BIOLOGY (BI)

BI-221 Biology of Plants (4 credits)
The emphasis of this course is on the structure, development, physiology, and life cycles of plants. Woven throughout is the critical role plants play in basic science research especially in the rapidly developing fields of biotechnology and agribiology. In addition, the impact of plants on society is addressed in an in-depth presentation. The laboratory reinforces and clarifies theory presented in class.
Prerequisite(s): SC-120 & SC-120L completed

BI-222 Biology of Animals (3 credits)
Offered Fall Term in alternate years. This course provides an overview of the animal kingdom and an introduction to the areas of biology that concern animals, such as ecology, evolution, behavior, taxonomy, anatomy, and physiology. The laboratory emphasizes experimental design, evaluation of data, and problem solving.
Prerequisite(s): SC-120 & SC-120L completed. Concurrent with BI-222L.

BI-222L Biology of Animals Lab (1 credit)
Offered Fall Term in alternate years. Biology of Animals lab
Prerequisite(s): Concurrent with BI-222

BI-223 Natural History of North America (4 credits)
Using concepts from botany, zoology, earth science, ecology, and environmental science, students explore the diversity of living and non-living systems. Students undertake a meaning comparison of regions across North America. Specific emphasis will be placed on historical and humanistic understandings of water access as an exemplar of how these approaches inform scientific knowledge of place.
Prerequisite(s): SC-112 or SC-118 or SC-120 completed or permission of instructor.

BI-231 Human Anatomy & Physiology (3 credits)
In this course, the student learns how the different body systems work and how they are regulated to maintain a steady state within the body. She uses this knowledge to analyze and predict the body's response to stresses and to changes in the environment.
Prerequisite(s): SC-118 & SC-118L or SC-120 & SC-120L completed. CH-213, CH-221, CH-234 or CH-260 completed. Student must sign up for lecture and one lab. For MUY students: SC-118 & SC-118L or SC-120 & SC-120L & MU-262 completed., Take BI-231L

BI-231L Human Anatomy & Physiology Lab (1 credit)
Human Anatomy & Physiology lab taken currently with BI-231.
Prerequisite(s): BI-231 concurrently

BI-250 Laboratory Techniques (1 credit)

BI-251 Microbiology (3 credits)
The student focuses on analysis and problem solving to understand the microbial world and its multiple interactions with other organisms. This course is laboratory-focused, with the student examining the form, structure, metabolic activities, and growth patterns of selected microbes. Using student-generated data and research skills, she identifies an unknown organism, designing and implementing an independent investigative learning experience. She studies the contributions of microbiology to basic science and its interface with current societal issues.
Prerequisite(s): SC-120 completed; CH-213 or any 200-level CH course completed. Students must sign up for lecture and one lab. Other information: Summer 2018: no class May 28, Take BI-251L concurrently

BI-251L Microbiology Lab (1 credit)
Microbiology Lab taken currently with BI-251.
Prerequisite(s): Concurrent registration in BI-251; SC-120 &-120L completed. CH-213 or any 200-level CH course and lab. Other Information Summer 2018: no class May 28, Take BI-251

BI-297 Independent Study (2-4 credits)
Under the approval and direction of a faculty member, independent study is available to students.

BI-301 Adv Topics in Biology: (3 credits)
In this advanced course in microbiology, the student focuses on the broad field of microbial ecology. She studies how the microscopic world has such a significant impact on every aspect of the life and well-being of our planet. She studies soil biota, biogeochemical cycles, water quality, energy sources, and bioremediation. A subfocus of the course is quality assurance and prime resources used as a standard. The course design necessitates that the student use advanced analytical and problem-solving skills.
Prerequisite(s): BI-251 completed.

BI-302 Virology (3 credits)
The student applies qualitative and quantitative analytic and problem-solving skills to understand the diverse ways that viruses invade and inhabit living cells. She explores properties of virus structure, molecular mechanisms of virus reproduction, pathways of virus infection, pathological effects on infected cells, and the impact of viruses on ecological systems. The class surveys a broad range of viruses from multiple perspectives, including problems of human disease.
Prerequisite(s): BI-325 or BI-361 completed. If you have any other BI 300-level course completed, contact the instructor for approval to take this class.

