

# Biology (BIOL)

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## Courses

### **BIOL 110 Nutrition for Life (2 Hours)**

Designed for students who wish to apply nutrition information to their lives, this course explores how food selection affects body size, body composition, performance, disease resistance, impact on the environment, and longevity. Students will analyze the composition of their diets and develop a plan of action to improve their eating behaviors. This course integrates sustainability concepts. 2 hrs. lecture/wk.

### **BIOL 115 Natural History of Kansas (3 Hours)**

Natural History of Kansas describes physical and biological processes that have led to the present Kansas landscape. Physical science topics include geology, climate patterns and soil formation. Biological science topics include ecology and a survey of the plants and animals of Kansas. The course will consider how the physical and biological environment relates to past and present human resource uses. 3 hrs. lecture/wk.

### **BIOL 121 Introductory Biology for Non-Majors (4 Hours)**

This course introduces non-majors to selected concepts and principles that form the foundation of an understanding of how biological systems operate. The importance of scientific methods and processes will be explored. Biological systems will be investigated at a variety of levels, from the chemical to the biosphere, and the unity of diversity of life will be examined in light of evolutionary and genetic processes. 3 hrs. lecture & 2 hrs. instructional lab/wk.

### **BIOL 124 Oceanus: Essentials of Oceanography (3 Hours)**

This course for beginning students focuses on the marine environment as a unique feature of the planet earth and investigates areas of intense scientific and public concern: the pervasiveness of the ocean and its effect on the earth's weather, its stunning physical size and diversity of contained life forms, its contributions to the physical and historical development of man, its impact on geopolitical and economic matters, and the impact of oceanic pollutants and the potential exploitation of marine resources. 3 hrs. lecture/wk.

### **BIOL 125 General Botany (5 Hours)**

This is a survey of the life, growth and structure of plants. Divisions of the plant kingdom will be presented with emphasis on life cycles, anatomy, physiology and ecology of major groups. Students will do microscopic and macroscopic analysis of the major division. 7 hrs. integrated lecture/lab/wk.

### **BIOL 125H HON: General Botany\* (1 Hour)**

**Prerequisites:** Honors department approval.

One-credit hour honors contract is available to qualified students who have an interest in a more thorough investigation of a topic related to this subject. An honors contract may incorporate research, a paper, or project and includes individual meetings with a faculty mentor. Student must be currently enrolled in the regular section of the courses or have completed it the previous semester. Contact the Honors Program Office, COM 201, for more information.

### **BIOL 127 General Zoology (5 Hours)**

This is a survey of the life, structure, and growth of animals. Students will concentrate on identifying animals by their structural characteristics and looking at the role adaptation plays in anatomical and physiological features. Students will do dissections and microscopic analysis of the major phyla. 7 hrs. integrated lecture/lab/wk.

### **BIOL 130 Environmental Science (3 Hours)**

Environmental Science seeks to describe problems and solutions associated with human use of natural resources. Students will study the major physical and biological processes that govern the complex interactions in natural ecosystems. Major course topics include human population growth, resource use and pollution. Practical solutions aimed at sustainability will be identified and examined. This is an introductory, nonscience-major survey course. 3 hrs./wk.

### **BIOL 130H HON: Environmental Science\* (1 Hour)**

**Prerequisites:** Honors department approval.

One-credit hour honors contract is available to qualified students who have an interest in a more thorough investigation of a topic related to this subject. An honors contract may incorporate research, a paper, or project and includes individual meetings with a faculty mentor. Student must be currently enrolled in the regular section of the courses or have completed it the previous semester. Contact the Honors Program Office, COM 201, for more information.

### **BIOL 131 Environmental Science Lab\* (1 Hour)**

**Prerequisites or corequisites:** BIOL 130.

In this lab, students will learn ecological principles that are necessary for understanding and solving environmental problems. Students will sample the local environment for various types of environmental pollution, conduct lab projects and computer simulations, and attend field trips. Field trips may include a visit to a local wastewater treatment plant, a stream ecosystem and a prairie ecosystem. 2 hrs.lab/wk. plus up to three field trips. BIOL 131 students must be currently enrolled in BIOL 130 or have successfully completed BIOL 130 within the last three years.

**BIOL 132 Introduction to Public Health (3 Hours)**

This is an introductory course in public health. It provides a background in many areas of public health with an emphasis on the health system and understanding and measuring health, disease and illness. Epidemiology, food safety and animal health will also be examined. Public health emergency preparedness, the public health workforce and public health administration will also be studied. Students will learn about public health nursing, public health education and the role of law and government in public health. Students will also examine environmental and occupational health. The different types of public health professional occupations and future challenges for public health will be examined. 3 hrs lecture/wk.

