### BIOSOOGY (BI)

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<th>Course Code</th>
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<td>BI-103</td>
<td>The Human Animal</td>
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<td>BI-114</td>
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<td>BI-116</td>
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<td>BI-120</td>
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<td>BI-125</td>
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<td>BI-130</td>
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<td>BI-140</td>
<td>Introduction to Organismal Biology</td>
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<td>BI-141</td>
<td>Intro to Cellular and Molecular Biology</td>
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<tr>
<td>BI-161</td>
<td>Human Anatomy and Physiology I</td>
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**Description:**
- **BI-101 Concepts of Biology:** Unifying principles in biology; diversity and evolution of plant and animal life at cellular and organismic levels. Three lecture hours and a two-hour laboratory per week. Fall and Spring and every year. 4 Credits
- **BI-103 The Human Animal**: A general survey of the structure and function of human body systems from the biochemical and cellular basis of life to evolution of the human body and the organization of organs and organ systems, including the biological basis of selected disease states. Every year. 3 Credits
- **BI-104 The Human Animal Laboratory**: This course is the lab to accompany The Human Animal, a general survey of the structure and function of human body systems from the biochemical and cellular basis of life to evolution of the human body and the organization of organs and organ systems, including the biological basis of selected disease states. Every year. 3 Credits
- **BI-111 Social Biology**: This course considers the interface between current biological technologies and the social, cultural, legal, and moral postures of modern man. Every year. 1 Credit
- **BI-112 Diseases and Mankind**: Diseases of ancient and modern man; the impact on history, religion, science, art and philosophy. Spring only and every year. 3 Credits
- **BI-114 Plants and Human Affairs**: Man’s dependence upon plants and their influence on civilization and its art, religions, literature, folklore, medicine, and human behavior. Spring only and every 2-3 years. 3 Credits
- **BI-116 Animal Biology**: Survey of animal kingdom with emphasis on animal diversity, morphology, life histories, ecological evolutionary relations. No credit for Biology major. Three lecture hours and two laboratory hours per week. Fall and Spring. 4 Credits
- **BI-117 Humans and the Environment**: A survey of Anthropologic environmental impacts and the underlying mechanisms involved. Three lecture hours and three laboratory hours per week. Other or on demand. 4 Credits
- **BI-118 Dinosaurs**: A survey of dinosaurs; their evolution, anatomy, diversity and impact on evolutionary biology. Discussions of the changing views of dinosaurs in the media and public consciousness. Three hours lecture and two hours lab. Every 2-3 years. 4 Credits
- **BI-119 Biology of Sex**: An introduction to the natural history of sex, to answer the question of why does sex exist, and discuss topics of variation, sexual dimorphism, sexual selection, inter- and intra-sexual conflict, mating systems in plants and invertebrate animals. Will also focus on mating systems among vertebrate animals: monogamy, polygamy (including polygyny, polyandry, and polygynandry), sexual reproduction in mammals, and among primates. Will cover courtship behavior in sexual animals with emphasis in marine invertebrates, arthropods, and primates (including humans). Course will conclude with a discussion of the genetics of parent-offspring conflict in placental mammals. Other or on demand and every year. 3 Credits
- **BI-120 Darwinian Revolution**: An interdisciplinary perspective on the philosophical, religious, and social impacts of Darwin’s theory of evolution by the process of natural selection. [Formerly BI370.] Every 2-3 years. 3 Credits
- **BI-125 Women in Science**: Examines issues related to gender in science and technology. Includes historical and recent contributions to science made by women. Other or on demand and every 2-3 years. 3 Credits
- **BI-130 Field Biology**: Study-Abroad Field Biology course for non-Biology majors. Course explores the intersection of human activities and environmental preservation, with a basic introduction to topics in organismal biology, biodiversity and biogeography. Spring only and every year. 4 Credits
- **BI-140 Introduction to Organismal Biology**: Evolution, ecology, anatomy, physiology and diversity of organisms. Three hours lecture and three hours lab each week. Intended for STEM Majors. Every year. 4 Credits
- **BI-141 Intro to Cellular and Molecular Biology**: Cellular and molecular concepts in biology. Emphasis on the structure and varied functions of the cell. Three lecture hours and three laboratory hours per week. Intended for STEM Majors. Every year. 4 Credits
- **BI-161 Human Anatomy and Physiology I**: Considers human cellular biology, tissues, integumentary, nervous, endocrine, skeletal, muscular systems. Three hours of lecture and a three-hour laboratory per week. Every year. 4 Credits
BI-162 Human Anatomy and Physiology II  
**LASC Categories:** LAB, NSP  
**Prerequisites:** BI-161.  
Considers digestive, respiratory, cardiovascular, urinary, immune and lymphatic systems; water and electrolyte balance, reproduction and embryology. Three lecture hours and three laboratory hours per week. Spring only and every year. 4 Credits