BI-303 Examining Evolution (3 credits)
The student analyzes the functioning and integration of a biological system or related biological systems. She builds and evaluates conceptual models. She becomes familiar with specific current technologies associated with the area of study. She may design and conduct experiments and evaluate the resultant data.
Prerequisite(s): SC-120 completed

BI-304 Developmental Biology (3 credits)
The student analyzes the functioning and integration of a biological system or related biological systems. She builds and evaluates conceptual models. She becomes familiar with specific current technologies associated with the area of study. She may design and conduct experiments and evaluate the resultant data.
Prerequisite(s): BI-251 & BI-251L completed BI-231 & BI-231L completed

BI-305 Biology of Aging (3 credits)
The student analyzes the functioning and integration of a biological systems. She builds and evaluates conceptual models. She becomes familiar with specific current technologies associated with the area of study. She may design and conduct experiments and evaluate the resultant data.

BI-325 Cellular Biology (3 credits)
The student studies the complexity of the eukaryotic cell by examining and integrating separate organelle functions and their molecular control, including protein production and sorting and cell signaling involved in cell behaviors (e.g., cell division, migration). Throughout the course she compares a normal functioning cell with an abnormal cancer cell. In the laboratory she learns basic cell biology techniques, including eukaryotic cell staining and growth, and quantitative and qualitative analysis of molecular interactions.
Prerequisite(s): BI-251, MT-123 or MT-148 or MT-152 or MP-2 completed; One of the following completed: CH-213, CH-221, CH 228, CH-234 or CH-260 completed., Take BI-325L

BI-325L Cellular Biology Lab (1 credit)
Cellular biology lab taken concurrently with BI-325.
Prerequisite(s): Take BI-325

BI-328 Biochemistry (4 credits)
The student analyzes the structure and function of biomolecules with an emphasis on proteins and particularly enzymes. She also studies the function, regulation, and integration of metabolic pathways. In her laboratory work, she learns some basic biochemistry techniques and employs them in determining the molecular weight of a protein, purifying an enzyme, and conducting enzyme kinetic studies.
Prerequisite(s): CH-221, CH-221L completed. MT-123 or MP 2 or higher completed.

BI-328L Biochemistry Lab (0 credits)
Biochemistry Lab
Prerequisite(s): Concurrent with BI-328.

BI-338 Physiological Mechanisms Disease (4 credits)
This course deals primarily with the physiological bases of illness and the treatments used. Starting from the principles of physiology, the student learns to understand disease in terms of the damage it causes to the body, the body's attempt to compensate, and methods used to help the body compensate. She uses and interprets the technical terminology associated with disease and its treatment.
Prerequisite(s): BI-231 and BI-231L completed.

BI-341 Ecology (4 credits)
Course Offered Fall Term only. The student examines relationships of organisms to their environment and studies interrelations among organisms. Her extensive fieldwork and long-term research assist her in analyzing complex environments. Throughout the course, she develops her data analysis and communication skills. She analyzes, formualtes, and critiques model environmental impact statements using her ecological tools.
Prerequisite(s): MT-123 or MT-152 or MP-2 completed; SC-120 & SC-120L completed; BI-221 or BI-222 & BI-222L or BI-223 or BI-301 completed.

BI-361 Genetics Lecture (3 credits)
Lecture & Lab offered Fall term only. The student applies qualitative and quantitative analytic skills to understand how biological traits are determined in an individual, and how they are inherited from generation to generation. She explores the nature of genes as abstract pieces of information, as physical elements of the cell's chromosomes, and as chemical sequences of a DNA modecule. The class surveys the diversity of genetic systems among living things, with special attention to problems of human heredity.
Prerequisite(s): QL-156 completed. BI-251 & one other BI course at 200 or 300-level completed. BI & BIM Majors register for BI-361L concurrently. BI Supports that are non-Nursing register for BI-361L concurrently.

BI-361L Genetics Lab (1 credit)
Offered in Fall Term only. In this course, which is required for majors in the biological sciences, the student applies theoretical concepts of heredity to solve problems in genetics that are demonstrated by living organisms in the laboratory. She applies analytic and problem-solving techniques from prerequisite courses to a series of integrated experiments that together demonstrate the fundamental principles of genetics in simple plant and animal systems.
Prerequisite(s): Take concurrent with BI-361.

BI-374 BI Assessment in Effective Citizenship (1 credit)
This assessment takes the form of volunteer research for a community organization. The student works with a community organization to develop a project that will use her biology research skills and benefit the community. She analyzes the organization to develop criteria for an effective product, uses appropriate research skills, and reports her findings in a manner appropriate to the audience.
Prerequisite(s): Effective Citizenship Level 3 completed.

