BIOLOGY (BIOL)

BIOL 2XX: Biology Designated Elective
Credits: 3
College: Jefferson College of Life Sciences
Schedule Type: Lecture

BIOL 3X1: Writing Intensive Elective
Credits: 3
College: Jefferson College of Life Sciences
Schedule Type: Lecture

BIOL 3XX: Designated Elective
Credits: 3
College: Jefferson College of Life Sciences
Schedule Type: Lecture

BIOL 101: Current Topics in Biology
(for non-science majors) Explore contemporary biological topics that you hear and read about or that are part of your daily life and learn the fundamental scientific concepts that underlie them. Topics will cover molecules to cells and organisms to populations as well as inheritance, development, infectious disease and what constitutes well-supported science. The course utilizes projects, hands-on activities, online discussions and group work to illustrate concepts.
Credits: 3
College: Jefferson College of Life Sciences
Schedule Type: Lecture, Lecture/Lab

BIOL 101AC: Current Topics in Biology
(for non-science majors) Explore contemporary biological topics that you hear and read about or that are part of your daily life and learn the fundamental scientific concepts that underlie them. Topics will cover molecules to cells and organisms to populations as well as inheritance, development, infectious disease and what constitutes well-supported science. The course utilizes projects, hands-on activities, online discussions and group work to illustrate concepts.
Credits: 3
College: Jefferson College of Rehabilitation Sciences
Schedule Type: Lab, Lecture, On-Line

BIOL 102: Introduction to Botany
This course will review botanical topics including ecology and diversity, form, growth and reproduction, selective breeding and genetic modification and other newsworthy botanical topics that arise during the semester. These topics provide a foundation for those interested in agriculture and horticulture, plants in nutrition and pharmaceuticals, and alternative energy production. Class time will be a combination of lectures, discussions, hands-on activities, laboratory exercises, and field work. Pre-requisites: none Co-requisites: none
Credits: 3
College: Jefferson College of Life Sciences
Schedule Type: Lab, Lecture, Lecture/Lab

BIOL 103: Biology I
(required for Science majors) The objective of this course is to gain an understanding of the cellular, molecular and genetic basis of life. Students will be introduced to the physical and chemical principles involved in biological processes, the microscopic world of the cell, regulation of gene expression and the laws that govern inheritance. This course and BIOL-104 and BIOL-104L Biology II are the introductory courses for science majors.
Credits: 3
College: Jefferson College of Life Sciences
Corequisites: BIOL 103L
Schedule Type: Lab, Lecture, On-Line

BIOL 103L: Biology I Lab
This laboratory course reinforces the understanding of cellular, molecular and genetic processes learned in Biology I lecture. Exercises include microscopic examination of cells and tissues, biochemical analysis of enzyme activity, osmosis, cellular respiration and genetic investigation, including electrophoretic analysis of mutation.
Credits: 1
College: Jefferson College of Life Sciences
Corequisites: BIOL 103
Schedule Type: Lab, On-Line

BIOL 104: Biology II
(for science majors) In this course students will apply the principles learned in Biology I to the structure and function of organisms. Physiological processes that will be examined include nutrition, gas exchange, transport and regulation of body fluids, chemical and nervous control, and reproduction.
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: (BIOL 103 and BIOL 103L) or (BIOL 112 and BIOL 112L) [Min Grade: C-]
Corequisites: BIOL 104L
Schedule Type: Lecture, On-Line

BIOL 104L: Biology II Lab
(for science majors) In this course students will apply the principles learned in Biology I to the structure and function of organisms. Physiological processes that will be examined include nutrition, gas exchange, transport and regulation of body fluids, chemical and nervous control, and reproduction.
Credits: 1
College: Jefferson College of Life Sciences
Prerequisites: (BIOL 103 and BIOL 103L) or (BIOL 112 and BIOL 112L) [Min Grade: C-]
Corequisites: BIOL 104
Schedule Type: Lab, On-Line

BIOL 105: Environmental Issues
In this course, students will explore the ecological, chemical, social, economic and political implications of critical global environmental issues including water pollution, pesticides, energy, acid rain, global warming, waste management, biodiversity loss and population growth. Alternative solutions proposed to address these experimental issues will be explored from multiple perspectives
Credits: 3
College: Jefferson College of Life Sciences
Schedule Type: Lecture

