

**BIOL - 1013 Essentials of Exercise Physiol, 3.00 Credits**

Level: Lower

Gen Ed - Natural Sciences, Liberal Arts and Science

This is an internet-based course intended for both science and non-science majors covering the basic study of exercise physiology. Topics include the role of nutrition in energy-producing pathways and human growth and development; nutritional and common pharmacological aids used to support and enhance exercise and athletic performance; study of metabolic production of energy and its application in the human capacity for work; and study of select body systems and the principles of exercise training with resultant physiological adaptations that could be expected from such training. The course concludes with a study of the role of exercise in the maintenance of health and the prevention of disease.

**BIOL - 1101 Topics in General Biology, 1.00 Credit**

Corequisite(s):

Level: Lower

A one-credit hour course to supplement the General Biology (BIOL 1104) course for biology majors. The focus of this course is to expand on topics discussed during the lecture/laboratory portions of BIOL 1104 and to discuss current topics of interest to biology students. The format of the course is reading and discussion. Each participant will be responsible for being a discussion leader at least once during the semester. The discussion leader's role is to introduce the topic, provide background information about the subject, and encourage the group to offer comments and ask questions. Topics for discussion may be directly related to lecture material or may originate from current media sources, as long as that topic was already introduced in the BIOL 1104 class lecture or lab and the students have some familiarity with the subjects.

**BIOL - 1104 General Biology I, 4.00 Credits**

Level: Lower

Applied Learning-Other, Course Fee \$20.00, Gen Ed - Natural Sciences, Liberal Arts and Science

This course incorporates a survey of molecular, cellular, and hereditary principles. Topics include the chemistry and physics of cellular activities; the ultra-structure of cells, photosynthesis and cellular metabolism; the structure and function of DNA; recent developments in DNA bio-technology; and the basic aspects of genetic principles.

**BIOL - 1113 Biology of Human Sexuality, 3.00 Credits**

Level: Lower

Gen Ed - Natural Sciences, Liberal Arts and Science

This internet-based course studying human sexuality, approaches the subject from the perspective of health and the discipline of biology, with attention given to the historical and contemporary perspectives concerning the topic. Reproductive anatomy is examined, along with the physiological response of sexual arousal. The events of fertilization, pregnancy and childbirth are studied along with examples of the contraceptives used to prevent it. Puberty and sexual development is considered and the role of biology is examined in the areas of gender, sexuality, attraction and love. The course concludes with an overview of common sexual difficulties, a study of sexually transmitted diseases and defines the act of rape and sexual assault.

**BIOL - 1114 Human Anat & Physiology I, 4.00 Credits**

Level: Lower

Gen Ed - Natural Sciences, Liberal Arts and Science

This is a lecture and lab based online course that is the first in a two-semester sequence, including laboratory components, that covers the structure and function of the human body. General study covers the organization, covering, support, and movement of the body. Topics include an orientation to the human body, chemistry of life, cells and tissues, and the integumentary, musculoskeletal, nervous, and sensory systems.

**BIOL - 1133 Marine Biology, 3.00 Credits**

Level: Lower

Applied Learning-Intl/Dom Trvl, Liberal Arts and Science

This course focuses on the biology of organisms residing in the sea, from the diversity of planktonic communities to marine megafauna, taking into consideration the ecological principles that govern marine life. The course aims to provide a solid educational background in basic and applied marine biology. Emphasis will be placed on marine environment issues and the adaptive and evolutionary mechanisms of organisms that allow them to occupy marine habitats. In particular, the Mediterranean Sea will play a central role in the course subjects, profiting from the availability of unique ecosystems and a nearby renowned marine research institute to conduct thematic field trips and practical tutorials.

**BIOL - 1223 Introduction to Forestry, 3.00 Credits**

Level: Lower

Applied Learning-Field Study, Course Fee \$3.00, Gen Ed - Natural Sciences, Liberal Arts and Science

This course is designed to familiarize students with the sustainable management of New York hardwood forests. Students are introduced to the history of forests and forestry practices in North America and New York State, as well as basic tree biology, silvicultural systems, and forest management. Major emphases are placed on practical management strategies for maintaining and developing wood lots and farm forests for a variety of desired outcomes, including lumber, fuel, aesthetics, erosion control, and wildlife habitat. The financial aspects of various forestry strategies also are discussed. As part of the practical component of the course, students will be required to complete a detailed forest management plan.