**BIOL 132H HON: Introduction to Public Health\* (1 Hour)**

**Prerequisites:** Honors department approval.

One-credit hour honors contract is available to qualified students who have an interest in a more thorough investigation of a topic related to this subject. An honors contract may incorporate research, a paper, or project and includes individual meetings with a faculty mentor. Student must be currently enrolled in the regular section of the courses or have completed it the previous semester. Contact the Honors Program Office, COM 201, for more information.

**BIOL 134 Principles of Sustainability (3 Hours)**

Principles of Sustainability introduces students to the social, economic and environmental dimensions of sustainability and sustainable development. The course will critically examine the use of sustainable principles to guide decision making and problem solving in personal, campus, community and global contexts. Students will engage in a variety of individual, group, campus and community activities and collaborate with campus and community offices and agencies in order to identify, assess and address local sustainability needs. Students will be required to present their projects at a public sustainability forum. 3 hrs. lecture/wk.

**BIOL 135 Principles of Cell and Molecular Biology (4 Hours) nbsp;**

This is an integrated lecture and laboratory course for biology majors and students planning to take additional courses in biology. Subjects covered include basic biochemistry, cell structure and function, cellular metabolism, Mendelian and molecular genetics, natural selection and evolution, cell physiology, and development of plants and animals from the single-celled stage to the embryonic stage. 3 hrs. lecture, 2 hrs. lab/wk.

**BIOL 135H HON: Principles of Cell and Molecular Biology\* (1 Hour)**

**Prerequisites:** Honors department approval.

One-credit hour honors contract is available to qualified students who have an interest in a more thorough investigation of a topic related to this subject. An honors contract may incorporate research, a paper, or project and includes individual meetings with a faculty mentor. Student must be currently enrolled in the regular section of the courses or have completed it the previous semester. Contact the Honors Program Office, COM 201, for more information.

**BIOL 140 Human Anatomy (4 Hours)**

Students will study gross and microscopic aspects of cells, tissues and organ systems of the human body. They will concentrate on a detailed analysis of the structure of each body system. Integrated lecture and lab, 6 hrs. integrated lecture/lab/wk.

**BIOL 140H HON: Human Anatomy\* (1 Hour)**

**Prerequisites:** Honors department approval.

One-credit hour honors contract is available to qualified students who have an interest in a more thorough investigation of a topic related to this subject. An honors contract may incorporate research, a paper, or project and includes individual meetings with a faculty mentor. Student must be currently enrolled in the regular section of the courses or have completed it the previous semester. Contact the Honors Program Office, COM 201, for more information.

**BIOL 144 Human Anatomy and Physiology\* (5 Hours) nbsp;**

**Prerequisites:** RDG 126 or College Reading Readiness.

This course provides basic knowledge on human structures and their function. Students will study the relationship of structures to function in the organ systems of the human body. Emphasis will be on the identification of the anatomical features and their functions. This course is integrated lecture and laboratory. 7 hrs. integrated lecture/lab/wk. The Open Anatomy Lab, 311 CLB, is available for students enrolled in Human Anatomy and Human Anatomy and Physiology classes at JCCC. Contact your professor, check the schedule outside of 311 CLB or call 913-469-8500, ext. 4124, for hours. A current student ID is required for using the Open Anatomy Lab.

**BIOL 144H HON: Human Anatomy and Physiology\* (1 Hour)**

**Prerequisites:** Honors department approval.

One-credit hour honors contract is available to qualified students who have an interest in a more thorough investigation of a topic related to this subject. An honors contract may incorporate research, a paper, or project and includes individual meetings with a faculty mentor. Student must be currently enrolled in the regular section of the courses or have completed it the previous semester. Contact the Honors Program Office, COM 201, for more information.

**BIOL 145 Human Anatomy and Physiology Dissection\* (1 Hour)**

**Prerequisites:** BIOL 144 and department approval.

Students will dissect the cat and study the relationship of structures to function in the organ systems of the cat. In this laboratory course, they will also dissect the cow kidney, heart, brain and eye. Students will compare and contrast these structures and functions with the organ systems of the human body. 2 hrs. lab/wk. Students enrolling in BIOL 145 should have completed BIOL 140 or BIOL 144 and have the approval of the assistant dean.

**BIOL 150 Biology of Organisms\* (5 Hours)**

**Prerequisites:** BIOL 135 or department approval.

This is a survey of the five kingdoms of life. Monera, fungi, protista, plant and animal kingdoms will be presented, with emphasis on life cycles, anatomy, physiology and ecology of the major groups. 7 hrs. integrated lecture/lab/wk.

