic varies.
Repeatable 99 times

BI 422. Protein Toxins in Cell Biology. 4 Credits.
Mechanisms used by protein toxins to kill other organisms and how they have been used as molecular scalpels to dissect pathways in cell and neurobiology. Lectures, discussions.
Requisites: Prereq: one from BI 322, BI 356, BI 360.

BI 423. Human Molecular Genetics. 4 Credits.
Advanced topics in genetics that relate to human development and disease. The human genome, sex determination, X chromosome inactivation, chromosomal abnormalities, trinucleotide repeat expansions, cancer. Lectures, discussions.
Requisites: Prereq: BI 320.

BI 424. Advanced Molecular Genetics. 4 Credits.
Structure and function of chromosomes with emphasis on unsolved genetic problems such as genomic imprinting, position effects, and gene silencing. Lectures, discussions.
Requisites: Prereq: BI 320.

BI 426. Genetics of Cancer. 4 Credits.
Genetic regulation of cancer. Topics include oncogenes and tumor suppressor genes, signal transduction pathways, genetic animal models, and rationale treatment design. Lectures, discussions.
Requisites: Prereq: BI 214 or BI 282H; BI 320 or BI 322.

BI 428. Developmental Genetics. 4 Credits.
Genetic regulation of development, including investigations of molecular mechanisms and studies of developmental mutants. Topics include molecular biology of eukaryotic chromosomes, genetic mosaics, and models of gene regulation. Lectures, discussions.
Requisites: Prereq: BI 320, BI 328.

BI 430. Analysis of Neural Data. 4 Credits.
This course will focus on developing basic tools and techniques from probability, statistics, and scientific computation that are useful in data analysis, applying these techniques to the analysis of neuroscience datasets.
Requisites: Prereq: MATH 246 or MATH 251Z.

BI 432. Mycology. 5 Credits.
Physiology, ecology, structure, and classification of fungi; emphasis on structural and physiological adaptations to saprophytic, parasitic, and symbiotic modes of existence. Lectures, laboratories.
Requisites: Prereq: BI 223Z or BI 283H.

BI 433. Bacterial-Host Interactions. 4 Credits.
Examines spectrum of interactions between bacteria and animals, from pathogenesis to symbiosis, focusing on the molecular and cellular bases of these interactions. Lectures, discussions.
Requisites: Prereq: one from BI 320, BI 322, BI 330.

BI 442. Systematic Botany. 5 Credits.
Principles of plant classification with emphasis on flowering plants, introduction to taxonomic theory and methods of biosystematics, collection and identification procedures, recognition of common families in native flora. Lectures, laboratories, field trips.
Requisites: Prereq: BI 223Z or BI 283H.

BI 448. Field Botany. 4 Credits.
Intensive study of the regional flora; ecology and native uses; sight recognition of prominent species; field characteristics of principal plant families; identification using dichotomous keys. Lectures, field trips. Offered summer session only.
Requisites: Prereq: BI 223Z or BI 283H.

BI 451. Invertebrate Zoology. 1-10 Credits.
Representative invertebrate groups with emphasis on marine forms; morphology, systematics, life history, and ecology. Lectures, laboratories, field trips. Offered at Oregon Institute of Marine Biology.
Requisites: Prereq: BI 223Z or BI 283H.

BI 454. Estuarine Biology. 5 Credits.
The biological and physical factors regulating abundance, distribution, production, and biodiversity within estuaries. Includes field trips to marshes, tidal flats and exploration of estuarine habitats. Offered at Oregon Institute of Marine Biology.
Requisites: Prereq: BI 223Z or BI 283H.

BI 455. Marine Birds and Mammals. 1-6 Credits.
Principles of morphology, physiology, evolution, life history, and systematics as demonstrated through study of birds and mammals of the Oregon coast. Comparison of the fauna from the open sea to coastal waters. Lectures, laboratory, field trips. Offered at Oregon Institute of Marine Biology.
Requisites: Prereq: BI 223Z or BI 283H.

BI 457. Marine Biology: [Topic]. 1-8 Credits.
Content varies. Topics include comparative embryology, environmental issues, biology of fishes, and other subjects related to marine biology. Lectures, laboratories, field trips. Offered at Oregon Institute of Marine Biology.
Requisites: Prereq: [BI 222Z, BI 223Z] or BI 283H.
Repeatable 99 times when topic changes

BI 458. Biological Oceanography. 5 Credits.
Examines patterns of biological productivity and controlling physical and chemical mechanisms in the various environments of the world's oceans. Lectures, laboratories, field trips. Offered at Oregon Institute of Marine Biology.
Requisites: Prereq: BI 223Z or BI 283H.