**BIOL - 1304 Botany, 4.00 Credits**

Level: Lower

Applied Learning-Other, Course Fee \$10.00, Gen Ed - Natural Sciences, Liberal Arts and Science

Each of us is intimately involved with plants. We wear them, ingest them, exchange gas molecules with them, live under them, etc. In this course students will develop knowledge of plant morphology (form) and function that later enhances their lives. Topics include the study of human food, ornamental plants, feed, forestry, and any other use of plants to sustain life on the planet Earth or provide other ecosystem services. The laboratory portion of the course includes field ecology and classification of important plant groups in addition to morphological and anatomical study of the major plant organs. Use of the laboratory, the college farm, field trips, and the plant science greenhouse integrates various teaching methods for the above subjects.

**BIOL - 1313 Nutrition, 3.00 Credits**

Level: Lower

Gen Ed - Natural Sciences, Liberal Arts and Science

This course is intended for both the science and non-science major. Coverage will include the fundamental biochemical aspects of the essential nutrients and their effects when consumed in less than recommended or excessive amounts. These nutritional facts will help answer some of the questions brought forward concerning the relationship between food and heart disease, weight control, preservatives, cancer, athletic performance, vegetarianism, pregnancy and lactation, just to name a few. Beyond these facts will be the understanding of the non-nutrient characteristics of food as related to culture, family and society. Most importantly, this course will present the tools necessary to properly evaluate the purchase and preparation of nutritious foods via personal assessment.

**BIOL - 1404 Anatomy & Physiology I, 4.00 Credits**

Level: Lower

Applied Learning-Other, Course Fee \$12.00, Gen Ed - Natural Sciences, Liberal Arts and Science

This course is the study of the gross and microscopic anatomy of various human systems, emphasizing how structure facilitates function. The areas emphasized are: basic anatomical and directional terminology; fundamental concepts and principles of cell biology; histology; the integumentary system; the nervous system and special senses; the skeletal system; and the muscular system.

**BIOL - 2111 Biological Sciences Seminar, 1.00 Credit**

Prerequisite(s): BIOL 1101 with D or better and BIOL 2204 with D or better and CHEM 2984 with D or better

Level: Lower

Applied Learning-Creative Work

This course is intended for students typically in their fourth semester of the two-year Biological Sciences curriculum. The course is designed to prepare the student for transfer to a four-year institution and/or enter the workforce. Students are introduced to the theoretical and practical aspects of preparing and delivering a full-feature (40-45 minute length) presentation on a given topic within the realm of a biological discipline.

**BIOL - 2204 General Biology II, 4.00 Credits**

Prerequisite(s): BIOL 1104 with D or better

Level: Lower

Applied Learning-Other, Course Fee \$15.00, Gen Ed - Natural Sciences, Liberal Arts and Science

A continuation of BIOL 1104 (General Biology I), with emphasis on animal and plant systematics, evolution and ecology. Laboratory topics include the study of the following mammalian organ systems: digestion, respiration, circulation, homeostasis, reproduction, chemical and nervous control, and musculoskeletal structure and function. Lecture topics include systematics, evolution, ecosystems, and bioenergetics, including human impacts on the environment.

**BIOL - 2214 Human Anat & Physiology II, 4.00 Credits**

Prerequisite(s): BIOL 1114 with C or better or BIOL 1404 with C or better

Level: Lower

Liberal Arts and Science

The second in a two-semester Internet-based course sequence, including laboratory components, that covers the structure and function of the human body. General issues include the maintenance of the human body, pregnancy, human development and heredity. Topics include the endocrine, blood, cardiovascular, lymphatic, immunity, respiratory, digestive, urinary, and reproductive body systems.

**BIOL - 2301 Human Biology Laboratory, 1.00 Credit**

Prerequisite(s): BIOL 2303 with D or better \*

Level: Lower

Applied Learning-Other, Course Fee \$24.00, Liberal Arts and Science

This course is a group of laboratory exercises to aid in the study of human systems and their physiology. The laboratory sessions are designed to provide students with a basic understanding of the structure and functions of cells, tissues, and organ systems. The goals of the course are to promote an appreciation for the remarkable complexity of our bodies, to develop a proficiency in the use of laboratory equipment and the proper handling of materials, and to foster the development of self-sufficiency in the conduct of laboratory experiments and observations. This course is to be taken either concurrent with, or following completion of, BIOL 2303.

