

BIOLOGY (BIO)

BIO-101 Introductory Biology I (4 credits)

The lecture topics included are origins of life, prebiotic chemistry; and surveys of the major plant, invertebrate and vertebrate phyla. The course also includes evolutionary principles governing taxonomic criteria and the physiology of movement of d and water in plants. A three-hour lab accompanies the above lecture. Intended for biology majors and minors.

Corequisite(s): Take BIO-101L

BIO-101L Intro Bio Lab I (0 credits)

A three-hour lab accompanies the above lecture. Intended for biology majors and minors.

Course Types: Scientific Reasoning

Corequisite(s): Take BIO-101

BIO-102 Introductory Biology II (4 credits)

The lecture topics include a survey of the cell, its chemical constituents and its organelles, energy metabolism and photosynthesis. Introductory classic and molecular genetics is also covered. A three-hour lab accompanies the above lecture. Intended for biology majors and minors.

Corequisite(s): Take BIO-102L

BIO-102L Intro Bio Lab II (0 credits)

A three-hour lab accompanies the above lecture. Intended for biology majors and minors.

Corequisite(s): Take BIO-102

BIO-105 Human Biology (4 credits)

This course surveys the function of the human body systems in health and disease and includes topics of current interest, which may include diet and nutrition, treatments for infertility, infectious diseases and vaccines, and the affects of drugs on the nervous system. This course consists of three hours of lecture and three hours of laboratory per week. The lab exercises are designed to complement the lecture topics, and concurrent registration in both lecture and three-hour laboratory are required. This course is not eligible for elective credit in the major but is a required course in the psychology major.

Course Types: Scientific Reasoning

Corequisite(s): Take BIO-105L

BIO-105L Human Biology Lab (0 credits)

The lab exercises are designed to complement the lecture topics, and three-hour laboratory are required.

Corequisite(s): Take BIO-105

BIO-107 Human Anatomy & Physiology I (3 credits)

This is a study of the structural and functional relationships of the human organism, emphasizing cells and tissues, the integument, skeletal system, muscular system, nervous system and sense organs. This course consists of three lectures a week.

Corequisite(s): Take BIO-107L; Take one semester of college chemistry.

BIO-107L Human Anatomy & Physiology Laboratory (1 credits)

This course accompanies BIO-107. This course consists of three hours of lab a week.

Corequisite(s): Take BIO-107

BIO-108 Human Anatomy & Physiology II (3 credits)

This continuation of BIO 107 emphasizes the digestive system, respiratory system, blood, cardiovascular system, urinary system, reproductive systems, endocrine system, human genetics and development. This course consists of three lectures a week.

Prerequisite(s): Take BIO-107 BIO-107L

Corequisite(s): Take BIO-108L

BIO-108L Human Anatomy & Physiology II Lab (1 credits)

This course accompanies BIO-108. This course consists of three hours of lab a week.

Corequisite(s): Take BIO-108

BIO-110 Biology Seminar 1 (1 credits)

This biology seminar presents student with service experiences and the opportunity to dissect, reflect, and write on ethical topics relevant to science. It also orients students to sciences and future careers, connecting them with professionals in disparate fields of science (e.g. health-science professionals, lab technicians, researchers, academics, science sales reps, industry workers).

Course Types: Civic Engagement; Community Service; Ethical Reasoning and Act; Natural Sciences; Service Learning

BIO-117 Drugs and Disease (3 credits)

What exactly is a heart attack? Why does aspirin health prevent strokes? Why are anti-depressants associated with suicide? This basic course will answer these questions while providing an overview of common disease states and the drugs used to treat them. Disease states of the major organ systems will be covered as well as the most commonly prescribed drugs in America. Prerequisite: None: however, basic knowledge in biology is recommended; not eligible for elective credit in the major.

Course Types: Oral Communication

BIO-123 Art and Anatomy (3 credits)

Figure drawing is taught with special attention to underlying anatomy. Nuances of surface anatomy, human proportion, and anatomical terminology are considered in an artistic context. Historical paintings and sculpture are used for identifying the subtleties of the human figure.

Foundational drawing techniques are demonstrated using anatomical models, prosected cadavers, live models and special dissections as subjects. This course could serve as a general science or humanities elective for the core.

BIO-123L Art and Medicine in Florence, Italy Lab (1 credits)

This is a D'Youville College faculty-led study abroad experience. Our faculty together with the faculty of the University of Florence and their partnering institutions including experts from the Museum La Specola, the Institute for the History of Healthcare, the Academy of Fine Arts, the botanical gardens, the Foundation for Photo/Art in Hospitals, the Italian Army, the Museum Galileo Galilei, the medical library and the anthropological museum. Materials and course information will be collected and submitted to the Division of Math and Natural Sciences whose faculty will use this information to determine course grades. This course can be used as a lab course as part of the core curriculum. This study abroad experience in Florence, Italy has duration of two weeks. The course consists of approximately 20 sessions featuring expert-led laboratory-type experiences at medical libraries, botanical gardens, art museums/galleries/institutions, military medicine facilities, hospitals and scientific laboratories. Emphasis is on healthcare and science using evidentiary artifacts and masterpieces in Florence, Italy dating from before the Renaissance to present times. Much of the time will be with hands-on inspection and instruction with instruments and medical models, or in activities.

BIO-145 The Process of Scientific Discovery (3 credits)

The process of scientific discovery relies on the use of the scientific method as the framework for scientific reasoning. This is an introductory course where students will learn the scientific method and its application. The application of the scientific method will be through the presentation of cases (ex. the hereditary basis for achondroplasia). Scientific reasoning will be assessed by presenting students with simple data (ex. a pedigree showing the pattern of a condition's inheritance in a family). Students will draw conclusions from this data to demonstrate their understanding and application of course content. This course is intended for non-science majors. It can be a free elective for science majors. There are no prerequisite course requirements.

Course Types: Foundational Gen Ed; Natural Sciences; Scientific Reasoning; Themed

BIO-189 Topics in Critical Inquiry (3 credits)

Critical inquiry is the process of gathering and evaluating information, ideas, and assumptions from multiple perspectives to produce well-reasoned analysis and understanding, and leading to new ideas, applications and questions. This course is intended to introduce new students to intellectual inquiry at the university by engaging them in in-depth study of a single topic utilizing a variety of perspectives and methods. The course emphasizes the essential role of critical and creative thinking to their lives as students, citizens, future professionals, and productive members of their communities.

Course Types: Critical Analysis; Topics; Thinking Process

Corequisite(s): Take BIO-189L

BIO-189L Topics in Critical Inquiry - Lab (1 credits)

Critical inquiry is the process of gathering and evaluating information, ideas, and assumptions from multiple perspectives to produce well-reasoned analysis and understanding, and leading to new ideas, applications and questions. This course is intended to introduce new students to intellectual inquiry at the university by engaging them in in-depth study of a single topic utilizing a variety of perspectives and methods. The course emphasizes the essential role of critical and creative thinking to their lives as students, citizens, future professionals, and productive members of their communities. The lab for the course is an interdisciplinary application lab, wherein students work in teams to demonstrate what they learned in the didactic portion of the course through the creation of a project, presentation, art object/installation, play, podcast, short film, co-authored reflection (debrief) on a simulation experience, etc. Faculty who design the didactic portion of the course together will design this portion as a 5-week experiential component of the course, which might include community partnerships or field trips. Students who take the course and lab will be invited to display their project results in a one-afternoon presentation at the end of each semester (to be arranged by college events personnel).