BIOL 107: Science, Art, and Society
This course will explore the interconnections of science with the arts across various subfields of the Biological Sciences, including contemporary and historical examples. The course's scientific subject matter will be organized around the theme of "Patterns and Trends". The course will begin by describing the general process of how patterns and trends are identified and described in science and move on to specific examples from a variety of biological fields including climate science, plant and animal development, neurobiology, and genetics. Each scientific example will be placed in a social context that emphasizes how society uses that scientific knowledge for the purpose of interpreting the world around them and for predicting the future. Finally, we will explore how the citizen science and SciArt communities integrate scientific knowledge with artistic and social endeavors. The course will culminate with a student created SciArt project and exhibition.
Credits: 3
College: Jefferson College of Life Sciences
Schedule Type: Lecture

BIOL 110: Human Anatomy & Physiology I
Credits: 3
College: Jefferson College of Health Professions
Schedule Type: Lab, Lecture, On-Line

BIOL 111: Human Anatomy & Physiology II
Credits: 3
College: Jefferson College of Health Professions
Prerequisites: BIOL 110 [Min Grade: D]
Schedule Type: Lab, Lecture, On-Line

BIOL 112: Core Concepts of Biology
Students in this course will gain a working knowledge of the core concepts of biology necessary for further studies in biology and the health sciences. These concepts include the relationship of structure and function across scales of biological organization, the flow of energy and information through biological systems, and an introduction to animal physiology in a systems context. This course is the introductory course for students in the health sciences and is a prerequisite for BIOL 201 and 202.
Credits: 3
College: Jefferson College of Life Sciences
Corequisites: BIOL 112L
Schedule Type: Lecture, On-Line

BIOL 112L: Core Concepts of Biol Lab
This laboratory course reinforces the understanding of cellular, molecular and genetic processes learned in Biology 112 lecture. Exercises include microscopic examination of cells and tissues, biochemical analysis of enzyme activity, osmosis, cellular respiration and genetic investigation, including electrophoretic analysis of mutation.
Credits: 1
College: Jefferson College of Life Sciences
Corequisites: BIOL 112
Schedule Type: Lab, On-Line

BIOL 113: Human Anatomy & Physio I Lab
Credits: 1
College: Jefferson College of Health Professions
Prerequisites: BIOX 110 [Min Grade: D]
Schedule Type: Lab, On-Line

BIOL 114: Human Anatomy & Physio II Lab
Credits: 1
College: Jefferson College of Health Professions
Schedule Type: Lab, On-Line

BIOL 120: Concepts in Biology
This survey course assists students in understanding the basic and unifying principles of life. Students focus on a wide variety of topics including structure and function, organization, diversity, biochemistry, evolution, behavior, ecology, and population dynamics.
Credits: 3
College: Jefferson College of Health Professions
Schedule Type: Lecture, On-Line

BIOL 121: Biology I
(required for Science majors) The objective of this course is to gain an understanding of the cellular, molecular and genetic basis of life. Students will be introduced to the physical and chemical principles involved in biological processes, the microscopic world of the cell, regulation of gene expression and the laws that govern inheritance. This course and BIOL-104 and BIOL-104L Biology II are the introductory courses for science majors.
Credits: 3
College: Jefferson College of Health Professions
Schedule Type: Lecture, On-Line

BIOL 122: Biology I Lab
This laboratory course reinforces the understanding of cellular, molecular and genetic processes learned in Biology I lecture. Exercises include microscopic examination of cells and tissues, biochemical analysis of enzyme activity, osmosis, cellular respiration and genetic investigation, including electrophoretic analysis of mutation.
Credits: 1
College: Jefferson College of Health Professions
Schedule Type: Lab, On-Line

BIOL 123: Biology II
Credits: 3
College: Jefferson College of Health Professions
Schedule Type: Lecture, On-Line

BIOL 124: Biology II Lab
Credits: 1
College: Jefferson College of Health Professions
Schedule Type: Lab, On-Line

BIOL 201: Human Anatomy and Physiology I
This course is the first of a two-semester sequence. This course will examine anatomical and physiological aspects of the following systems of humans: tissues, integumentary, musculoskeletal and neurologic. A close correlation between lecture and laboratory topics will be maintained. During lecture, both anatomy and physiology will be discussed however greater emphasis will be placed on the physiology of each system while during the laboratory session, greater emphasis will be placed on anatomy.
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: (BIOL 104 and BIOL 104L) or (BIOL 112 and BIOL 112L) [Min Grade: C-]
Corequisites: BIOL 201L
Schedule Type: Lecture, On-Line