**BIOL - 2303 Human Biology, 3.00 Credits**

Level: Lower

Gen Ed - Natural Sciences, Liberal Arts and Science

An introduction study of human systems and their physiology. Included in the course are examination of how the body normally functions at the cellular, tissue, organ system levels. Topics will include basic chemistry, cell structure and biochemistry, digestion, circulation and blood, immunity, respiration, excretion, nervous integration, senses, endocrine system, and reproduction. Sexually transmitted diseases also will be discussed. Students cannot receive credit for BIOL 2303 if BIOL 1404 or BIOL 1114 is concurrently or previously taken.

**BIOL - 2504 Anatomy & Physiology II, 4.00 Credits**

Prerequisite(s): BIOL 1404 with D or better

Level: Lower

Applied Learning-Other, Course Fee \$17.00, Gen Ed - Natural Sciences, Liberal Arts and Science

This course is a continuation of Anatomy and Physiology I (BIOL 1404). It is a study of the gross and microscopic anatomy of various human systems, emphasizing how structure facilitates function. The areas emphasized are the endocrine, cardiovascular, lymphatic, immune, respiratory, digestive, urinary, and reproductive systems.

**BIOL - 2633 Histotechniques, 3.00 Credits**

Prerequisite(s): BIOL 1104 with D or better or BIOL 1404 with D or better or BIOL 1114 with D or better or ANSC 1214 with D or better or VETS 2014 with D or better

Level: Lower

Course Fee \$129.00

An applied and theoretical technology course which provides instruction and hands-on experiences in the preparation of tissues for microscopic examination by paraffin, and frozen section and smear techniques. Normal and diseased animal and plant tissues will be used to provide the students an opportunity to use a variety of techniques involved in processing tissues. Tissue identification and classification will be discussed as it relates to preparation procedures. Care, maintenance, and use of instrumentation in tissue preparation will be stressed. One-hour lecture and 2 two-hour laboratories per week with significant additional supervised time spent in the lab by students.

**BIOL - 2801 Environmental Sciences Lab, 1.00 Credit**

Prerequisite(s): BIOL 2803 with D or better \*

Level: Lower

Applied Learning-Field Study, Course Fee \$96.00, Liberal Arts and Science

This course is a series of field-oriented laboratory experiences involving analyses of various local ecosystems. Topics to be stressed include identification of organisms, use of environmental monitoring equipment, and collection and interpretation of field data.

**BIOL - 2803 Environmental Science, 3.00 Credits**

Level: Lower

Gen Ed - Natural Sciences, Liberal Arts and Science

This course is an introduction to the science of ecology and the interrelationship between humans and their environment. The physical environment of the Earth's climate, geographic and geologic systems, and the cycling of minerals and water are described. The biology of populations, species, ecosystems and biomes section deals with organisms and their interactions with one another and their environment is discussed. The world's human populations, and their role in the ecosystems is investigated including the history of human populations, current demographic trends, and projected future population parameters. The impacts of human populations on the environment are covered as well.

**BIOL - 2833 Environmental Science, 3.00 Credits**

Level: Lower

Applied Learning-Other, Gen Ed - Natural Sciences, Liberal Arts and Science

This course provides an introduction to the science of ecology and the interrelationship between humans and their environment. The physical environment of the Earth's climate, geographic and geologic systems and the cycling of minerals and water are described. The biology of populations, species, ecosystems and biomes section deals with organisms and their interactions with one another and their environment. The world's human populations and their role in the ecosystems is investigated including the history of human populations, current demographic trends and projected future population parameters. The impacts of human populations on the environment are covered as well. The course also includes a series of field-oriented laboratory experiences involving analyses of various local ecosystems. Topics stressed in the laboratory portion of the class include the identification of organisms, the use of environmental monitoring equipment and the collection and interpretation of field data.

**BIOL - 3403 Essentials - Pathopharmacology, 3.00 Credits**

Prerequisite(s): ( BIOL 1114 with C or better or BIOL 1404 with C or better ) and MEDR 1133 with C or better and ( BIOL 2214 with C or better \* or BIOL 2504 with C or better \* )

Level: Lower

This is a lecture-based online course which introduces students to the basics of pharmacology, pathophysiology, and the pharmacologic agents that are utilized in the treatment of diseases. By the end of the course, students will have been exposed to pathophysiology of the different organ systems (including etiology and symptoms), key concepts of pharmacology, regulatory agencies and legislation, and review of pharmacologic agents utilized to treat specific diseases.