Course Types: Teamwork; Topics

Corequisite(s): Take BIO-189

BIO-201 The Biology of Survival: The Martian (3 credits)

This course emphasizes problem solving using the science fiction novel *The Martian* by Andy Weir. It highlights the problems needed to survive in a hostile environment (the biology of survival) and the problems that Mark Watney (the protagonist in *The Martian*) specifically overcomes to survive on Mars for 687 mission days until he is rescued.

Course Types: Foundational Gen Ed; Natural Sciences; Problem-Solving; Themed; Thinking Process

BIO-205 Biodiversity I, Microbes, Protists, and Plants (4 credits)

This course begins to introduce the breadth of non-living microbes (ex. viruses, prions, and viroids) with the diversity of living organisms both prokaryotic and eukaryotic (ex. bacteria, protists, and plants). Significant time will be dedicated to identifying their distinct traits (physiological or physical) as adaptations for survival and reproduction in their natural habitats.

Course Types: Natural Sciences

Prerequisite(s): Take BIO-101 BIO-101L BIO-102 BIO-102L

Corequisite(s): Take BIO-205L

BIO-205L Biodiversity I, Microbes, Protists, and Plants Lab (0 credits)

This course begins to introduce the breadth of non-living microbes (ex. viruses, prions, and viroids) with the diversity of living organisms both prokaryotic and eukaryotic (ex. bacteria, protists, and plants). Significant time will be dedicated to identifying their distinct traits (physiological or physical) as adaptations for survival and reproduction in their natural habitats.

Course Types: Natural Sciences

Prerequisite(s): Take BIO-101 BIO-101L BIO-102 BIO-102L

Corequisite(s): Take BIO-205

BIO-206 Biodiversity II (4 credits)

An understanding of the basic principles of biodiversity is important to understand the important ecological challenges we face today. In this course students will examine the diversity and evolution of animals and fungi as a continuation of the taxonomic groups presented in Biodiversity I. This will include an understanding of their ecological, economic, and medical importance to human populations. This course will also provide an introduction to the basic principles of biodiversity and conservation to achieve deeper knowledge on biodiversity and the services that ecosystem provide to human societies, the connection between biodiversity and ecosystem services, and how human societies depend on these services.

Course Types: Natural Sciences

Prerequisite(s): Take BIO-101 BIO-101L BIO-102 BIO-102L

Corequisite(s): Take BIO-206L

BIO-206L Biodiversity II Lab (0 credits)

An understanding of the basic principles of biodiversity is important to understand the important ecological challenges we face today. In this course students will examine the diversity and evolution of animals and fungi as a continuation of the taxonomic groups presented in Biodiversity I. This will include an understanding of their ecological, economic, and medical importance to human populations. This course will also provide an introduction to the basic principles of biodiversity and conservation to achieve deeper knowledge on biodiversity and the services that ecosystem provide to human societies, the connection between biodiversity and ecosystem services, and how human societies depend on these services.

Course Types: Natural Sciences

Prerequisite(s): Take BIO-101 BIO-101L BIO-102 BIO-102L

Corequisite(s): Take BIO-206

BIO-208 Microbiology (3 credits)

This course is an introduction to the morphology, physiology, ecology and replication modes of bacterial and eukaryote microorganisms as well as viruses. Pathogens associated with human disease are used to illustrate these general concepts. Methods used by microbes to resist antimicrobial drugs, transfer antimicrobial resistance and methods used to control the growth of microorganisms are also discussed. Emphasis is given to mechanisms of pathogenesis used by bacteria and viruses. The means used by humans to prevent or rid the body of microbial agents are also discussed. In the laboratory, students gain skills in sterile technique, stain procedures and biochemical tests used to characterize bacteria. Methods used to control microbial growths are also studied. The course consists of three hours of lecture and three hours of laboratory per week.

Prerequisite(s): Take (BIO-101, BIO-101L, BIO-102, BIO-102L) or (BIO-107, BIO-107L, BIO-108, BIO-108L); Take 2 semesters of college chemistry or take CHE-114.

Corequisite(s): Take BIO-208L

BIO-208L Microbiology Lab (1 credits)

This course consists of three hours of lab a week.

Corequisite(s): Take BIO-208

BIO-210 Modern Topics in Biology (3 credits)

This is an introduction to biological topics of general interest and practical value. Topics are drawn from areas such as basic biological principles, functioning of the human body, health problems and environmental issues. Students have a role in choosing topics and are actively involved in class presentations and discussions. This course consists of three lectures per week and is not eligible for elective credit in the major.

BIO-215 Environmental Science (3 credits)

This is an introduction to the principles of environmental science and considers how those principles can be applied to our understanding and solution of current environmental problems. The course consists of three lectures per week and is not eligible for elective credit in the major.

Corequisite(s): Take BIO-215L

BIO-215L Environmental Science Lab (1 credits)

This is field and lab work designed to provide direct experience while investigating the basis for environmental principles. Students are exposed to the monitoring of environmental problems. The course is three lab hours per week and is not eligible for elective credit in the major.

Corequisite(s): Take BIO-215

BIO-216 Marine Biology (3 credits)

This is an introduction to the life of the seas. It begins with basic information about the chemical, physical and geological nature of the oceans. All major marine communities are surveyed, including coastal zones and estuaries, coral reefs, the open ocean and the exotic communities of the deep sea. Extra attention is given to special topics of particular importance or interest. The final section concerns human interactions with the marine world and threats that they pose to it.

Prerequisite(s): Take BIO-101, BIO-101L, BIO-102, BIO-102L

BIO-217 Animal Handling (3 credits)

This course covers the fundamentals of domestic animal behavior, nutritional, physiology and welfare in relation to animal handling. Students will study how to assess welfare and how behavior plays an important role in mitigation and diagnosis of disease. This course is designed for majors and non-majors and will satisfy a WIP requirement, however biology majors wishing to use it toward their major electives must also take the accompanying laboratory BIO 217L as a co-requisite.

Course Types: Writing Intensive

Prerequisite(s): Take (BIO-101 BIO-101L BIO-102 BIO-102L) or (BIO-107 BIO-107L) or (BIO-105 BIO-105L) and achieve a minimum grade of B

BIO-217L Animal Handling Lab (1 credits)

This course covers the fundamentals of domestic animal behavior and welfare. Through hands-on experience with animals in the lab and off-site trips to farms, zoos and shelters to explore how to properly handle live animals. This course is required for Biology Majors taking the lecture course, Animal Handling BIO-217. A core assignment for this course is caring for the animals on their own and their written reflection of that experience. This experience can be used to apply for internships and jobs in the animal sciences. This course is designed for students who are interested in animals, and animal focused careers, such as Veterinarians, Veterinarian technicians, Zookeepers, Animal handlers and Animal research. For non- biology majors, the lab may be taken alone and has no pre-requisite.

Corequisite(s): Take BIO-217 - Required for Biology Majors wishing to use this course towards their Biology Electives.