**BI-193 First Year Seminar Biology**  
**LASC Categories:** FYS  
Introductory level course covering topics of special interest to first year students. Offered only as a First Year Seminar.  
Every year. 3 Credits

**BI-199 Selected Topics: Biological Sciences**  
Each topic is a lecture and/or a laboratory course in a selected area of the biological sciences presented by a departmental instructor. Topics will be announced in advance.  
Every 2-3 years. 1-4 Credits

**BI-200 Human Biology**  
**LASC Categories:** NLL  
**Prerequisites:** BI-140 and BI-141 or PB-200.  
A systemic approach to the study of human biology. The course will emphasize structure/function relationships and homestatic mechanisms. Three hour lecture and three hour lab.  
4 Credits

**BI-202 Principles of Ecology**  
**LASC Categories:** NLL, WAC  
**Prerequisites:** BI-140, EN-102, MA-150 or MA-180, or MA-190, or MA-200.  
Basic ecological theory relating to organism-environment interactions; population dynamics, and ecosystems. Three hours of lecture and a three-hour laboratory per week.  
Every year. 4 Credits

**BI-203 Genetics**  
**LASC Categories:** NLL, QAC  
**Prerequisites:** BI-141. Must have a minimum Accuplacer score of 3. Introductory genetics with examples of human inheritance and recent developments in genetic engineering. Three hours of lecture and a three-hour laboratory per week.  
Spring only and every year. 4 Credits

**BI-204 Microbiology**  
**LASC Categories:** NLL  
**Prerequisites:** BI-141 and CH-121.  
The cytology, metabolism, and genetics of bacteria. Immune responses and control of microorganisms are stressed. Three lectures and a three-hour laboratory per week. (Prerequisites: Introductory chemistry and biology courses)  
Fall and Spring and every year. 4 Credits

**BI-205 Research Techniques and Experimental Design**  
**Prerequisites:** BI-141, and MA-150.  
Investigations in experimental design and research methodologies required for the Honors program in Biology (or Biotechnology).  
Fall only and every year. 2 Credits

**BI-206 Medical Microbiology**  
**LASC Categories:** NSP, LAB  
**Prerequisites:** BI-161 and either CH-112 or CH-120 and CH-121.  
A study of growth and control of pathogenic microorganisms with emphasis on infectious disease transmission, immune responses, prevention and treatment. Three lecture and three laboratory hours per week.  
4 Credits

**BI-207 Public Health Microbiology**  
**Prerequisites:** BI-161 and CH-112.  
Growth and control of pathogenic microorganisms with emphasis on infectious disease transmission, immune responses, prevention and treatment for Public Health Majors.  
Every year. 3 Credits

**BI-211 Pre-Medical Seminar: Preparing for a Career in Medicine**  
A seminar that will introduce pre-medical, pre-dental, and pre-veterinary students to the the requirements for admission to graduate programs in these areas. Students will develop personal plans for working toward these requirements, will interact with a variety of healthcare professionals to gain knowledge about different careers and determine which is the best fit for them, and will discuss current ethical and policy issues related to healthcare.  
Fall only and every year. 1 Credit