BI 461. Systems Neuroscience. 4 Credits.
Principles of organization of nervous systems with emphasis on vertebrate brain and spinal cord. Functional implications of synaptic organization and pattern of projections, and comparative aspects. Lectures, discussions.
Requisites: Prereq: BI 353 or BI 360.

BI 463. Cellular Neuroscience. 4 Credits.
Physiology of excitation, conduction, and synaptic transmission. Lectures, discussions.
Requisites: Prereq: BI 360.

BI 466. Developmental Neurobiology. 4 Credits.
Mechanisms underlying development of the nervous system. The genesis of nerve cells; differentiation of neurons; synaptogenesis and neuronal specificity; plasticity, regeneration, and degeneration of nervous tissue. Lectures, discussions.
Requisites: Prereq: BI 320, BI 328.

BI 471. Population Ecology. 4 Credits.
Theoretical, experimental and applied aspects of growth, structure, and regulation of natural populations; population estimation; demographic analysis; life-history theory. Lectures, discussions.
Requisites: Prereq: BI 223Z or BI 283H.

BI 472. Community Ecology. 4 Credits.
Quantitative and conceptual approaches to the study of biological communities. Biodiversity measurement. Effect of climate and climate change on ecosystem structure and function. Lectures, discussions.
Requisites: Prereq: BI 370.

BI 474. Marine Ecology. 1-8 Credits.
Factors that influence the distribution, abundance, and diversity of marine organisms. Field emphasis on local intertidal and shallow-water communities. Offered at Oregon Institute of Marine Biology.
Requisites: Prereq: BI 223Z or BI 283H.

BI 484. Molecular Evolution. 4 Credits.
General description of patterns of molecular variation within and between species, underlying mechanisms, and methods of analysis.
Requisites: Prereq: BI 320 or BI 380.

BI 488. Evolutionary Processes. 4 Credits.
Critical discussion of the ecological and evolutionary genetic processes associated with adaptation in natural populations; draws from topics in population, quantitative, and molecular genetics, molecular evolution, and statistics.
Requisites: Prereq: BI 380.

BI 497M. Deterministic Dynamical Modeling in Biology. 4 Credits.
This course covers deterministic dynamical models in biology, i.e., models that describe the behavior of a biological system over time as a result of internal feedback loops and external forcings. The focus will be on differential equations, discrete-time models and related computational (programming) tools. Multilisted with MATH 497M.
Requisites: Prereq: One from MATH 242, MATH 247, MATH 252Z, MATH 320; one from STAT 243Z, DSCI 345M, MATH 345M, MATH 461, MATH 467.
Equivalent to: MATH 497M

BI 499M. Stochastic Dynamical Modeling in Biology. 4 Credits.
This course covers stochastic dynamical models in biology, i.e., mathematical models that describe the behavior of non-deterministic biological systems as a result of internal feedback loops, external forcings and random processes. Topics include stochastic iterative maps, Markov chains, vector autoregression models, and time series analysis. Multilisted with MATH 499M.
Requisites: Prereq: One from MATH 242, MATH 247, MATH 252Z, MATH 320; one from STAT 243Z, DSCI 345M, MATH 345M, MATH 461, MATH 467. Basic programming skills recommended.
Equivalent to: MATH 499M

BI 503. Thesis. 1-16 Credits.
A written document resulting from study or research and submitted as a major requirement for a degree.
Repeatable 99 times

BI 507. Seminar: [Topic]. 1-2 Credits.
A small group of students studying a subject with a faculty member. Although practices vary, students may do original research and exchange results through informal lectures, reports, and discussions.
Repeatable 99 times

BI 508. Workshop: [Topic]. 1-12 Credits.
An intensive experience, limited in scope and time, in which a group of students focus on skills development rather than content mastery.
Repeatable 99 times

BI 510. Experimental Course: [Topic]. 1-16 Credits.
Experimental course - topic varies.
Repeatable 99 times

BI 510L. Experimental Course: [Topic]. 4 Credits.
Experimental course - topic varies.
Repeatable 99 times

BI 522. Protein Toxins in Cell Biology. 4 Credits.
Mechanisms used by protein toxins to kill other organisms and how they have been used as molecular scalpels to dissect pathways in cell and neurobiology. Lectures, discussions.