**BIOL - 4254 General Microbiology, 4.00 Credits**

Level: Lower

Applied Learning-Other, Course Fee \$29.00, Gen Ed - Natural Sciences, Liberal Arts and Science

This course is designed to provide an introductory survey to the various microorganisms, prions, viruses, bacteria, protozoans, and multicellular parasites, their structures, physiology, identification, with the various medical and non-medical implications in our daily lives. Lecture topics include prokaryotic cell structure and function, biochemical processes, physical and chemical factors that affect cell growth, classification and identification, physical and chemical methods of control. A major portion of the course deals with the pathogenic properties of microorganisms and the body's defense mechanisms including the functions of the immune systems. Laboratory topics include bacterial culture and staining, metabolism and biochemical reactions, physiological characteristics, patient specimen collection and processing as done in a microbiology laboratory and pathogen identification and antibiotic sensitivity determination.

**BIOL - 4403 Pathophysiology, 3.00 Credits**

Prerequisite(s): BIOL 2504 with C or better \* or BIOL 2214 with C or better \*

Level: Lower

Gen Ed - Natural Sciences, Liberal Arts and Science

This is a lecture-based online course that includes the study of disruptions of normal physiology, processes that bring about these disruptions, and various ways in which the disruptions manifest themselves as symptoms, signs, physical findings, and laboratory findings. The course will explore the pathophysiology of genetic diseases, hypersensitivity and autoimmune diseases, infectious diseases, neoplasia, diseases due to physical and chemical agents, disturbances of fluid and electrolyte balance, and endocrine dysfunction.

**BIOL - 4900 Directed Study, 1.00 TO 6.00 Credits**

Level: Lower

Liberal Arts and Science

A student may contract for one to six credit hours of independent study through an arrangement with an instructor who agrees to direct such a study. The student will submit a plan acceptable to the instructor and to the department chairperson. The instructor and student will confer regularly regarding the progress of the study.

**BIOL - 5003 Genomics, 3.00 Credits**

Prerequisite(s): BIOL 6534 with D or better

Level: Upper

Applied Learning-Practicum, Liberal Arts and Science, Upper Level

This is a project based-learning course that will introduce the students to the emerging science of genomics and its implications for human biology, medicine, social policy and individual life path choices in the 21st century. Our genome is the blueprint that encodes all the information we need to develop from a single cell into a hugely complicated functional organism. This course will instruct students how to use bioinformatics tools to analyze genes and their expression. The course will explore techniques used to study genomes, what information is available, and how this information is used to understand how organisms differ or match; how different organisms evolved; how the genome is constructed and how it operates. In addition the course will examine genome structure and function in terms of our future health and wellbeing. The laboratory portion of the course will enable students to use bioinformatics tools to annotate genes from the bacterium *Kyococcus sedentarius* and to participate in a DNA Barcoding project to catalog living organisms such as <http://www.studentdnabarcoding.org/>.

**BIOL - 5013 Biotechniques, 3.00 Credits**

Prerequisite(s): ( CHEM 2984 with D or better or CHEM 2124 with D or better ) and BIOL 2204 with D or better

Level: Upper

Applied Learning-Practicum, Course Fee \$152.00, Liberal Arts and Science, Upper Level

This course focuses on the development of advanced practical skills, competencies, and knowledge in laboratory techniques commonly used across the biological sciences in research and industry. It is based on a full "hands on" approach where all students undertake a variety of practical exercises derived principally from the areas of DNA science, cellular biology, protein analysis and tissue preparation. This course requires the student to use appropriate professional laboratory protocols that will lead to advanced study and employment.

**BIOL - 5104 Kinesiology, 4.00 Credits**

Prerequisite(s): BIOL 1404 with D or better and BIOL 2504 with D or better

Level: Upper

Upper Level

This course introduces and integrates musculoskeletal anatomy, biomechanics of human motion, and kinesiology. Primary emphasis is placed on functional anatomy of the extremities, head, neck, and trunk. Learning is aided by laboratory experiences utilizing skeletal models, computerized anatomy programs, surface anatomy, palpation, and gross anatomy.

**BIOL - 5223 Ecology, 3.00 Credits**

Prerequisite(s): ( BIOL 1104 with D or better and BIOL 2204 with D or better ) or ( BIOL 1304 with D or better and BIOL 2204 with D or better )

Level: Upper

Liberal Arts and Science, Upper Level

The course will analyze the biotic and abiotic factors that influence or limit distributions of organisms. Emphasis will be placed on population and community biology, including evolution, genetics, behavior, models of population growth, species interactions and community structure. Metabolic and energy relationships at the ecosystem level also will be explored. Examples will be drawn from all Domains and Kingdoms of organisms. Students will be required to evaluate the role of a specific "Keystone" species in an ecosystem and how the loss of that species impacts biodiversity in the ecosystem.