BIO-218 Invertebrate Zoology (4 credits)

This is a survey of the major invertebrate groups with emphasis on their diverse patterns of form and function. Coverage of each group includes its distinguishing characteristics and patterns of adaptations for coping with the needs of life by following examples of selected species. Basic biological principles and special impacts on humans are discussed when appropriate. In the laboratory, live and preserved specimens from marine, freshwater and terrestrial habitats are used to explore aspects of anatomy, physiology and behavior. The course consists of three lectures and three hours of laboratory a week.

Prerequisite(s): Take BIO-101 BIO-101L BIO-102 BIO-102L

Corequisite(s): Take BIO-218L

BIO-218L Invertebrate Zoology Lab (0 credits)

Corequisite(s): Take BIO-218

BIO-220 Myology I (3 credits)

This course provides a comprehensive study of the anatomy and assessment of function of the musculoskeletal structures in a regional format. The fundamentals of posture, alignment and examination, scoliosis, innervation patterns, and articulations will be studied. The origins, insertions, actions, and range of motion of the head, face, cervical, thoracic, and lumbar regions will be covered in this course.

Course Types: Natural Sciences

Prerequisite(s): Take BIO-107 BIO-107L BIO-108 BIO-108L

BIO-220L Myology I Lab (1 credits)

This course provides a comprehensive assessment of the regional muscular anatomical function and structure. The fundamentals of planes of movement, postural examination, assessment of alignment, and joint motions, innervation patterns, and articulations will be practiced. The synergists of the vertebral column, origins, insertions, actions, palpation, strength testing, and kinesiology of the head, face, cervical, thoracic, and lumbar regions will also be practiced in this course.

Course Types: Natural Sciences

Prerequisite(s): Take BIO-107 BIO-107L BIO-108 BIO-108L

Corequisite(s): Take BIO-220

BIO-221 Myology II (3 credits)

This course provides a comprehensive study of the anatomy and assessment of function of the musculoskeletal structures in a regional format. The fundamentals of muscular examination, innervation patterns, regional pain syndromes and articulations will be studied. The origins, insertions, actions range of motion of the abdomen and upper and lower extremity regions will be covered in this course.

Course Types: Natural Sciences

Prerequisite(s): Take BIO-220 BIO-220L

Corequisite(s): Take BIO-221L

BIO-221L Myology II Lab (1 credits)

This course provides a comprehensive assessment of the regional muscular function and structure. The fundamentals of regional topographical anatomy, joint motions, innervation patterns, and articulations will be practiced. Origins, insertions, actions, palpation, strength testing, and kinesiology of the abdominal, upper and lower extremities will be covered in this course.

Course Types: Natural Sciences

Prerequisite(s): Take BIO-220 BIO-220L

Corequisite(s): Take BIO-221

BIO-224 Pathology I (3 credits)

This course utilizes a fundamental conceptual approach to the study of diseases by exploring an overview of regional anatomy in health, disease, and therapeutic applications for healing the body during the disease process. The regions and systems covered in Pathology I include integumentary, musculoskeletal, nervous, circulatory, and immune systems conditions.

Course Types: Natural Sciences

Prerequisite(s): Take BIO-107 BIO-107L BIO-108 BIO-108L

BIO-225 Pathology II (3 credits)

This course utilizes a fundamental conceptual approach to the study of diseases by exploring an overview of regional anatomy in health, disease, and therapeutic applications for healing the body during the disease process. The regions and systems covered in Pathology II include, respiratory, digestive, endocrine, urinary, reproductive, and principles of cancer.

Course Types: Natural Sciences

Prerequisite(s): Take BIO-224

BIO-226 Neuroanatomy and Neurophysiology (4 credits)

This introductory course in human neurology and neurophysiology begins with the development and study of the cells that comprise nerve tissue and the physiology of the nerve impulse, including the role of neurotransmitters. The anatomical regions of the nervous system will be explored in depth, including development and anatomy of the spinal cord, spinal meninges, spinal nerves, spinal nerve plexuses, cranial nerves, terminal nerve pathways, and points of entrapment. The brain stem, cerebral cortex, special senses, and autonomic nervous system control and physiologic functions will complete the course.

Course Types: Natural Sciences

Prerequisite(s): Take BIO-107 BIO-107L

BIO-229 Ecology (4 credits)

This is a broad introduction to the basic concepts of ecology as they pertain to population, evolutionary processes, communities and ecosystems. Several current environmental problems are explored in the light of these concepts. Laboratory includes a mix of lab and field exercises designed to put lecture topics into practice. The course consists of three lectures and three laboratory hours a week.

Prerequisite(s): Take BIO-101 BIO-101L BIO-102 BIO-102L

Corequisite(s): Take BIO-229L

BIO-229L Ecology Lab (0 credits)

The course consists of three laboratory hours a week.

Corequisite(s): Take BIO-229

BIO-230 Foundations of Environmental Science (4 credits)

This course examines the interactions between the physical, chemical, and biological components of the environment and human populations. Topics to be included but not limited to the course are 1)the impact of human activities on air and water quality, 2)the use of natural resources including renewable and non-renewable energy sources, minerals and biological resources,3)conservation and biodiversity, and 4)land use including wildlife, fisheries and forest management, recreational uses and agriculture. This course requires a weekly 3 hour lecture and a 3 hour laboratory. The laboratory portion of the course will examine present practices and problems associated with environmental issues through field trips and laboratory/field experiments.

Prerequisite(s): Take BIO-101 BIO-101L; Take (BIO-102 BIO-102L) or (BIO-303 BIO-303L)

Corequisite(s): Take BIO-230L

BIO-230L Foundations of Environmental Science (0 credits)

This course examines the interactions between the physical, chemical, and biological components of the environment and human populations. Topics to be included but not limited to the course are 1)the impact of human activities on air and water quality, 2)the use of natural resources including renewable and non-renewable energy sources, minerals and biological resources,3)conservation and biodiversity, and 4)land use including wildlife, fisheries and forest management, recreational uses and agriculture. This course requires a weekly 3 hour lecture and a 3 hour laboratory. The laboratory portion of the course will examine present practices and problems associated with environmental issues through field trips and laboratory/field experiments.

Prerequisite(s): Take BIO-101 BIO-101L; Take (BIO-102 BIO-102L) or (BIO-303 BIO-303L)

Corequisite(s): Take BIO-230

BIO-231 Environmental Geology (4 credits)

This course and required laboratory is designed to be an introduction to Environmental Geology through a broad survey of topics which are interconnected by society and geologic processes. These topics include Earth systems, geosphere materials, plate tectonics, earthquakes, volcanoes, rivers and flooding, land stability, coastal change, water, soil, mineral and energy resources, climate changes and human environmental impact. Laboratory experiences will be related to the course objectives and will include offsite experiences.

Prerequisite(s): Take BIO-101 BIO-101L; Take (BIO-102 BIO-102L) or (BIO-303 BIO-303L)

Corequisite(s): Take BIO-231L

BIO-231L Environmental Geology Lab (0 credits)

This course and required laboratory is designed to be an introduction to Environmental Geology through a broad survey of topics which are interconnected by society and geologic processes. These topics include Earth systems, geosphere materials, plate tectonics, earthquakes, volcanoes, rivers and flooding, land stability, coastal change, water, soil, mineral and energy resources, climate changes and human environmental impact. Laboratory experiences will be related to the course objectives and will include offsite experiences.