BI 523. Human Molecular Genetics. 4 Credits.
Advanced topics in genetics that relate to human development and disease. The human genome, sex determination, X chromosome inactivation, chromosomal abnormalities, trinucleotide repeat expansions, cancer. Lectures, discussions.

BI 524. Advanced Molecular Genetics. 4 Credits.
Structure and function of chromosomes with emphasis on unsolved genetic problems such as genomic imprinting, position effects, and gene silencing. Lectures, discussions.

BI 526. Genetics of Cancer. 4 Credits.
Genetic regulation of cancer. Topics include oncogenes and tumor suppressor genes, signal transduction pathways, genetic animal models, and rationale treatment design. Lectures, discussions.

BI 528. Developmental Genetics. 4 Credits.
Genetic regulation of development, including investigations of molecular mechanisms and studies of developmental mutants. Topics include molecular biology of eukaryotic chromosomes, genetic mosaics, and models of gene regulation. Lectures, discussions.

BI 530. Analysis of Neural Data. 4 Credits.
This course will focus on developing basic tools and techniques from probability, statistics, and scientific computation that are useful in data analysis, applying these techniques to the analysis of neuroscience datasets.

BI 532. Mycology. 5 Credits.
Physiology, ecology, structure, and classification of fungi; emphasis on structural and physiological adaptations to saprophytic, parasitic, and symbiotic modes of existence. Lectures, laboratories.

BI 533. Bacterial-Host Interactions. 4 Credits.
Examines spectrum of interactions between bacteria and animals, from pathogenesis to symbiosis, focusing on the molecular and cellular bases of these interactions. Lectures, discussions.

BI 542. Systematic Botany. 5 Credits.
Principles of plant classification with emphasis on flowering plants, introduction to taxonomic theory and methods of biosystematics, collection and identification procedures, recognition of common families in native flora. Lectures, laboratories, field trips.

BI 548. Field Botany. 4 Credits.
Intensive study of the regional flora; ecology and native uses; sight recognition of prominent species; field characteristics of principal plant families; identification using dichotomous keys. Lectures, field trips. Offered summer session only.

BI 551. Invertebrate Zoology. 1-10 Credits.
Representative invertebrate groups with emphasis on marine forms; morphology, systematics, life history, and ecology. Lectures, laboratories, field trips. Offered at Oregon Institute of Marine Biology.

BI 554. Estuarine Biology. 5 Credits.
The biological and physical factors regulating abundance, distribution, production, and biodiversity within estuaries. Includes field trips to marshes, tidal flats and exploration of estuarine habitats. Offered at Oregon Institute of Marine Biology.

BI 555. Marine Birds and Mammals. 1-6 Credits.
Principles of morphology, physiology, evolution, life history, and systematics as demonstrated through study of birds and mammals of the Oregon coast. Comparison of the fauna from the open sea to coastal waters. Lectures, laboratory, field trips. Offered at Oregon Institute of Marine Biology.

BI 557. Marine Biology: [Topic]. 1-8 Credits.
Content varies. Topics include comparative embryology, environmental issues, biology of fishes, and other subjects related to marine biology. Lectures, laboratories, field trips. Offered at Oregon Institute of Marine Biology.
Repeatable 99 times when topic changes

BI 558. Biological Oceanography. 5 Credits.
Examines patterns of biological productivity and controlling physical and chemical mechanisms in the various environments of the world's oceans. Lectures, laboratories, field trips. Offered at Oregon Institute of Marine Biology.

BI 561. Systems Neuroscience. 4 Credits.
Principles of organization of nervous systems with emphasis on vertebrate brain and spinal cord. Functional implications of synaptic organization and pattern of projections, and comparative aspects. Lectures, discussions.

BI 563. Cellular Neuroscience. 4 Credits.
Physiology of excitation, conduction, and synaptic transmission. Lectures, discussions.

BI 566. Developmental Neurobiology. 4 Credits.
Mechanisms underlying development of the nervous system. The genesis of nerve cells; differentiation of neurons; synaptogenesis and neuronal specificity; plasticity, regeneration, and degeneration of nervous tissue. Lectures, discussions.