BIOL 201L: Human Anat & Physiology I Lab
The A&P laboratory sessions will provide students with hands-on learning opportunities to help conceptualize content discussed in lecture. During lab, students will work on problem sets, examine and dissect organs and/or anatomical models, use microscopes, perform basic physiological experiments and examine cadaver specimens. During laboratory sessions of the first half of this two-semester course, emphasis will be placed on the anatomy of the relevant system.
Credits: 1
College: Jefferson College of Life Sciences
Prerequisites: (BIOL 104 and BIOL 104L) or (BIOL 112 and BIOL 112L) [Min Grade: C-]
Corequisites: BIOL 201
Schedule Type: Lab, On-Line

BIOL 202: Human Anatomy & Physiology II
This course is the second of a two semester sequence. This course will examine anatomical and physiological aspects of the following systems of humans: sensory, endocrine, circulation, respiration, nutrition-digestion, excretion and reproductive. During lecture, both anatomy and physiology will be discussed. While some lab sessions will focus mainly on the anatomy of the current system, most laboratory sessions will involve physiological experiments to provide students with greater insight into the physiology of the current system. A close correlation between lecture and laboratory topics will be maintained.
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: BIOL 201 and BIOL 201L [Min Grade: C-]
Corequisites: BIOL 202L
Schedule Type: Lecture, On-Line

BIOL 202L: Human Anat & Physiology II Lab
The A&P laboratory sessions will provide students with hands-on learning opportunities to help conceptualize content discussed in lecture. During lab, students will work on problem sets, examine and dissect organs and/or anatomical models, use microscopes, perform basic physiological experiments and examine cadaver specimens. While some lab sessions will focus mainly on the anatomy of the current system, most laboratory sessions will involve physiological experiments to provide students with greater insight into the physiology of the current system.
Credits: 1
College: Jefferson College of Life Sciences
Prerequisites: BIOL 201 and BIOL 201L [Min Grade: C-]
Corequisites: BIOL 202
Schedule Type: Lab, On-Line

BIOL 204: Cell Biology
This course focuses on both structure and function of cellular components. Cellular structure is investigated from the molecular level to macromolecular assemblies and organelles with the major emphasis on how these structures function to form a dynamic cell interacting with its environment. Cell growth, reproduction and communication are discussed. Cells studies include single cells to those organized into tissues in multicellular organisms.
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: BIOL 104 and BIOL 104L [Min Grade: C-]
Corequisites: BIOL 204L
Schedule Type: Lecture

BIOL 204L: Cell Biology Lab
Credits: 1
College: Jefferson College of Life Sciences
Prerequisites: BIOL 104 and BIOL 104L [Min Grade: C-]
Corequisites: BIOL 204
Schedule Type: Lab

BIOL 205: Plant Biology
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: BIOL 104 and BIOL 104L [Min Grade: C-]
Corequisites: BIOL 205L
Schedule Type: Lecture

BIOL 205L: Plant Biology Lab
Credits: 1
College: Jefferson College of Life Sciences
Prerequisites: BIOL 104 and BIOL 104L [Min Grade: C-]
Corequisites: BIOL 205
Schedule Type: Lab

BIOL 207: Principles of Genetics
This course will consider Mendelian genetics and the contributions of other early research on our present knowledge. Included will be crossover consequences, gene mapping, sex linkage, statistical genetics, mutation, chromosome abnormalities and human genetics.
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: (BIOL 104 and BIOL 104L) or (BIOL 112 and BIOL 112L) [Min Grade: C-]
Corequisites: BIOL 207L
Schedule Type: Lecture

BIOL 207L: Principles of Genetics Lab
This is the laboratory course which must be taken to complete the genetics requirement. The laboratory exercises use current techniques of DNA technology as applied to disease diagnosis, forensic determinations and the isolation and structural examination of the DNA molecule.
Credits: 1
College: Jefferson College of Life Sciences
Prerequisites: (BIOL 104 and BIOL 104L) or (BIOL 112 and BIOL 112L) [Min Grade: C-]
Corequisites: BIOL 207
Schedule Type: Lab

BIOL 208: Biodiversity
The purpose of this course is to explore what is known about the abundance and distribution of all species on earth, what threatens and supports these species and what efforts humans have taken both in the United States and globally to destroy and conserve biodiversity. Genetic variability, demographic and population dynamics, environmental variation, economic value and legal status will be compared for the design of captive breeding programs, protected areas management and sustainable use alternatives.
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: BIOL 104 and BIOL 104L [Min Grade: C-]
Schedule Type: Lecture