Prerequisite(s): Take BIO-101 BIO-101L; Take (BIO-102 BIO-102L) or (BIO-303 BIO-303L)

Corequisite(s): Take BIO-231

BIO-242 Evolution (3 credits)

Evolution is the single most unifying theory in the biological sciences. This course traces the beginnings of Darwinian-Wallace evolution by natural selection and places this theory in historical perspective. Current evidences of evolution are given and explained and evolution at the gene level is discussed. The emphasis of the course is on biological and biochemical adaptations to changing environments. Some limited treatment of population genetics is included.

Prerequisite(s): Take BIO-101 BIO-101L BIO-102 BIO-102L

BIO-284 The Great Lakes:Natural History, Ecology and Conservation (3 credits)

This course will incorporate ecological and biological history of the Great Lakes Region and the impact that humans have had, and will have, as region continues to change. "Five immense lakes lie at the heart of North America. They cover an area of nearly 95,000 square miles and hold more than 5,500 cubic miles of water. Together they comprise the world's largest freshwater system, containing 95 percent of the continent's fresh water - and one-fifth of the planet's total supply. Home to 40 million people, the Great Lakes' drainage basin is the hub of industry and agriculture in North America."- W. Grady. This course will explore the flora, fauna, geology and human history of the great lakes, and conservation efforts, past and present.

Course Types: Foundational Gen Ed; Natural Sciences; Quantitative Literacy; Scientific Reasoning; Themed

BIO-285 How to Tame a Fox and Build a Dog (3 credits)

How to Tame a Fox and Build a Dog: Evolution of Dogs is a non-major's course that will take a deep dive into the famous Siberian Fox Farm studies of the 1950's, the geopolitical impacts, and insights into the evolution of man's best friend, dogs. This course is designed to teach students the interacting elements of politics and science, and their impacts on our understanding of the natural world through journal and news articles, and the book "How to Tame a Fox, And Build a Dog".

Course Types: Foundational Gen Ed; Global Learning; Natural Sciences; Themed; Culture Comp/Glob Society

BIO-286 Evolutionary Biology of Sex (3 credits)

This course explores the evolutionary biology of sex from Darwin's theory of sexual selection to why sexual reproduction exists. Using an uproarious and authoritative natural history in the form of letters to, and answers from, a preeminent expert in all creation.

Course Types: Creative Thinking; Foundational Gen Ed; Natural Sciences; Themed

BIO-289 Special Topics (1-6 credits)

This course presents an opportunity to study a selected topic in the biological sciences. Topics can originate with faculty or students.

BIO-300 Biology Seminar 2 (1 credits)

The Biology Seminar 2 presents students with teaching and mentoring experiences while building their scientific literacy. Students will explore research opportunities and write a mini-review, foundational for the research required by their capstone project.

Course Types: Community Service; Ethical Reasoning and Act; Natural Sciences; Service Learning

Prerequisite(s): Take BIO-110

BIO-302 Genetics (4 credits)

This is an examination of the principles of classic and molecular genetics. Topics discussed include Mendel's contribution, linkage, gene mapping, structure and function of DNA and RNA; bacterial and viral genetics, gene function, mutation, regulation of gene activity, recombinant DNA technology and quantitative and population genetics. Laboratory experiments with *Drosophila*, bacteria and fungi demonstrate principles discussed in the lecture. The course consists of three lectures and three hours of lab a week.

Course Types: Problem-Solving; Teamwork

Prerequisite(s): Take BIO-101 BIO-101L BIO-102 BIO-102L. Must have a minimum of a 2.2 GPA.

Corequisite(s): Take BIO-302L

BIO-302L Genetics Lab (0 credits)

The course consists of three lab hours a week.

Course Types: Scientific Reasoning

Corequisite(s): Take BIO-302

BIO-303 Biochemistry (3 credits)

This one-semester course emphasizes structure/function relationships among the components responsible for the biochemical functions of life. Topics include proteins, enzymes, carbohydrates, bioenergetics, metabolism (catabolism and anabolism), lipids, membranes, nucleic acids, biotechnology, biochemical methods, vitamins and nutrition. This course is cross-listed with CHE-303.

Course Types: Scientific Reasoning

Prerequisite(s): Take 1 group: ((CHE-209 CHE-209L or CHE-219 CHE-219L) and BIO-101 BIO-101L BIO-102 BIO-102L) or ((CHE-209 CHE-209L or CHE-219 CHE-219L)and BIO-107 BIO-107L BIO-108 BIO-108L) or be a chemistry major and take (CHE-219 CHE-219L CHE-220 CHE-220L)

Corequisite(s): Take BIO-303L

BIO-303L Biochemistry Lab (1 credits)

This lab supports BIO-303 lecture course. Students required to take BIO-303 are also required to take BIO-303L (except for Physician Assist students).

Course Types: Scientific Reasoning

Corequisite(s): Take BIO-303

BIO-304 Microscopic Anatomy (4 credits)

This course examines the organ systems of the body microscopically. The development, histology, histophysiology and histopathology of the tissues and organs of the body will be presented in lecture. The lab incorporates microscopic examination of the organ systems and training in processing of tissue for imaging and instruction in the use of imaging equipment. The course consists of two lectures and four hours of laboratory a week.

Prerequisite(s): Take (BIO-101, BIO-101L, BIO-102, BIO-102L) or (BIO-107, BIO-107L, BIO-108, BIO-108L)

Corequisite(s): Take BIO-304L

BIO-304L Microscopic Anatomy Lab (0 credits)

This course examines the organ systems of the body microscopically. The development, histology, histophysiology and histopathology of the tissues and organs of the body will be presented in lecture. The lab incorporates microscopic examination of the organ systems and training in processing of tissue for imaging and instruction in the use of imaging equipment. The course consists of two lectures and four hours of laboratory a week.

Prerequisite(s): Take (BIO-101, BIO-101L, BIO-102, BIO-102L) or (BIO-107, BIO-107L, BIO-108, BIO-108L)

Corequisite(s): Take BIO-304

BIO-305 Human Physiology (3 credits)

This course will examine the functions of various human organ systems and study the functional relationships of the human organism. Students will explore the basic function and integration of human organ systems, and how they respond to changes in the environment. Students will recognize and apply biological themes such as the relationship between structure/function, systems, and evolution to the body's organ systems.

Course Types: Natural Sciences

Prerequisite(s): Take BIO-101 BIO-101L BIO-102 BIO-102L

BIO-306 Ecology, Evolution & Behavior (4 credits)

This course covers evolution, ecology, and animal behavior, and their interactions. The theory of evolution successfully explains the natural world (past and present) and is the central theme of all of biology. Ecology is the study of how organisms interact with their environment - both biotic and abiotic. These different interactions create different adaptations as dictated by natural selection and other mechanisms of evolution. Animal behavior examines the evolutionary and ecological factors that determine behavior within and between species. Topics range from foraging and anti-predator strategies to mating behavior and mating systems.

