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

BI-221L Biology of Plants Lab (1 credit)
Biology of Plants lab.
Prerequisite(s): BI-221

BI-222 Biology of Animals (4 credits)
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

BI-222L Biology of Animals Lab (1 credit)
Biology of Animals lab
Prerequisite(s): BI-222

BI-230 Anatomy & Physiology I with Laboratory (3 credits)
This is a dual enrollment course that is offered by Kettle Moraine High School Health Science program (KMSD) in partnership with Alverno College. The course runs throughout the entire academic year, divided into two sections: the first in the fall semester (BI-230) and the second in the spring semester (BI-230B), and it is expected that KMSD students will visit Alverno College for selected lab activities. Students will develop an understanding of the structures and functions of the human body and its systems. The course has two components: classroom/lecture and laboratory. The lecture component of the course is primarily focused on developing and using problem solving and analysis skills to investigate concepts of normal human physiology, while the laboratory component addresses anatomy topics. Activities such as cadaver dissections and working on anatomical models will be performed throughout the course to enhance learning. Students will use online resources such as videos and diagrams to interconnect physiology and anatomy of various body systems. Upon successful completion of the course students will receive a transcript for 3 college credits awarded by Alverno College.

BI-230B Anatomy & Physiology I with Laboratory (0 credits)
This is a dual enrollment course that is offered by Kettle Moraine High School Health Science program (KMSD) in partnership with Alverno College. The course runs throughout the entire academic year, divided into two sections: the first in the fall semester (BI-230) and the second in the spring semester (BI-230B), and it is expected that KMSD students will visit Alverno College for selected lab activities. Students will develop an understanding of the structures and functions of the human body and its systems. The course has two components: classroom/lecture and laboratory. The lecture component of the course is primarily focused on developing and using problem solving and analysis skills to investigate concepts of normal human physiology, while the laboratory component addresses anatomy topics. Activities such as cadaver dissections and working on anatomical models will be performed throughout the course to enhance learning. Students will use online resources such as videos and diagrams to interconnect physiology and anatomy of various body systems. Upon successful completion of the course students will receive a transcript for 3 college credits awarded by Alverno College.

BI-231H 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. Students use this knowledge to analyze and predict the body's response to stresses and to changes in the environment. Course open to Prerequisite DEMSN students only.

BI-231LH Human Anatomy & Physiology Lab (1 credit)
Human Anatomy & Physiology lab taken currently with BI 231. Course open to Prerequisite DEMSN students only.

BI-233 Human Anatomy & Physiology 1 (3 credits)
In this course, students learn the structure and function of the primary organ systems. Students learn how these organ systems interact to understand the emergent properties found within humans. In addition, students learn basic physiology associated with these organ systems and how these systems respond to stressors for maintaining homeostasis. Students develop their intermediate analysis skill by predicting the appropriate physiological response to daily environmental stressors.
Prerequisite(s): SC-112+L, SC-118+L, or SC-120L, BI-233L

BI-233L Human Anatomy & Physiology 1 Lab (1 credit)
Human Anatomy & Physiology lab taken currently with BI-233.
Prerequisite(s): BI-233 previous or concurrent

BI-240 Anatomy & Physiology II With Laboratory (3 credits)

BI-240B A & P II With Laboratory (0 credits)
This dual enrollment course offered by Kettle Moraine High School Health Science program (KMSD) in partnership with Alverno College. This is a two-semester, Human Anatomy and Physiology II course that includes lecture and laboratory component. In this course students will focus their investigation on normal human anatomy and physiology that is central to clinical applications. The lecture component of the course will primarily focus on developing and using problem solving and analysis skills to investigate concepts of normal human physiology, while the laboratory component will address anatomy topics. This course will foster students' problem solving and analysis skills and apply them to investigate concepts of normal human anatomy and physiology. Students will use multiple resources including textbooks online resources cadaver dissections and working on coloring books and anatomical models to achieve and demonstrate a comprehensive understanding of the human anatomy and physiology. Throughout the course, students will advance their social interaction and communication skills by working in small collaborative groups on case studies and class assignments which is integral to fostering academic success and strong leadership skills.

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, students identify an unknown organism, designing and implementing an independent investigative learning experience. Students study 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., Must register concurrently for BI-251L.

BI-251H 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, students identify an unknown organism, designing and implementing an independent investigative learning experience. The student studies the contributions of microbiology to basic science and its interface with current societal issues. Course open to Prerequisite DEMSN students only.