**BI-215 Neuroscience**  
**LASC Categories:** NLL  
**Prerequisites:** BI-161 and BI-162  
Structural and functional organization of the human nervous system with a focus on clinical applications. Three lecture hours and three laboratory hours per week.  
Every year. 4 Credits

**BI-240 Research Experience**  
Lab and/or field based research on a specific research topic under the supervision of a faculty member.  
1-6 Credits

**BI-266 Biology of Aging**  
Considers characteristics of the aging process utilizing the newest theories based upon dynamics, function and metabolic regulations, disease and the acceleration of the aging process. [Formerly BI351.]  
Other or on demand. 3 Credits

**BI-271 Basic Kinesiology**  
**LASC Categories:** NSP  
**Prerequisites:** BI-161.  
Structure and function of human skeletal muscles in relation to motion and general body mechanics under normal and stress conditions.  
Every year. 3 Credits

**BI-301 Topics in Invertebrate Zoology**  
**LASC Categories:** NLL  
**Prerequisites:** BI-140 and BI-202.  
Considers anatomy, taxonomy (including selected articles of the international code of zoological nomenclature), natural history, and evolutionary relationships of selected invertebrate phyla. Three hours of lecture and a three-hour laboratory per week.  
Spring only and every 2-3 years. 4 Credits
BI-303 Parasitology
LASC Categories: NLL
Prerequisites: BI-140 and either BI-200 or BI-161 and BI-162.
Basic concepts in symbiology, life cycles, epidemiology, disease development, control and prevention of selected human parasites. Three hours of lecture and a three-hour laboratory per week.
Every 2-3 years. 4 Credits

BI-304 Comparative Vertebrate Anatomy
LASC Categories: NLL
Prerequisites: BI-140 and either BI-200 or BI-161 and BI-162.
Considers prochordate and chordate taxonomy and phylogeny; systematic morphological comparison of representative chordates to establish homology, analogy, and evolution. Three lecture hours and a three-hour laboratory per week.
Every 2-3 years. 4 Credits

BI-306 Developmental Biology
LASC Categories: NLL
Prerequisites: BI-141 and BI-203.
Study of developmental patterns, celluar differentiation and cell interactions resulting in cellular diversity, organization, and perpetuation of the germ line. Three lecture hours and three laboratory hours per week.
Fall and Spring and every year. 4 Credits

BI-313 Histology
LASC Categories: NLL
Prerequisites: BI-141 and either BI-200 or BI-161 and BI-162.
The structure and function of animal tissues. Each student is required to prepare tissues using histological methods. Three hours of lecture and a three-hour laboratory per week.
Spring only and every 2-3 years. 4 Credits

BI-315 Comparative Neurobiology
LASC Categories: NLL
Prerequisites: BI-161 and BI-162 or BI-200 or PB-200.
Structural and functional organization of the central and peripheral nervous system. Principles of normal and abnormal transmission, integration, and storage of information in neuronal pathways. Three hours of lecture and a three-hour laboratory per week.
Spring only and every year. 4 Credits

BI-321 Comparative Physiology
LASC Categories: NLL
Prerequisites: BI-140, BI-141, and either BI-200 or BI-161 and BI-162.
A comparison of select physiological functions of different animal taxa with mammals used as a reference. Three lecture hours and a three-hour laboratory per week.
Every 2-3 years. 4 Credits

BI-324 Endocrinology
LASC Categories: NLL
Prerequisites: BI-140, BI-141, and BI-200 or BI-161/162
The role of endocrine glands in the normal integration of animals; mechanisms of hormone action, function, and interrelationships. Three hours of lecture and a three-hour laboratory per week.
Spring only and every 2-3 years. 4 Credits