**BIOL - 5254 Principles of Microbiology, 4.00 Credits**

Prerequisite(s): ( BIOL 2204 with C or better or BIOL 2504 with C or better ) or ( VETS 2013 with C or better or VETS 2014 with C or better or VETS 1203 with C or better or VETS 1214 with D or better ) or ( BIOL 1104 with C or better or BIOL 1404 with C or better )

Level: Upper

Applied Learning-Other, Course Fee \$26.00, Liberal Arts and Science, Upper Level

A survey of microorganisms, their structures, physiology, and identification, with the various medical and non-medical implications in our daily lives. Topics include prokaryotic cell structure and function, biochemical processes, physical and chemical factors that affect cell growth, classification and identification, and physical and chemical methods of control. A major portion of the course deals with the pathogenic properties of microorganisms and the body's defense mechanisms including the functions of the immune systems. Laboratory topics include bacterial culture and staining, metabolism and biochemical reactions, physiological characteristics, patient specimen collection and processing as done in a microbiology laboratory and pathogen identification and antibiotic sensitivity determination.

**BIOL - 5900 Directed Study, 1.00 TO 6.00 Credits**

Level: Upper

Upper Level

A student may contract for one to six credit hours of independent study through an arrangement with an instructor who agrees to direct such a study. The student will submit a plan acceptable to the instructor and to the department chairperson. The instructor and student will confer regularly regarding the progress of the study.

**BIOL - 6003 Molecular and Cell Biology, 3.00 Credits**

Prerequisite(s): BIOL 6534 with D or better

Level: Upper

Liberal Arts and Science, Upper Level

This course will provide a firm foundation on the principles of modern molecular and cellular biology. The first half of the course will focus on the molecular structure and function of DNA, RNA and proteins and the tenets of the central dogma of molecular biology. The second half of the course will focus on the fundamental processes that enable cells to grow, move, and communicate as well as introduce the processes underlying tissue formation and cell death. During recitation the students will read and analyze primary journal articles, create a short oral presentation on a topic and submit a short "News and Views" article written for a general audience.

**BIOL - 6113 Diet and Disease, 3.00 Credits**

Prerequisite(s): ( BIOL 1313 with D or better or HLTH 1313 with D or better ) and ( BIOL 2504 with D or better or BIOL 2214 with D or better )

Level: Upper

Liberal Arts and Science, Upper Level

This course is an in-depth exploration of the cause and effect relationship between diet and common disease processes. This course will examine nutritional epidemiology, nutritional intervention and the research that substantiates both. The relationship of nutrition to common maladies, such as: obesity, diabetes mellitus and cancer, will be compared. Additionally, specific disease processes will be evaluated from a nutritional perspective, including: neurodegenerative, cardiovascular; gastrointestinal and bone disease. The course will conclude by determining the nutritional and dietary factors necessary for proper healing and recovery.

**BIOL - 6403 Advanced Pathophysiology, 3.00 Credits**

Prerequisite(s): BIOL 2504 with D or better or BIOL 2214 with D or better

Level: Upper

Liberal Arts and Science, Upper Level

This internet-based course examines abnormal human physiology in a clinical context, with intent to develop specific intellectual skills related to nursing and other allied health professions. Pathophysiology is considered from a systemic perspective, with emphasis given to cellular abnormalities, disruptions of homeostasis, infectious disease, inflammation, and disorders of the blood, immune, cardiovascular, respiratory, digestive, endocrine, neurological, musculoskeletal, integumentary, renal, genitourinary, and reproductive systems. The course concludes with case study presentations to allow students to derive and discuss correlations among clinical healthcare or other related disciplinary settings.

**BIOL - 6534 Genetics, 4.00 Credits**

Prerequisite(s): BIOL 1104 with C or better or BIOL 1304 with C or better or BIOL 1404 with C or better or VETS 1214 with C or better

Level: Upper

Applied Learning-Other, Course Fee \$104.00, Liberal Arts and Science, Upper Level

A study of heredity and the gene from the perspective of the individual, the cell, and the population. The human species will be emphasized along with recent advances in biotechnology. Laboratory work includes Drosophila breeding, polymerase chain reaction, and DNA electrophoresis.

**BIOL - 7723 Research Methods in Health Sci, 3.00 Credits**

Prerequisite(s): BIOL 2204 with C or better and CHEM 4524 with C or better

Level: Upper

Liberal Arts and Science, Upper Level

This course familiarizes the student with laboratory protocols, safety, and experimental design. It covers searching for, reading, writing, and presenting scientific literature. Students also learn skills for exploring and obtaining careers in the health professions.