BI 571. Population Ecology. 4 Credits.
Theoretical, experimental and applied aspects of growth, structure, and regulation of natural populations; population estimation; demographic analysis; life-history theory. Lectures, discussions.

BI 572. Community Ecology. 4 Credits.
Quantitative and conceptual approaches to the study of biological communities. Biodiversity measurement. Effect of climate and climate change on ecosystem structure and function. Lectures, discussions.

BI 574. Marine Ecology. 1-8 Credits.
Factors that influence the distribution, abundance, and diversity of marine organisms. Field emphasis on local intertidal and shallow-water communities. Offered at Oregon Institute of Marine Biology.

BI 584. Molecular Evolution. 4 Credits.
General description of patterns of molecular variation within and between species, underlying mechanisms, and methods of analysis.

BI 588. Evolutionary Processes. 4 Credits.
Critical discussion of the ecological and evolutionary genetic processes associated with adaptation in natural populations; draws from topics in population, quantitative, and molecular genetics, molecular evolution, and statistics.

BI 597M. Deterministic Dynamical Modeling in Biology. 4 Credits.
This course covers deterministic dynamical models in biology, i.e., models that describe the behavior of a biological system over time as a result of internal feedback loops and external forcings. The focus will be on differential equations, discrete-time models and related computational (programming) tools. Multilisted with MATH 597M.

BI 599M. Stochastic Dynamical Modeling in Biology. 4 Credits.
This course covers stochastic dynamical models in biology, i.e., mathematical models that describe the behavior of non-deterministic biological systems as a result of internal feedback loops, external forcings and random processes. Topics include stochastic iterative maps, Markov chains, vector autoregression models, and time series analysis. Multilisted with MATH 599M.

BI 601. Research: [Topic]. 1-16 Credits.
Disciplined inquiry of a topic with varying techniques and assignments suited to the nature and conditions of the problem being investigated. Often pursued in relation to a dissertation or thesis.
Repeatable 99 times

BI 603. Dissertation. 1-16 Credits.
A written document resulting from study or research and submitted as a major requirement for a degree.
Repeatable 99 times

BI 604. Internship: [Topic]. 1-16 Credits.
Professional practice in an organization that integrates concepts studied at the university with career-related work experience.
Repeatable 99 times

BI 605. Reading and Conference: [Topic]. 1-16 Credits.
A particular selection of material read by a student and discussed in conference with a faculty member.
Repeatable 99 times

BI 606. Practicum: [Topic]. 1-16 Credits.
A series of clinical experiences under academic supervision designed to integrate theory and principles with practice.
Repeatable 99 times

BI 607. Seminar: [Topic]. 1-3 Credits.
Topics may include neurobiology, developmental biology, ecology colloquium, genetics, molecular biology, and neuroscience.
Repeatable 99 times

BI 608. Workshop: [Topic]. 1-16 Credits.
An intensive experience, limited in scope and time, in which a group of students focus on skills development rather than content mastery.
Repeatable 99 times

BI 609. Capstone. 1-12 Credits.
A culminating academic project that demonstrates a student's mastery of their field of study.
Repeatable 99 times

BI 610. Experimental Course: [Topic]. 1-5 Credits.
Experimental course - topic varies.
Repeatable 99 times

BI 610L. Experimental Course: [Topic]. 1-2 Credits.
Experimental course - topic varies.
Repeatable 99 times

BI 620. Molecular Genetics. 4 Credits.
Use of modern genetic techniques to analyze gene function. Illustrates the use of model organisms including yeast, worms, flies, and mice. Covers forward genetics (function-driven gene discovery) and reverse genetics.

BI 621. Computational Methods in Genomic Analysis. 4 Credits.
An introduction to Unix shell, Python, and R programming skills for analysis of biological data sets, specifically focusing on high-throughput sequencing data.

BI 622. Genomics Techniques. 4 Credits.
Students will be introduced to various genomics laboratory techniques, as well as trained in oral and written scientific communication.

BI 623. Advanced Topics in Genomics Analysis. 4 Credits.
Exposure to a variety of topics in genomics analysis including phylogenetics, transcriptome assembly, transcript quantification, and microbial community analysis.

BI 624. Genomics Research Lab. 4 Credits.
Group research on high-throughput sequencing data.

BI 625. Advanced Genomic Analysis. 4 Credits.
Group research on high-throughput sequencing data and special topics in genomics analysis.
Requisites: Prereq: BI 624.