BI-331 Marine Biology
LASC Categories: NLL
Prerequisites: BI-140 and BI-202.
Considers the marine environment, its flora and fauna, distribution and production of plankton-nekton-benthos, zoogeography, bioeconomic factors and potential. Three lecture hours and a three-hour laboratory per week.
Every 2-3 years. 4 Credits

BI-333 Topics in Vertebrate Zoology
LASC Categories: NLL
Prerequisites: BI-140 and BI-202.
Life histories, adaptations, distribution, systematics, and economic importance of selected vertebrates taxa. Each semester will focus on a particular taxon. Three hours of lecture and a three-hour laboratory per week.
Every 2-3 years. 4 Credits

BI-334 Wildlife Biology
Prerequisites: BI-140 and BI-202.
Theory and Practice of wildlife management. Considers procedures for collection and analysis of field and laboratory data on vertebrate game populations useful to wildlife biologists. Three hours of lecture and a three-hour laboratory per week.
Every 2-3 years. 4 Credits

BI-340 Plant Sciences
LASC Categories: NLL
Prerequisites: BI-140 and BI-202.
Fundamentals of plant processes: nutrition, metabolism, growth, development and responses. Three hours of lecture and a three-hour laboratory per week.
Other or on demand. 4 Credits

BI-342 Plant Physiology
Prerequisites: BI-141 and BI-204.
Includes study of nutrient cycling, relations between plants, animals, and microbes, ecology of polluted soils and soil biotechnology. Three lecture hours and three laboratory hours per week.
Fall and Spring and every year. 4 Credits

BI-344 Soil Biology
LASC Categories: NLL
Prerequisites: BI-140, BI-141, BI-204, CH-120, and CH-121.
Includes study of nutrient cycling, relations between plants, animals, and microbes, ecology of polluted soils and soil biotechnology. Three lecture hours and three laboratory hours per week.
Fall and Spring and every year. 4 Credits

BI-352 Symbiosis and Evolution
LASC Categories: NLL
Prerequisites: BI-140, BI-141, and BI-204.
Origin and nature of microbial life, evolution of multicellular organisms and the central role played by biological symbioses. Lecture and laboratory.
Fall and Spring. 4 Credits

BI-360 Animal Behavior
LASC Categories: NLL
Prerequisites: BI-202 or PB-200.
Survey of ethology and behavioral ecology from an historical and evolutionary perspective. Laboratory involves observation, recording and analysis of animal behavior. Three lecture hours and three laboratory hours per week.
4 Credits
BI-371 Advanced Topics in Cell and Molecular Biology  
LASC Categories: NLL  
Prerequisites: BI-141 and BI-203 or BI/CH-410.  
Examination of current topics in cell and molecular biology, including mechanisms that regulate gene expression and protein function, organization of cellular components into functional pathways, and modern experimental techniques.  
Other or on demand and every 2-3 years. 4 Credits

BI-372 Immuno-ology  
LASC Categories: NLL  
Prerequisites: BI-141 and BI-204  
Introduction to cellular defense mechanisms in health and disease; antigen-antibody reactions, human immune responses. Three lecture hours and three laboratory hours per week.  
Spring only and every 2-3 years. 4 Credits

BI-375 Virology  
LASC Categories: NLL  
Prerequisites: BI-141, and BI-204.  
Physical structure and replication schemes of viruses; role of viruses in human disease, research and commercial applications. Three lecture hours and three laboratory hours per week.  
Fall and Spring and every year. 4 Credits

BI-380 Biodiversity and Conservation Biology  
LASC Categories: LAB  
Prerequisites: BI-140, BI-141, BI-202, and BI-203.  
A theoretical and quantitative approach to species, genetic, ecosystem and community diversity in the context of modern conservation biology principles. Three lecture hours and three laboratory hours per week.  
Other or on demand. 4 Credits