BIOL 209: Medicinal Plants
This writing-intensive course focuses on the use of plants and plant products in human health. Topics include a survey of plants and plant families with medicinal properties, their cultivation and conservation, physiological effects of plant extracts, plantderived drugs, historical and cultural aspects of medicinal plant use.
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: (BIOL 104 Min Grade: C- and BIOL 104L Min Grade: C-) or (BIOL 112 Min Grade: C- and BIOL 112L Min Grade: C-) and (WRIT 201 Min Grade: D or WRIT 202 Min Grade: D or WRIT 211 Min Grade: D or WRIT 215 Min Grade: D or WRIT 217 Min Grade: D)
Corequisites: BIOL 209L
Schedule Type: Lab, Lecture, Lecture/Lab

BIOL 209L: Medicinal Plants Lab
Credits: 1
College: Jefferson College of Life Sciences
Corequisites: BIOL 209
Schedule Type: Lab

BIOL 221: Microbiology
This course provides an introduction to environmental, industrial, food and medical microbiology. An understanding of the methods by which microbes produce disease as well as interact with body surfaces to maintain human health is also discussed. [Writing Intensive]
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: (BIOL 104 and BIOL 104L) or BIOL 112 and BIOL 112L [Min Grade: C-]
Corequisites: BIOL 221L
Schedule Type: Hybrid, Lecture, On-Line

BIOL 221L: Microbiology Lab
Laboratories are designed to complement and expand information from lectures. Students will gain experience in classical techniques used by environmental and clinical microbiologists for determining unknown bacteria and molds. Practical studies will also compare historical and current methods for physical and chemical removal of microbes.
Credits: 1
College: Jefferson College of Life Sciences
Prerequisites: (BIOL 104 and BIOL 104L) or (BIOL 112 and BIOL 112L) [Min Grade: C-]
Corequisites: BIOL 221
Schedule Type: By Appointment - 4 students, Lab, On-Line

BIOL 256: Molecular Genetics
This lecture/lab course reviews the structure and function of the macromolecules that manifest genetic information. Topics include DNA and chromatin structure, replication, recombination, repair, RNA structure transcription, regulation of transcription and downstream processes and current investigative technologies. The lab enables students to have hands-on experience with handling and analysis of macromolecules. Students prepare lab reports and seminar presentations typical of real-world dissemination methods. Prerequisite: grade of "C-" or better in BIOL 104 and BIOL 104L
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: BIOL 104 and BIOL 104L [Min Grade: C-]
Corequisites: BIOL 256L
Schedule Type: By Appointment - 1 student, By Appointment - 2 students, By Appointment - 3 students, Lecture

BIOL 256L: Molecular Genetics Lab
This lecture/lab course reviews the structure and function of the macromolecules that manifest genetic information. Topics include DNA and chromatin structure, replication, recombination, repair, RNA structure transcription, regulation of transcription and downstream processes and current investigative technologies. The lab enables students to have hands-on experience with handling and analysis of macromolecules. Students prepare lab reports and seminar presentations typical of real-world dissemination methods.
Credits: 1
College: Jefferson College of Life Sciences
Prerequisites: BIOL 104 and BIOL 104L [Min Grade: C-]
Corequisites: BIOL 256
Schedule Type: By Appointment - 1 student, By Appointment - 3 students, Lab

BIOL 299: Biology Transfer
Credits: 3
College: Jefferson College of Life Sciences
Schedule Type: Lecture

BIOL 301: Ecology
This course quantitatively measures the relationship between organisms and their environment at the population, community, landscape and global level. Critical ecological controversies will be explored. Field data for both flora and fauna will be collected, analyzed and presented following guidelines from professional scientific journals.
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: BIOL 104 and BIOL 104L [Min Grade: C-]
Corequisites: BIOL 301L
Schedule Type: Lab, Lecture, Lecture/Lab

BIOL 301L: Ecology Lab
Credits: 1
College: Jefferson College of Life Sciences
Prerequisites: BIOL 104 and BIOL 104L [Min Grade: C-]
Corequisites: BIOL 301
Schedule Type: Hybrid, Lab

BIOL 302: Medical Genetics
The course in medical genetics deals with the definition of the role of genetic variation and mutation in predisposing to disease, modifying the course of disease, or causing the disease itself. It will cover single gene defects caused by a critical error in the information carried by a single gene, diseases due to an excess or deficiency of the genes contained in whole chromosomes or segments of chromosomes, and multifactorial inheritance diseases which result of more than one genes which can act together to produce or predispose to a serious defect. The course will also introduce the method collection and interpretation of a family history as an integral tool in medical genetics, and integrate this in all aspects of the presentation.
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: BIOL 207 Min Grade: D and BIOL 207L Min Grade: C-
Schedule Type: Lecture