Course Types: Natural Sciences

Prerequisite(s): Take BIO-101 BIO-101L

Corequisite(s): Take BIO-306L

BIO-306L Ecology, Evolution & Behavior Lab (0 credits)

This course covers evolution, ecology, and animal behavior, and their interactions. The theory of evolution successfully explains the natural world (past and present) and is the central theme of all of biology. Ecology is the study of how organisms interact with their environment - both biotic and abiotic. These different interactions create different adaptations as dictated by natural selection and other mechanisms of evolution. Animal behavior examines the evolutionary and ecological factors that determine behavior within and between species. Topics range from foraging and anti-predator strategies to mating behavior and mating systems.

Course Types: Natural Sciences

Prerequisite(s): Take BIO-101 BIO-101L

Corequisite(s): Take BIO-306

BIO-307 Pathophysiology (3 credits)

This is a study of disease processes as disturbances of the body's homeostasis. The body's defense mechanisms and their breakdown are emphasized. Various clinical assessment methods are discussed. The course consists of three lectures a week.

Course Types: Teamwork

Prerequisite(s): Take BIO-107,BIO-107L BIO-108,BIO-108L Take (CHE-111,CHE-112) or (CHE-101 CHE-101L CHE-102 CHE-102L) Chiropractic students can take BIO-507L BIO-508L BIO-659 BIO-660

BIO-309 Virology (3 credits)

This course is the study of structure and activity of animal, plant and bacterial viruses. This course is three lectures.

Prerequisite(s): Take BIO-303

BIO-310 Immunology (3 credits)

Individuals are continually exposed to foreign substances (antigens) and respond to them in ways that are both harmful and beneficial. Many areas of biology use the in vitro techniques of immunology. Thus, immunology integrates such diverse fields as genetics, biochemistry, physiology and medicine and is relevant for biology and health science students alike. The purpose of this course is therefore to introduce the student to the chemistry of antigens and antibodies, the biology of the immune response, including both harmful and beneficial aspects in the function of the cells, organs and molecules of the immune system. Immunologic techniques and their applications will also be examined.

Course Types: Information Literacy; Thinking Process

Prerequisite(s): Take (BIO-101 BIO-101L ,BIO-102, BIO-102L) OR BIO-107, (BIO-107L,BIO-108, BIO-108L) AND Take CHE-101,CHE-102; Take (BIO-101 BIO-101L ,BIO-102, BIO-102L) OR BIO-107, (BIO-107L,BIO-108, BIO-108L) AND Take CHE-101,CHE-102

BIO-312 Molecular Cell Biology (4 credits)

This course teaches student to read and interpret scientific literature, from reviews to research papers. Students learn to draw a connection between molecular and organismal phenotypes (for example in the case of mitochondrial diseases), how different metabolisms cross-talk and are related to human health, and how cutting edge discoveries like RNA interference and CRISPR changed the face of modern science. This course consists of three hours of lectures and a companion three-hour lab per week.

Prerequisite(s): Take 1 of (BIO-102 BIO-102L) or (BIO-108 BIO-108L); Take BIO-303 BIO-303L

BIO-312L Cellular and Molecular Biology Lab (0 credits)

This lab is a co-requisite of BIO312. Students learn to grow human cells on plastic (tissue culture), a skill invaluable in the biological sciences and research, plus other cutting edge molecular techniques highly sought after on the job market.

Corequisite(s): Take BIO-312

BIO-314 Botany (4 credits)

This course is a survey of biology of plants with emphasis on taxonomy, morphology, physiology and the importance to man. This course is three lectures and three hours of lab.

Prerequisite(s): Take BIO-101 BIO-101L BIO-102 BIO-102L

Corequisite(s): Take BIO-314L

BIO-314L Botany Lab (0 credits)

This course is three hours of lab.

Corequisite(s): Take BIO-314

BIO-315 Biology of Consciousness (3 credits)

This course examines consciousness with an emphasis on its biological aspects. Students will be encouraged to actively participate in discussions and to critically think about the neurobiological mechanisms underlying consciousness and how they relate to philosophical and psychological aspects of consciousness. Topics include neuroanatomy and the neural correlates of consciousness, altered states of consciousness including the effects of drugs, neuropathologies, evolution of consciousness, and animal minds.

Course Types: Foundational Gen Ed; Natural Sciences; Scientific Reasoning; Themed

BIO-317 Comparative Anatomy (4 credits)

This is a study of vertebrates and their chordate origins, including an overview emphasizing their historical relationships. The major systems, such as integument, muscular, nervous, endocrine, circulatory, and skeletal, are presented with examples from the major vertebrate groups. The course consists of three lectures and three hours of laboratory a week.

Prerequisite(s): Take (BIO-101 BIO-101L BIO-102 BIO-102L) or (BIO-107 BIO-107L BIO-108 BIO-108L)

Corequisite(s): Take BIO-317L

BIO-317L Comparative Anatomy Lab (0 credits)

The course consists of three laboratory hours a week.

Corequisite(s): Take BIO-317

BIO-320 Developmental Biology (4 credits)

This is a study of the principles of development and their application to animal and plant embryos, regeneration, metamorphosis, cancer and related processes. The laboratory includes observation and experimentation with living animal and plant material, plant tissue culture, and examination of prepared slides. The course consists of three lectures and three hours of laboratory a week.

Prerequisite(s): Take BIO-101 BIO 101L BIO-102 BIO 102L; Take BIO-302

Corequisite(s): Take BIO-320L

BIO-320L Dev Biology Lab (0 credits)

Corequisite(s): Take BIO-320

BIO-330 Environmental Microbiology (4 credits)

This course and required laboratory will focus on microbes, their biochemistry and their interactions with higher animals in specific ecologies. Microbes play a primary, and often overlooked, role in every ecosystem on Earth. The unique biochemistries of these microbes are responsible for a wealth of activities critical to human and planetary health, including oxygen generation, carbon and nitrogen bioavailability, bioremediation of pollutants, decomposition of organic matter, nutrient cycling and human sanitation. This course is not intended as the required course in a health sciences major as it eschews medical microbes in favor of environmentally or commercially important microorganisms. This course requires a weekly 3 hour lecture and a 3 hour lab.

Prerequisite(s): Take (BIO-102 BIO-102L or (BIO-108 BIO-108L)); Four (4) credits of college level chemistry.

Corequisite(s): Take BIO-330L

BIO-330L Environmental Microbiology Lab (0 credits)

This course and required Lab will focus on microbes, their biochemistry and their interactions with higher animals in specific ecologies. Microbes play a primary, and often overlooked, role in every ecosystem on Earth. The unique biochemistries of these microbes are responsible for a wealth of activities critical to human and planetary health, including; oxygen generation, carbon and nitrogen bioavailability, bioremediation of pollutants, decomposition of organic matter, nutrient cycling and human sanitation. This course is not intended as the required course for a health sciences major as it eschews medical microbes in favor of environmentally or commercially important microorganisms. This course requires a weekly 3 hour lecture and 3 hour laboratory.