BI-398 Cancer Biology  
Prerequisites: BI-141 and BI-203  
Cellular and molecular basis of cancer, including cancer genetics, biochemical pathways related to cancer, and modern treatment approaches.  
4 Credits

BI-401 Selected Topics: Biological Sciences  
Each topic is a lecture and/or laboratory course in a selected area of the biological sciences presented by a departmental instructor and/or guest lecturers when appropriate. Topic to be announced in advance.  
Other or on demand. 1-4 Credits

BI-402 Independent Study: Biology  
Advanced semi-independent study (by qualified upper-level biology majors) of an approved biological problem. Faculty supervision required.  
(May not be used for major requirements.)  
Fall only and every year. 1-6 Credits

BI-403 Internship: Biology  
Intended for qualified, upper-level biology majors. Faculty advisor required.  
(May not be used for major requirements.)  
Fall and Spring and other or on demand. 1-6 Credits

BI-404 Biology Seminar  
LASC Categories: CAP  
Prerequisites: BI-202, BI-203, BI-204, BI-200 or BI-161 BI-162. Senior  
Standing also required  
Preparation and presentation of biological topics, chosen with the advice and consent of a faculty advisor.  
Fall and Spring and every year. 2 Credits

BI-408 Directed Study: Biology  
Directed study offers students, who because of unusual circumstances may be unable to register for a course when offered, the opportunity to complete an existing course with an established syllabus under the direction and with agreement from a faculty member.  
1-3 Credits

BI-410 Biochemistry I  
LASC Categories: NLL  
The chemistry of proteins, nucleic acids, carbohydrates, and lipids; enzymes, biological oxidations; and correlations in intermediary metabolism. Three hours of lecture and a three-hour laboratory per week.  
(Cross listed as CH410.)  
Every 2-3 years. 4 Credits

BI-411 Biochemistry II  
LASC Categories: NLL  
The generation and storage of metabolic energy; biosynthesis of macromolecular precursors, DNA, RNA, and protein; and biochemical regulation. Three hours of lecture and a three-hour laboratory per week.  
(Cross listed as CH411.)  
Every 2-3 years. 4 Credits

BI-430 Field Biology  
Study Abroad Field Biology course for Biology majors. Course explores the intersection of human activities and environmental preservation, with an in-depth discussion of topics in organismal biology, ecology, biodiversity and biogeography.  
Spring only and every year. 4 Credits

BI-440 Advanced Research Experience for Undergraduates  
Advanced lab and/or field research on a specific research topic under the supervision of a faculty member.  
Fall and Spring. 1-6 Credits

BI-451 Nuclear Instrumentation I  
Structure, functions, and interactions of particulate and non-particulate radiations with matter, detection, calibration, dosage, and statistical methods. Consent of NMT Coordinator.  
(Cross listed as PY 451.)  
Every year. 4 Credits

BI-452 Nuclear Instrumentation II  
Designed to further the skills of operating, calibrating and performing routine maintenance on scanners, gamma cameras, well counters, and liquid scintillation counters. Consent of NMT coordinator.  
(Cross listed as PY 452.)  
Spring only and every year. 4 Credits

BI-453 Radiopharmaceuticals  
Fundamental concepts of radiopharmaceutical production and use including basic radiochemistry. Consent of NMT coordinator.  
(Cross listed as PY 453.)  
Spring only and every year. 4 Credits

BI-454 NMT Clinical Practicum IV  
Upon completion of this practicum, students should be skilled in performing both routine and non-routine nuclear medicine examinations and laboratory procedures. Consent of NMT coordinator.  
(Formerly BI 456.)  
Every year. 8 Credits

BI-466 Clinical NMT II  
Case presentations using formulas, charts, tables, and calculations to arrive at examination parameters such as dose, number of counts, speed of instrument, etc. Consent of NMT instructor.  
(Cross listed as CH 466; formerly BI/CH 458.)  
Every year. 4 Credits