BIOL 303: Histology
Histology provides students with an integrated perspective of how adaptations in physiology, biochemistry and morphology allow cellular organization into human organs and support systems. Laboratory studies will introduce students to abnormal embryology, which is the core of many aspects of disease, especially those affecting children. As well as analysis of prepared slides, students will learn to interpret and present abnormal histology/embryology in the form of case histories.
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: BIOL 202 Min Grade: D and BIOL 202L Min Grade: C-
Corequisites: BIOL 303L
Schedule Type: Lab, Lecture, Lecture/Lab

BIOL 303L: Histology Lab
Credits: 1
College: Jefferson College of Life Sciences
Prerequisites: BIOL 202 Min Grade: D and BIOL 202L Min Grade: C-
Corequisites: BIOL 303
Schedule Type: Lab

BIOL 305: Preventative Medicine
This upper-level biology elective course examines the scientific, physiological, behavioral and policy dynamics associated with preventative medicine and effective outreach to different patient populations. Students will design experiments to measure their own prevention practices in a series of hands-on interactive laboratory exercises while comparing their results to national level demographic, epidemiological, historical trends and current intervention alternatives for the nation's leading health issues. Client case studies will be used to engage students in problem-solving scientifically sound interventions that examine the environmental, socio-cultural, behavioral, and biological determinants of success preventative practices.
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: PSYC 103 Min Grade: C or (BIOL 104 Min Grade: C- and BIOL 104L Min Grade: C-) or (BIOL 112 Min Grade: C- and BIOL 112L Min Grade: C-)
Corequisites: BIOL 305L
Schedule Type: Hybrid, Lab, Lecture, Lecture/Lab

BIOL 305L: Preventative Medicine Lab
This laboratory experience supports evaluation of the demographic, epidemiological and historical trends to intervention of the nation's leading health issues with hands-on measurements, analysis, synthesis and comparison to current environmental, socio-cultural, behavioral, and biological norms for whole person healthcare.
Credits: 1
College: Jefferson College of Life Sciences
Corequisites: BIOL 305
Schedule Type: Hybrid, Lab

BIOL 307: Developmental Genetics
This course is an elective for students who have completed BIOL 104/104L and required for those in the genetics minor.It will consider animal embryology from gametogenesis (of sperm and egg) to organogenesis (development of organs) and specification with emphasis placed the genes controlling these processes. The course includes cytogenesis (development of cells) and morphogenesis(genes which control change in body form) of the developing embryo.
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: BIOL 104 and BIOL 104L [Min Grade: C-]
Schedule Type: Lab, Lecture

BIOL 308: Tropic Field Studies Costa Ri
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: BIOL 104 and BIOL 104L [Min Grade: C-]
Schedule Type: Lab, Lecture, Study Abroad

BIOL 309: App in Molecular Bio/Bioinform
In this upper level biology course students will take a hands-on approach to applied molecular biology and genetics. In the first part of the semester students will learn to extract, amplify, and sequence DNA from a target organism. In the second half of the class students will apply bioinformatics techniques to characterize and analyze their sequences with the tools of bioinformatics. Along the way students will be introduced to numerous additional techniques in applied molecular biology.
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: BIOL 104 Min Grade: C- and BIOL 104L Min Grade: C- and CHEM 104 Min Grade: D and CHEM 104L Min Grade: D
Corequisites: BIOL 309L
Schedule Type: Hybrid, Lecture, On-Line

BIOL 309L: App in Molecular Bio/Bioin Lab
The laboratory component of Applications in Molecular Biology and Bioinformatics. In the laboratory component of this course students will spend time in the biology laboratory and working in the computer lab. This lab is closely integrated with the lecture activities.
Credits: 1
College: Jefferson College of Life Sciences
Prerequisites: BIOL 104 Min Grade: C- and BIOL 104L Min Grade: C- and CHEM 104 Min Grade: D and CHEM 104L Min Grade: D
Corequisites: BIOL 309
Schedule Type: Hybrid, Lab, Online Lab

BIOL 311: Applic in Molec Bio & Bioinfor
This course is an upper-level elective for Biology majors and may count towards the Genetics minor. Other students who have completed General Biology and General Chemistry may also take this course. To get the most out of this course, it is suggested that students complete Principles of Genetics (BIOL 207) or Molecular Genetics (BIOL 256).
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: BIOL 104 and BIOL 104L and CHEM 104 and CHEM 104L and BIOL 311L [Min Grade: C-]
Schedule Type: Lecture