Corequisite(s): Take BIO-330

BIO-331 Conservation Biology (4 credits)

Conservation Biology combines ecology, physiology, molecular biology, genetics, and evolutionary biology in order to conserve biological diversity. It is the aim of conservation biology to understand the human threats to biodiversity and prevent any further loss. Topics covered will include, defining, measuring, and patterns of biodiversity, the negative effect of habitat loss, invasive species, pollution, over population, and over harvesting on biodiversity, strategies used to combat threats and sustain biodiversity and consideration of economic and ethical tradeoffs in the conservation of threatened species. Special attention will be paid to current issues related to biodiversity. This course requires a weekly 3 hour lecture and a 3 hour laboratory.

Prerequisite(s): Take BIO-101 BIO-101L and (BIO-102 BIO-102L or BIO-303 BIO-30L or CHE-303 CHE-303L)

Corequisite(s): Take BIO-331L

BIO-331L Conservation Biology Lab (0 credits)

Lab for BIO-331

Corequisite(s): Take BIO-331

BIO-332 Environmental Health (3 credits)

Environmental health examines the impact of the environment on human health. This includes 1) the effect of environmental components, such as pollutants, pathogens, and toxins, on human health, 2) energy resource uses and its effect on human health, 3) food safety, 4) environmental hazards found in the work place, and 5) environmental degradation as it relates to human health and wellbeing. This course will also examine the methods of environmental assessment and the role of public policy related to environmental health.

Prerequisite(s): Take (CHE-101 CHE-101L CHE-102 CHE-102L) or (CHE-111 CHE-112 CHE-113); Take BIO-107 BIO-107L BIO-108 BIO-108L

BIO-335 Pharmacology I (3 credits)

This series integrates the principles and mechanisms of action and drug effect with the pharmacotherapy of common disease and syndromes.

Prerequisite(s): Take BIO-101 BIO-101L BIO-102 BIO-102L

BIO-336 Pharmacology II (3 credits)

This course is a continuation of BIO-335

Course Types: Oral Communication

Prerequisite(s): Take BIO-335

BIO-339 Human Gross Anatomy (6 credits)

This is a lecture and laboratory course in human gross anatomy, which uses cadaver dissection and other materials illustrative of human anatomy. Emphasis will be placed upon the anatomy of skeletal muscles, including their bony attachments, nerve and blood supply and their functions in movements. Additional dissections will involve a survey of abdominal and thoracic organs, anatomy of the head and contents of the cranial cavity. The course consists of two lecture hours and eight lab hours a week.

Prerequisite(s): Take (BIO-107 BIO-107L BIO-108 BIO-108L) or BIO-317.

Corequisite(s): Take BIO-339L. Physician Assistant students will take BIO-639L.

BIO-339L Gross Anatomy Lab (0 credits)

Corequisite(s): Take BIO-339

BIO-344 Advanced Biochemistry (3 credits)

The Advanced Biochemistry course builds on the foundations taught in BIO 303 - Biochemistry, offering an in-depth overview of more complex topics related to all classes of biomolecules. The significant relationship between chemical structure and physiological role is discussed in the context of proteins, lipids, and carbohydrates. Topics include protein folding and functional interaction, biological membrane structure and transport, biosignaling, hormone action, and an overview of catabolic and anabolic biochemical pathways.

Course Types: Natural Sciences

Prerequisite(s): Take BIO-303

Corequisite(s): Take BIO-344L

BIO-344L Advanced Biochemistry Lab (1 credits)

The Advanced Biochemistry laboratory reinforces the concepts taught in the associated lecture through experimental design, modern lab technology use, and data analysis. In addition, current scientific papers describing the use of biochemical techniques are discussed, analyzed and presented. The main objectives are for students to develop hands-on experience with experimental methods used in biochemical and molecular biology research, as well as to introduce students to the fundamentals of scientific writing and data presentation.

Course Types: Natural Sciences; Written Communication

Prerequisite(s): Take BIO-303L

Corequisite(s): Take BIO-344

BIO-350 Fundamentals of Genomics, Proteomics & Bioinformatics (3 credits)

This course will offer an introduction into the novel disciplines of genomics, proteomics and bioinformatics, providing students with a solid intellectual framework for understanding biological pathways, networks and molecular systems in an integrated, multidisciplinary fashion. The course will follow an interactive, problem-based instructional approach, using several mathematics exercises that utilize statistical and probability calculations to add quantitative rigor to the interpretation of biological data sets. The course will be based on case studies taken from scientific publications and Internet-based bioinformatics tools will be used for data analysis. The content will include all major areas of biology, including DNA and protein sequences, microarrays, and systems biology.

Course Types: Writing Intensive

Prerequisite(s): Take BIO-303 and MAT-125.; Take any CSC (Computer Science) course.

Corequisite(s): Take BIO-350L

BIO-350L Fundamentals Genomics, Proteomics and Bioinformatics Lab (0 credits)

Lab for BIO-350

Corequisite(s): Take BIO-350

BIO-351 Computational Biology (4 credits)

Description of BIO 351 should be same as the printed catalog: This course and required lab are intended to serve as an introduction to the problems encountered in modern biology research, with a special focus on the usage of modern computer-dependent techniques to explain biological phenomena. Many modern biological studies are hindered by the sheer volume of experimental data produced. These data often cannot be efficiently or accurately interpreted without computer assistance, yet many scientists lack the necessary skill set to do so. This course will instruct students in the challenges of designing, implementing and analyzing in vivo or in vitro generated experimental results using in silico techniques. This will be accomplished through a project-based learning format. This course requires three hours of lecture a week and a weekly three hour laboratory.

Prerequisite(s): Take BIO/CHE-303 or permission of the instructor.

Corequisite(s): Take BIO-351L

BIO-351L Computational Biology Lab (0 credits)

Lab to accompany BIO 351

Corequisite(s): Take BIO-351

BIO-369 McAT, DAT, GRE Exam Review (0 credits)

This is a non-credit course designed to guide and assist students in reviewing for entrance examinations for health professional schools and graduate schools. The entrance exams covered include: the Medical College Admission Test, Dental Admission Test, Pharmacy College Admission Test, GRE General Test and GRE Biology Test. The course provides an introduction to the exams, diagnostic testing, assistance in reviewing the appropriate subject areas, and the administration of practice exams.

BIO-370 MCAT, DAT and GRE Review (0 credits)

This is a non-credit course designed to guide and assist students in reviewing for entrance examinations for health professional schools and graduate schools. The entrance exams covered include: Medical College Admission Test, Dental Admission Test, Pharmacy College Admission Test, GRE General Test and GRE Biology Test. The course provides an introduction to the exams, diagnostic testing, assistance in reviewing the appropriate subject areas, and the administration of practice exams.

BIO-375 Math Modeling in Biology (3 credits)

Techniques for expressing biological molecules and concepts as mathematical expressions for analysis and comparison.

Prerequisite(s): Take MAT-125 and (BIO-102 or BIO-303); Take 1 computer science (CSC or IT) course. CSC-151 or IT-111 is recommended.

BIO-389 Special Topics (6.00000 credits)

This course presents an opportunity to study a selected topic in the biological sciences. Topics can originate with faculty or students.

BIO-389L Special Topics Lab (1 credits)**BIO-390 Special Topics (3 credits)**

This course presents an opportunity to study a selected topic in the biological sciences. Topics can originate with faculty or students.