BI-395 Biochemistry of Micronutrients (3 credits)
The goal of this course is to provide an increased understanding of the biochemical and physiological mechanisms involved in micronutrient action and metabolism and the regulation of micronutrient homeostasis in the body. This course will provide an in-depth understanding of the basis of the body's need for fat-soluble vitamins, water-soluble vitamins, and minerals and the molecular functions of these nutrients. The student will increase conceptual knowledge concerning the application of laboratory techniques that are commonly used in modern biological science research through analysis of primary research papers in a journal club format. Offered in spring terms every other year
Prerequisite(s): SC-120 completed; CH-213 or CH-221 completed; Analysis Level 3 completed.

BI-397 Independent Study (2 credits)
The student selects a topic in biology related to her career goals and, under the direction of a Biology Department faculty member, investigates that topic in depth.

BI-399 Formal Introduction to Advanced Work (0 credits)
The Advanced-Level Event marks a significant accomplishment for each student as she proceeds into the work of her major department. When a department determines that a student is ready for advanced work within a discipline, the student is invited to participate in a ceremony that is both a celebration and an explanation of future requirements of the major and support areas. She registers for this experience at a point determined by her major department: for most majors the registration is connected to the taking of a particular course. Students and faculty gather for an afternoon during Mid-semester Assessment Days. Following a general program, students meet in departmental sessions with their faculty to discuss advanced outcomes, department courses, advising procedures, and so on.
Prerequisite(s): One of the following courses completed: BI-221, BI-222 BI-231, BI-251, BI-325.

BI-425 Molecular Biology (4 credits)
Offered Spring Term alternate years only. In this course, the student integrates and applies knowledge from a breadth of fields in biology, chemistry, and physics to the analysis of molecular mechanisms and control of nucleic acids in living organisms. The course focuses on the theoretical and technical mechanisms of nucleic acid (DNA and RNA) function, including replication and gene expression. There is a strong emphasis on current laboratory techniques for manipulating the genome, and laboratory work is closely integrated with the lecture/discussion component.
Prerequisite(s): BI-325 or BI-361 completed. Concurrent registration in BI-425L. Offered Spring Term only.,

BI-425L Molecular Biology Lab (0 credits)
Offered Spring Term only. A Molecular Biology lab taken concurrently with BI-425.
Prerequisite(s): Concurrent registration with BI-425. Offered Spring Term only, Take BI-425

BI-441 Animal Behavior (4 credits)
Offered Spring Term in alternate years. The student investigates mechanisms underlying patterns of animal behavior and their ecological, physiological, and evolutionary basis. She identifies differences and commonalities between the fields of comparative psychology, behavorial ecology, and neurophysiology in their approach to examining animal behavior. She focuses on the selective value of various behaviors and uses behavior models to describe and interpret behavior. She designs, conducts, and evaluates behavioral experiments. She works extensively with the primary literature of animal behavior.
Prerequisite(s): BI-222 or BI-231 or BI-341 or BSC-255 or PSY-345 or PSY-350. Analysis and Problem Solving Level 4 completed

BI-443 Chronobiology (3 credits)
The student concentrates on the temporal dimension of the rythmic patterns observed throughout the living world. She is introduced to several theories detailing the biological basis of rythmic patterns, and she explores and evaluates these theories. She analyzes selected research studies of human rythmic patterns, their manipulations, and the interpretation of data that support these changes, incorporating insights gained from gene mutants that affect rythmic events.
Prerequisite(s): BI-231 and BI-251 completed.

BI-452 Immunology (3 credits)
Offered Spring Term only. The student examines the complex mechanisms, theories, and models regarding how the living system responds to what is foreign to itself and how at times it responds negatively to itself. Areas of study include antigen-antibody specificity and reactions, autoimmunity, and diagnostic testing. The student also analyzes medical case studies that deal with immunological health problems.
Prerequisite(s): BI-325 or BI-361 and one other 300 level BI course completed. Offered in Spring Term only.

BI-483 Advanced Internship Seminar (2-4 credits)
The student applies her analytic and problem-solving abilities in researching a specific problem in an industrial, health-related, or other appropriate facility off campus.
Prerequisite(s): Departmental consent; confer with advisor. Pre- placement workshop required. See Internship Registration Procedures page for workshop schedule and required internship procedures.

BI-491 Senior Environmental Seminar (3 credits)
In this course the student examines current environmental issues selected by the class. She integrates what she has learned across the curriculum to investigate the scientific, political, economic, ethical, legal, and historical aspects of issues that affect the environment, and she develops and evaluates different plans of action. She also reflects extensively on her educational experiences and completes a culminating self assessment of her undergraduate work.
Prerequisite(s): BI Majors only. Senior standing. Two 300-level BI courses completed.

BI-497 Independent Study (2 credits)
Under the approval and direction of a faculty member, independent study is available to students.

BI-698 Biology Course (1 credit)
This course will offer different topics in Biology.