BIOL 311L: Applic in Molec Bio & Bioinfor
The laboratory component of Applications in Molecular Biology and Bioinformatics. In the laboratory component of this course students will spend time in the biology laboratory and working in the computer lab. This lab is closely integrated with the lecture activities.
Credits: 1
College: Jefferson College of Life Sciences
Prerequisites: BIOL 104 and BIOL 104L and CHEM 104 and CHEM 104L and BIOL 311 [Min Grade: C-]
Schedule Type: Lab

BIOL 312: Biostatistics
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: MATH 111 or MATH 112 [Min Grade: C]
Schedule Type: Lecture

BIOL 315: Microbiology Lecture
(writing intensive) The objective of this course is to introduce students to the innate mechanisms by which the human body prevents infection, as well as those involved in specifically acquired immunity. Topics include the structural, functional and genetic aspects of a fully competent immune system that can successfully prevent attack by millions of microorganisms each day. Exploration of the many medical conditions which result from hyperactive- or impaired-immune responses including allergy, autoimmunity, cancer and AIDS are studied.
Credits: 3
College: Jefferson College of Health Professions
Schedule Type: By Appointment - 1 student, Lecture, On-Line

BIOL 316: Microbiology Lab
Credits: 1
College: Jefferson College of Health Professions
Schedule Type: By Appointment - 1 student, Lab, On-Line

BIOL 317: Experimental Field Ecology
Credits: 4
College: Jefferson College of Life Sciences
Prerequisites: BIOL 301 and BIOL 301L [Min Grade: D]
Schedule Type: Lab, Lecture

BIOL 318: Urban Ecology, Restor&Planning
Natural lands and natural systems occur in densely populated areas and because of the human impacts present vast challenges to the landscape architects and environmental planners who are entrusted with their protection and enhancement. This course studies in detail urban ecological systems, and the human impacts that shape them. The student will also be exposed to current restoration techniques, which are being utilized in the urban setting to restore natural ecological functioning to the city.
Credits: 3
College: Jefferson College of Humanities & Sciences
Prerequisites: BIOL 104 and BIOL 104L [Min Grade: C-]
Schedule Type: Lecture

BIOL 319: Oceanography
An introduction to the biological, chemical, geological and physical aspects of the ocean environment with particular emphasis on the importance of the oceans to human beings and the impact we have on them. Students may participate in an optional field trip highlighting estuarine/coastal biodiversity, aquacultural techniques and oceanographic sampling techniques.
Credits: 3
College: Jefferson College of Humanities & Sciences
Prerequisites: SCI 101 or SCI 102 or BIOL 101 or BIOL 103 or CHEM 101 or CHEM 103 or PHYC 101 or PHYC 201 [Min Grade: D]
Schedule Type: By Appointment - 1 student, Lecture

BIOL 320: Intro to Biotechnology
This course is an introduction to the field of biotechnology, one of the major technologies of the twenty-first century. Its wide-ranging, multi-disciplinary activities include recombinant DNA techniques, cloning, and the application of microbiology to the production of goods from bread to antibiotics. This course introduces both the principles and applications of Recombinant DNA technology to animals, plants and microbial organisms. Basic biotechnology, biology and bioprocessing topics will be combined to provide a complete overview of biotechnology. Students engage in ethical debate surrounding biotechnology. Students review employment and careers in the biotechnology and biopharmaceutical industries.
Credits: 4
College: Jefferson College of Life Sciences
Prerequisites: (CHEM 104 Min Grade: D and CHEM 104L Min Grade: D) and (BIOL 104 Min Grade: C- and BIOL 104L Min Grade: C-)
Schedule Type: Lab, Lecture

BIOL 321: Immunology
(writing intensive) The objective of this course is to introduce students to the innate mechanisms by which the human body prevents infection, as well as those involved in specifically acquired immunity. Topics include the structural, functional and genetic aspects of a fully competent immune system that can successfully prevent attack by millions of microorganisms each day. Exploration of the many medical conditions which result from hyperactive- or impaired-immune responses including allergy, autoimmunity, cancer and AIDS are studied.
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: (BIOL 104 Min Grade: C- and BIOL 104L Min Grade: C-) or (BIOL 112 Min Grade: C- and BIOL 112L Min Grade: C-) and (WRIT 201 Min Grade: D or WRIT 202 Min Grade: D or WRIT 217 Min Grade: D)
Schedule Type: Lecture

BIOL 321L: Immunology Lab
Credits: 1
College: Jefferson College of Life Sciences
Schedule Type: Lab