BIO-407 Research at D'Youville (1-4 credits)

Library or laboratory research problems are carried out under the direction of staff members on campus.

BIO-408 Research At NYC (1-4 credits)

Library or laboratory research problems are carried out under the direction of staff members on campus.

BIO-479 Independent Study (1-3 credits)

Qualified students may investigate selected topics with permission of the instructor.

BIO-480 Independent Study (1-3 credits)

Qualified students may investigate selected topics with permission of the instructor.

BIO-499 Capstone Experience (1-3 credits)

This course will be a culmination of the lab and science skills acquired by the students in their respective academic programs. The capstone experience will use these skills in either an independent research project, an internship, or a service learning experience. These projects will be conducted under the supervision of a full-time professor. While working on this project students will learn how to maintain a research notebook or journal, complete a literature review using appropriate databases, and present their experience by using oral and/or written means of communication. In addition, there will be weekly scheduled meetings among all the students registered for this course to share their progress and be provided with career building exercises, such as writing a CV / resume and mock job or graduate school interviews. The capstone course will include a final assignment, requiring the student to reflect upon how their college and capstone experience relates to the general education themes.

Course Types: Capstone; Information Literacy; Natural Sciences

BIO-504 Microscopic Anatomy (4 credits)

This course is an in-depth microscopic examination of the organ systems of the body. The development, histology, histophysiology, and histopathology of the tissues and organs of the body will be presented in lecture. Chemistry and biochemistry of the structures will be covered and discussed. The lab incorporates microscopic examination of the organ system and training in processing of tissue for imaging and the use of imaging equipment and the chemical properties and uses of traditional and current staining methods. This course consists of three lectures and three hours of laboratory a week.

Corequisite(s): Take (BIO-101 BIO-101L BIO-102 BIO-102L) or (BIO-107 BIO-107L BIO-108 BIO-108L) or (BIO-517 BIO-517L) or ANA-601

BIO-504L Microscopic Anatomy Lab (0 credits)

Lab for BIO-504

BIO-505 Neurobiology (4 credits)

This is a lecture and laboratory course studying the human nervous system. Emphasis is placed on the science, biology, and biochemistry of nervous system anatomy and physiology, including research techniques used to study the nervous system, organization and development of the nervous system, neuroanatomy, fundamental concepts of cellular and molecular neurobiology, underlying neuroanatomical and neurophysiological dysfunctions of neurological disorders, sensory and motor systems, and neural tracts. The laboratory includes neuroanatomy models and cadaveric specimens. This course consists of three lectures and three hours of laboratory a week.

Prerequisite(s): Take (BIO-107 BIO-107L BIO-108 BIO-108L) or take (BIO-317 BIO-317L) or take (BIO-517 BIO-517L).

Corequisite(s): Take BIO-505L

BIO-505L Neurobiology Lab (0 credits)

Lab for BIO-505

Corequisite(s): Take BIO-505

BIO-507L Histophysiology (I) Lab (1 credits)

A study of the microscopic anatomy and histophysiology of cells and tissues with particular emphasis on cell structure and organelles, the cell cycle, the various types of epithelium, connective tissue proper, the skeletal, muscular and nervous systems and the tissues. Abnormalities in structure and function are introduced.

BIO-508L Histophysiology (II) Lab (1 credits)

This course is a continuation of BIO 507L-Histophysiology Lab (I). This course focuses on the correlation between microscopic structure and function of special sense organs, the integument, the lymphatic, respiratory, digestive, endocrine, urinary, and reproductive systems. Abnormalities in structure and function are introduced.

BIO-511 Histology I (1 credits)

Histology I is the first in a sequence of laboratory courses microscopically examining cells, tissues and organs in correlation with Physiology I. This course includes cells, categories of tissues, and the liver, pancreas, and gallbladder.

BIO-512 Histology II (1 credits)

Histology II is the second in a sequence of laboratory courses microscopically examining cells, tissue and organs in correlation with Physiology II. This course includes blood cells, the heart, respiratory, urinary, reproductive, and endocrine tissues.

Corequisite(s): Take BIO-511

BIO-517 Comparative Anatomy (4 credits)

This is a analysis of vertebrates and their chordate origins, including a summarization emphasizing their historical relationships. The major systems, such as integument, muscular, nervous, endocrine, circulatory, and skeletal, are presented and explored with examples from the major vertebrate groups. The course consists of three lectures and three hours of laboratory a week.

Corequisite(s): Take ANA-601 and BIO-517L

BIO-517L Comparative Anatomy Lab (0 credits)

Lab for BIO-517.

Corequisite(s): Take BIO-517

BIO-520 Developmental Biology (4 credits)

This is a study of the principles of development and their application to animal and plant embryos, regeneration, metamorphosis, cancer and related processes. The laboratory includes observation and experimentation with living animal and plant material, plant tissue culture and examination of prepared slides.

Prerequisite(s): Take BIO-302 BIO-302L

Corequisite(s): Take BIO-520L

BIO-520L Developmental Biology Lab (0 credits)

Lab for BIO-520

Corequisite(s): Take BIO-520

BIO-523L History of Anatomy Lab (1 credits)

This study abroad experience in Florence, Italy has duration of two weeks. This course will follow the evidence of healthcare, art and science as it relates to Italy and the Italian Renaissance. Lessons will introduce the students with use of genuine objet d'art to the history of art and medicine starting from the Middle Ages, through the great "revolution in health care" in Florence during the golden centuries of the Renaissance through modern-day health care. The course consists of approximately 20 lessons that will occur in various venues including the Villa La Quiete, art and history museums, galleries, the University of Florence and the Botanical Gardens of Florence. Emphasis will be on integration of contemporary anatomy with historical models.

BIO-530L Musculoskeletal Anatomy Lab (1 credits)

Musculoskeletal Anatomy Lab is a laboratory based one credit hour course that covers the attachments, innervation, blood supply, and movements of the skeletal muscles of the body. The course also explores anatomy that is related to the attachment and function of skeletal muscles. Students will also learn the development of muscles from an embryologic point of view.

BIO-535 Embryology (1 credits)

The focus of this course is on the anatomy of human embryogenesis. Topics include fertilization, implantation, gastrulation, neurulation and organogenesis of a variety of structures. Different pathologies will be discussed as they relate to the developmental process of the human body.

BIO-540 Physiology I (5 credits)

This is the first course in a two-course sequence. These courses are comprised of cytological features that represent the underpinnings of such functions as nerve impulse and neurotransmission, skeletal muscle contraction, cardiac muscle excitation and coordination of contraction, processes of electrolyte and water balance, actions of chemical messengers such as hormones and drugs, gas transport and cellular respiration, nutrition, metabolism, and excretion.

BIO-541 Physiology II (5 credits)

Taken in sequence after BIO 540 and covers the remaining physiology of the body's organ systems. Topics covered in part two include: cardiovascular, hematopoietic, respiratory, renal, and endocrine. Physiology dictates the function of each of these systems. Emphasis on molecular action will be strong.

Prerequisite(s): Take BIO-540

BIO-599 Capstone Research (1-3 credits)

This course is designed to be a capstone experience in the form of an independent research experience, internship/practical experience, or service-learning experience. Through this course, the student will combine knowledge and skills learned in the coursework of the program into an integrated project that will conclude in an advanced paper and presentation of the student's work.