BI-251L Microbiology Lab (1 credit)
Microbiology Lab taken currently with BI-251.
Prerequisite(s): SC-120 & SC-120L completed. CH-213 or any 200-level CH course and lab completed., Must register concurrently for BI-251.

BI-251LH Microbiology Lab (1 credit)
Microbiology Lab taken currently with BI-251. Course open to Prerequisite DEMSN students only.

BI-297 Independent Study (2-4 credits)
Under the approval and direction of a faculty member, independent study is available to students.
Prerequisite(s): Spring 2021: Biological constrains on animal behavior

BI-306 BI Prin on Cosmetic Science 1 (3 credits)

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 students compare a normal functioning cell with an abnormal cancer cell. In the laboratory, the student learns basic cell biology techniques, including eukaryotic cell staining and growth, and quantitative and qualitative analysis of molecular interactions.
Prerequisite(s): BI-251+L, BI-325L, One CH course 200 level or above, MT-123, MT-148, or MT-152

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

BI-328 Biochemistry (4 credits)
The student analyzes the structure and function of biomolecules with an emphasis on proteins and particularly enzymes. The student also studies the function, regulation, and integration of metabolic pathways. In laboratory work, the student 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; MT-123 or MP 2 or higher. Students register for lecture and lab., BI-328L.

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

BI-333 Human Anatomy & Physiology II (3 credits)
In this course, students will learn how to apply the communication and analysis frameworks in the context of normal human anatomy and physiology. They will study the control of organ systems and how these systems maintain homeostasis. Students will also be introduced to basic organ system dysfunction resulting in disease. The main emphasis of this course will be on the interconnectedness and feedback regulation within the entire human body. Students use this knowledge to predict how the human body adapts, responds, and counteracts diseases and changes in the environment.
Prerequisite(s): SC-119, SC-120

BI-338 Pathophysiology (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. Students use and interpret the technical terminology associated with disease and its treatment.
Prerequisite(s): Take BI-233+L, Take BI-333

BI-338C 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. Students use and interpret the technical terminology associated with disease and its treatment. Admission to the DEMSN program. Current CPR certification and all program health requirements met.

BI-341 Ecology (4 credits)
The student examines relationships of organisms to their environment and studies interrelations among organisms. Extensive fieldwork and long-term research assist the student in analyzing complex environments. Throughout the course, students develop data analysis and communication skills. Students analyze, formulate, and critique model environmental impact statements using ecological tools.
Prerequisite(s): SC-112+L, SC-118+L, or SC-120+L, MT-123, MT-148, or MT-152

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. Students explore the nature of genes as abstract pieces of information, as physical elements of the cell's chromosomes, and as chemical sequences of a DNA molecule. The class surveys the diversity of genetic systems among living things, with special attention to problems of human heredity.
Prerequisite(s): QL-156, MT-256, or BSC-257 or consent of instructor., Take BI-251+L, BI-361L previous or concurrent

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. Students apply 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): 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. Students work with a community organization to develop a project that will use their biology research skills and benefit the community. Students analyze the organization to develop criteria for an effective product, use appropriate research skills, and report 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 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, CH-213 or CH-221. Analysis Level 3 completed.

BI-397 Independent Study (4.00 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 as each student proceeds into the work of the 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. The student registers for this experience at a point determined by the 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): BI-221, BI-222, BI 231, BI-251 0r 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+L or BI-361+L preveiously completed

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. The student identifies differences and commonalities between the fields of comparative psychology, behavioral ecology, and neurophysiology in their approach to examining animal behavior. The student focuses on the selective value of various behaviors and uses behavior models to describe and interpret behavior. Students design, conduct, and evaluate behavioral experiments. The student works extensively with the primary literature of animal behavior.
Prerequisite(s): 1 course from BI, BSC, CH, or PSY 200 level or above

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): Take two BI or CH courses at or above level 200

BI-491 Senior Environmental Seminar (3 credits)
In this course the student examines current environmental issues selected by the class. Students integrate what they learn across the curriculum to investigate the scientific, political, economic, ethical, legal, and historical aspects of issues that affect the environment, and develop and evaluate different plans of action. Students also reflect extensively on their educational experiences and complete a culminating self assessment of undergraduate work.
Prerequisite(s): BI Majors only. Senior standing. Two 300-level BI courses completed, or instructor consent.

BI-497 Independent Study (1-3 credits)
Under the approval and direction of a faculty member, independent study is available to students.

BI-497A Independent Study (1 credit)

BI-497B Independent Study (0 credits)
Biology Independent Study

BI-497C Independent Study (0 credits)

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