BIOL 322: Wildlife Ecology& Conservation
This course is an international overview of current strategies used for wildlife conservation of mammals, birds, fish and other vertebrate species. Population ecology, habitat, disease, foraging and behavior will be covered in depth. Students will research the historical, legal and economic foundation for current best-management practices. Through intensive field studies, students will compare and contrast scientific-field techniques used in wildlife management.
Credits: 4
College: Jefferson College of Life Sciences
Prerequisites: BIOL 104 [Min Grade: C-]
Schedule Type: Lab, Lecture, Lecture/Lab

BIOL 371: Selected Topics in Biology
This course provides an opportunity to explore topics in biology not developed in other courses. Examples include specialized areas of organismal biology, conservation biology, developmental and molecular biology. Students may take this course more than once as the topics differ each time it is offered.
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: (BIOL 104 and BIOL 104L) or (BIOL 112 and BIOL 112L) [Min Grade: C-]
Schedule Type: Hybrid, Lab, Lecture, Lecture/Lab

BIOL 371L: Selected Topics in Bio Lab
Credits: 1
College: Jefferson College of Life Sciences
Prerequisites: BIOL 371
Schedule Type: Lab

BIOL 391: Research in Biology I
Independent research is taken under the guidance of a faculty member. The research will include a written proposal prior to initiation of the project, a literature search, experimental work, a written abstract and report upon completion of the semester and an oral presentation of the work. Guidelines for approval and for final evaluation are available in the College of Life Sciences office.
Credits: 3
College: Jefferson College of Life Sciences
Schedule Type: By Appointment - 1 student, By Appointment - 2 students, By Appointment - 3 students, By Appointment - 4 students, By Appointment - 5 students, Independent Study

BIOL 392: Research in Biology II
Continuation of BIOL-391.
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: BIOL 391 [Min Grade: D]
Schedule Type: By Appointment - 1 student, By Appointment - 2 students, By Appointment - 3 students, Independent Study

BIOL 398: Biology Designated Elective
Credits: 3
College: Jefferson College of Life Sciences
Schedule Type: Lecture

BIOL 400: Kaplan MCAT Prep Course
Credits: 0
College: Jefferson College of Life Sciences
Schedule Type: Lecture, On-Line

BIOL 402: Genetics Seminar
This writing intensive course will expose the student to the fields of population genetics and several emerging and important subdisciplines (behavioral, conservation, and evolutionary genetics). Human health will be a recurring theme. The seminar format will encourage an independent learning experience. Papers and presentations will build research, communication, and critical thinking skills. [Writing Intensive]
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: (BIOL 207 and BIOL 207L) and (WRIT 211 or WRIT 215 or WRIT 201 or WRIT 202) [Min Grade: D]
Schedule Type: By Appointment - 1 student, By Appointment - 2 students, By Appointment - 3 students, By Appointment - 4 students, By Appointment, Lecture, On-Line

BIOL 404: Neuroscience and Anatomy
This course will guide the student through the working dynamics of the nervous system at chemical, cellular, and anatomic levels. The connections to disease states, behavioral health, and our clinical intervention methods will be a recurring theme. Learning assessment tools will include exams, research papers, and presentations. Models and radiological images will substitute for dissection and preserved specimens.
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: BIOL 202 and BIOL 202L [Min Grade: B-]
Schedule Type: Lecture

BIOL 405: Human Gross Anatomy
This is a gross anatomy course that will be taught using a regional approach. Five major regions of the body (back, arm, leg, thorax and abdominopelvic, and head and neck regions) will be covered each semester, with each body region being a unit in the course. Each unit will start with the bones of that particular region, then muscles, articulations, nerves, arteries and veins. For the units covering the thorax and abdomen and head and neck, organ systems will be discussed. When applicable, the anatomical basis for common conditions (herniated discs, bulging discs, carpal tunnel syndrome, sciatic etc.) will be discussed to show real world applications for the content being discussed.
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: BIOL 201 and BIOL 201L and BIOL 202 and BIOL 202L [Min Grade: B]
Corequisites: BIOL 405L
Schedule Type: Lecture

BIOL 405L: Human Gross Anatomy Lab
This laboratory course supplements the BIOL 405 lecture course with hands on learning using cadaveric remains and virtual cadavers. Bones, muscles, arteries, veins, nerves, and organ systems will be studied using a regional approach. Pre-requisites: BIOL 201 and BIOL 201L and BIOL 202 and BIOL 202L with a minimum grade of B. Co-requisite: BIOL 405.
Credits: 1
College: Jefferson College of Life Sciences
Prerequisites: (BIOL 201 and BIOL 201L) and (BIOL 202 and BIOL 202L) [Min Grade: B]
Corequisites: BIOL 405
Schedule Type: Lab