Prerequisite(s): Take ANA-601 or HAPH-608

BIO-603 Biochemistry (3 credits)

This one-semester course emphasizes structure/function relationships among the components responsible for the biochemical functions of life. Topics include proteins, enzymes, carbohydrates, bioenergetics, metabolism (catabolism and anabolism), lipids, membranes, nucleic acids, biotechnology, biochemical methods, vitamins and nutrition.

BIO-603L Biochemistry Lab (1 credits)

This lab is consistent with material covered in lectures in BIO-603.

BIO-604 Biochemistry II (2 credits)

A lecture course building on the knowledge of biological molecules - including but not limited to protein, carbohydrates, lipids, nucleic acids, hormones, and vitamins - structure and function and exploring the metabolism of those molecules.

Prerequisite(s): Take BIO-603 and BIO-603L

BIO-607 Pathophysiology (3 credits)

This is a study of disease processes as disturbances of the body's homeostasis. The body's defense mechanisms and their breakdown are emphasized. Various clinical assessment methods are discussed. The course consist of three lectures a week.

BIO-608 Microbiology (3 credits)

This is an introduction to the classification, morphology and physiology of microorganisms, particularly of bacteria and viruses, with laboratory emphasis on sterile technique, cultural characteristics and physiology of bacteria. The course consists of three lectures and three hours of laboratory per week.

BIO-608L Microbiology Lab (1 credits)

This lab is consistent with material covered in lectures in BIO-608.

BIO-609 Microbiology II (2 credits)

This course is a continuation of, and expansion to, material introduced in BIO 608. It will continue to focus on the principles of infectious disease, major pathogens responsible for infectious diseases of humans, and the human immune response. The course will include the classification, morphology and physiology of microbes, with particular emphasis on eukaryotic pathogens.

Prerequisite(s): Take BIO-608 and BIO-608L

BIO-610 Immunology (3 credits)

Humans are continually exposed to foreign substances (antigens) and respond to them in ways that are both harmful and beneficial. Many areas of biology use the in vitro techniques of immunology. Thus, immunology integrates such diverse fields as genetics, biochemistry, physiology and medicine and is relevant for biology and health science students alike. The purpose of this course is therefore to introduce the student to the chemistry of antigens and antibodies, the biology of the immune response, including both harmful and beneficial aspects in the function of the cells, organ and molecules of the immune system. Immunologic techniques and their applications will also be examined.

BIO-615 Endocrinology (2 credits)

This course will examine the anatomy, physiology and classes of hormones found in the endocrine system and their response to triggers in different areas of the body. Students will also study the pathophysiology of common endocrine disorders.

BIO-620 Cranioaxial Anatomy (3 credits)

This is the second of a sequence of courses examining human gross anatomy. This course is an in-depth study of the head, including the brain and cranial nerves, the regions of the neck, and the back of the human body.

BIO-620L Cranioaxial Anatomy Lab (1 credits)

Corresponding lab for BIO 620. This is the second of a sequence of courses examining human gross anatomy. This course is an in-depth study of the head, including the brain and cranial nerves, the regions of the neck, and the back of the human body.

Corequisite(s): Take BIO-620

BIO-639 Human Gross Anatomy (6 credits)

This is a lecture and laboratory course in human gross anatomy, which uses cadaver dissection and other materials illustrative of human anatomy. Emphasis is placed on the anatomy of skeletal muscles, including their bony attachments, nerve and blood supply, and functions in movements. Additional dissections involve a survey of abdominal and thoracic organs, anatomy of the head and contents of the cranial cavity.

Corequisite(s): Take BIO-639L For Chiropractic students, BIO-639XD is also a required Co-requisite; Take (BIO-507L BIO-508L) or (BIO-107 BIO-107L BIO-108 BIO-108L) or (BIO-317 BIO-317L) or (BIO-517 BIO-517L) or equivalent.

BIO-639L Human Gross Anatomy Lab (0 credits)

This is a lecture and laboratory course in human gross anatomy, which uses cadaver dissection and other materials illustrative of human anatomy. Emphasis is placed on the anatomy of skeletal muscles, including their bony attachments, nerve and blood supply, and functions in movements. Additional dissections involve a survey of abdominal and thoracic organs, anatomy of the head and contents of the cranial cavity.

Corequisite(s): Take BIO-639

BIO-639XD Human Gross Anatomy Extra Dissection Lab (0 credits)

This is the required extra dissection time that goes hand-in-hand with the lecture and laboratory course in human gross anatomy, which uses cadaver dissection and other materials illustrative of human anatomy. Emphasis is placed on the anatomy of skeletal muscles, including their bony attachments, nerve and blood supply, and functions in movements. Additional dissections involve a survey of abdominal and thoracic organs, anatomy of the head and contents of the cranial cavity.

Corequisite(s): Take BIO-639 BIO-639L

BIO-640 Human Anatomy Dissection (4 credits)

Anatomy is concerned with the structure and function of the body. It is the basic biological course in which students learn the morphological setting upon which clinical knowledge and experiences are built. This course follows a region approach to the study of human anatomy for students in the Doctor of Physical Therapy (DPT) program. Through laboratory dissections and correlated lectures designed to link anatomy to clinical practice, students will achieve a working knowledge of the human body.

BIO-650 Pathology I: Basics of Pathology (3 credits)

This is a study of the cellular changes that occur in deviations from homeostasis. The first course in sequence surveys the basics of pathologic change as a result of injury of chemical, nutritional, with a focus on the cellular level.

Prerequisite(s): Take BIO-659 BIO-660

BIO-651 Pathology II: Systems Pathology (3 credits)

The second of a two-course series, Systems Pathology surveys the presentation of disease in the organ systems of the body. Topics covered include disorders of the organ systems, disorders of the musculoskeletal system, and disorders of the nervous system.

Prerequisite(s): Take BIO-650

BIO-659 Advanced Physiology I (3 credits)

These courses are comprised of discussions of the molecular attributes of cytological features that represent the underpinnings of such functions as nerve impulse and neurotransmission, skeletal muscle contraction, cardiac muscle excitation and coordination of contraction, processes of electrolyte and water balance, actions of chemical messengers such as hormones and drugs, gas transport and cellular respiration, nutrition, metabolism and excretion.

BIO-660 Advanced Physiology II (3 credits)

These courses are comprised of discussions of the molecular attributes of cytological features that represent the underpinnings of such functions as nerve impulse and neurotransmission, skeletal muscle contraction, cardiac muscle excitation and coordination of contraction, processes of electrolyte and water balance, actions of chemical messengers such as hormones and drugs, gas transport and cellular respiration, nutrition, metabolism and excretion.

BIO-686 Introduction to Post- Secondary Teaching in Biology & Anatomy (1 credits)

This course is designed to introduce students to teaching biology and anatomy as a career in higher education, current issues in education, practice developing and enacting lessons/activities, and hone critical reflective skills as they relate to the development of a teaching self. This course includes a variety of teaching and learning approaches: whole and small group discussions, text-based/multi-media interaction with course materials, individual practices, collaborative learning groups, online discussions and activities, and student-led lessons/activities.

BIO-689 Special Topics (3.00000 credits)