BIOL 407: Comparative Vertebrate Anatomy
A comparative study of the structure, function and evolutionary relationships of the major vertebrate groups.
Credits: 4
College: Jefferson College of Life Sciences
Prerequisites: BIOL 104 and BIOL 104L [Min Grade: C-]
Schedule Type: Lab, Lecture

BIOL 409: Cellular Analysis
This course will teach fundamental methods of contemporary cellular and biotechnology. Laboratory exercises focus on microscopic, biochemical and molecular analysis of cells and cell structures.
Credits: 4
College: Jefferson College of Life Sciences
Prerequisites: BIOL 204 and BIOL 204L [Min Grade: D]
Schedule Type: Lab, Lecture

BIOL 411: Life Science Seminar
The course covers recent advances in the biological and medical sciences by way of formal presentations and discussions involving both students and invited faculty. In addition, students will learn techniques for the preparation of a research project involving a literature search. Students will be required to carry out a research project and present a formal seminar on this work to their peers.
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: BIOL 104 and BIOL 104L [Min Grade: C-]
Schedule Type: Lecture

BIOL 413: Pathology
Pathology represents an integrated perspective of how disease results from a series of common, underlying changes resulting from initial and continued cell stresses. Students will relate disease processes to the symptoms and signs reported by patients and interpreted by physicians through the use of case history presentation and will acquire a variety of light microscopy techniques routinely used in hospitals for the diagnosis and monitoring of abnormal pathology.
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: BIOL 202 and BIOL 202L [Min Grade: D]
Corequisites: BIOL 413L
Schedule Type: Hybrid, Lab, Lecture, Lecture/Lab

BIOL 413L: Pathology Lab
Pathology represents an integrated perspective of how disease results from a series of common, underlying changes resulting from initial and continued cell stresses. Students will relate diseases processes to the symptoms and signs reported by patients and interpreted by physicians through the use of case history presentation and will acquire a variety of light microscopy techniques routinely used in hospitals for the diagnosis and monitoring of abnormal pathology.
Credits: 1
College: Jefferson College of Life Sciences
Corequisites: BIOL 413
Schedule Type: Lab

BIOL 415: Natural Resource Management
This course explores the existing state of the world's natural resources including forests, fisheries, rangeland, soil, water, wildlife, air and energy. Management options for each resource will be explored in depth. Field trips will compare cost, impact and implementation of different approaches used by environmental agencies. Students will write and present a resource-management plan for a key issue.
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: BIOL 301 and BIOL 301L [Min Grade: D]
Schedule Type: Lecture

BIOL 416: Advanced Physiology
Credits: 3
College: Jefferson College of Life Sciences
Prerequisites: BIOL 202 or BIOL 207 or BCHM 313 [Min Grade: C]
Corequisites: BIOL 416L
Schedule Type: Lecture

BIOL 416L: Advanced Physiology Lab
Credits: 1
College: Jefferson College of Life Sciences
Prerequisites: BIOL 202 or BIOL 207 or BCHM 313 [Min Grade: C]
Corequisites: BIOL 416
Schedule Type: Lab

BIOL 417: Science Seminar
Credits: 3
College: Jefferson College of Life Sciences
Schedule Type: Lecture

BIOL 493: Preceptorship I
The preceptorship experience is designed to enhance the student? s knowledge, technical skills and problem-solving abilities within the biomedical science realm. These studies will be performed off campus under the supervision of biomedical professionals and other practitioners in the medical sciences, previously approved by the program director. Designed to be taken as summer classes between the sophomore and junior years. A minimum of 54-hours required, preferably as six, one-week periods of nine hours per week.
Credits: 3
College: Jefferson College of Life Sciences
Schedule Type: Internship 3 Credits, Lecture, On-Line

BIOL 494: Preceptorship II
The preceptorship experience is designed to enhance the student? s knowledge, technical skills and problem-solving abilities within the biomedical science realm. These studies will be performed off campus under the supervision of biomedical professionals and other practitioners in the medical sciences, previously approved by the program director. Designed to be taken as summer classes between the sophomore and junior years. A minimum of 54-hours required, preferably as six, one-week periods of nine hours per week.
Credits: 3
College: Jefferson College of Life Sciences
Schedule Type: Internship 3 Credits, Lecture, On-Line