**BIOL 155 Bioethics\* (3 Hours)**

**Prerequisites:** BIOL 121 or high school biology with department approval.

This course introduces students to the scientific, ethical and legal issues relevant to the discipline of biology and those raised by the rapid development of new biological technologies. Students will examine the major theories of ethics, including deontology, utilitarianism, and select others. Topics include: beginning of life issues such as contraception, abortion, and nontraditional methods of human reproduction; end of life issues such as advance healthcare directives and physician-assisted suicide; and other issues such as experimentation on human and animal subjects and human environmental impacts. 3 hrs. lecture/wk. BIOL 155 and PHIL 155 are the same courses; only enroll in one.

**BIOL 205 General Genetics\* (4 Hours)**

**Prerequisites:** BIOL 135 with a grade of "C" or higher or the equivalent introductory college-level course with a grade of "C" or higher.

This introductory course emphasizes human heredity using concepts from classical and modern genetics. Themes of advancing technologies and bioethical issues are interwoven in the basic background fabric of the course. 3 hrs. lecture, 3 hrs. lab/wk.

**BIOL 214 Introduction to Teaching Math and Science I\* (1 Hour)**

**Prerequisites:** MATH 171 with a grade of "C" or higher or appropriate score on the math placement test or department approval.

This course allows math and science students to explore and develop an appreciation for teaching as a career. To support their learning, students will be introduced to the theory and practice that is necessary to design and deliver quality instruction. They will plan and implement lessons of an inquiry-based curriculum in an elementary classroom during the semester. MATH 214, ASTR 214, BIOL 214, CHEM 214, GEOS 214, PHYS 214 and PSCI 214 are the same course; enroll in only one. 1.25 hrs. lecture/wk.

**BIOL 215 Introduction to Teaching Math and Science II\* (1 Hour)**

**Prerequisites:** ASTR 214 or BIOL 214 or CHEM 214 or GEOS 214 or MATH 214 or PHYS 214 or PSCI 214 with a grade of "C" or higher.

Students learn about the middle school environment and work on math and science inquiry-based lesson analysis, design and assessment. Student partners will plan and teach three inquiry-based lessons in a middle school. The course emphasizes writing 5E lesson plans with a focus on the importance of using appropriate questioning and assessment strategies throughout the lesson, as well as how to analyze and modify a lesson based on personal reflections and observer feedback. By the completion of the course, students should be able to reflect on their personal suitability/interest in teaching secondary math or science, and develop a feasible pathway to a career in teaching. MATH 215, ASTR 215, BIOL 215, CHEM 215, GEOS 215, PHYS 215 and PSCI 215 are the same course; enroll in only one. 1.25 hrs. lecture/wk.

**BIOL 225 Human Physiology\* (4 Hours)**

**Prerequisites:** BIOL 140 or BIOL 144.

**Prerequisites or corequisites:** CHEM 122 or (CHEM 124 and CHEM 125).

This is an introduction to the dynamic functions of the human organism from the chemical and molecular mechanisms that sustain cellular processes through the control systems responsible for homeostasis and the influence of these systems on the cellular function of organ and systems operation. Laboratory investigation using selected biochemical and physiological preparations allows correlation of theory with experimental observations. 6 hrs. integrated lecture/lab/wk.

**BIOL 225H HON: Human Physiology\* (1 Hour)**

**Prerequisites:** Honors department approval.

One-credit hour honors contract is available to qualified students who have an interest in a more thorough investigation of a topic related to this subject. An honors contract may incorporate research, a paper, or project and includes individual meetings with a faculty mentor. Student must be currently enrolled in the regular section of the courses or have completed it the previous semester. Contact the Honors Program Office, COM 201, for more information.

**BIOL 227 Human Pathophysiology\* (4 Hours)**

**Prerequisites:** BIOL 144 or BIOL 225.

This introduction to the physiology of disease covers common disorders of the body from the cellular to the systemic level. Topics include causes, symptoms, diagnostic tests and treatments of disease. 4 hrs. lecture/wk.

**BIOL 227H HON: Human Pathophysiology\* (1 Hour)****Prerequisites:** Honors department approval.

One-credit hour honors contract is available to qualified students who have an interest in a more thorough investigation of a topic related to this subject. An honors contract may incorporate research, a paper, or project and includes individual meetings with a faculty mentor. Student must be currently enrolled in the regular section of the courses or have completed it the previous semester. Contact the Honors Program Office, COM 201, for more information.

**BIOL 230 Microbiology\* (3 Hours)****Prerequisites:** CHEM 122 or CHEM 124 and CHEM 125 or one year of high school chemistry.

This is a general introductory course in microbiology. It provides a background in many areas of microbiology with an emphasis on medical aspects. The structure, physiology, antimicrobial agents, immunology and host-parasite relationship of microorganisms will be studied, with an emphasis on bacteria. 3 hrs./wk.

**BIOL 230H HON: Microbiology\* (1 Hour)****Prerequisites:** Honors department approval.

One-credit hour honors contract is available to qualified students who have an interest in a more thorough investigation of a topic related to this subject. An honors contract may incorporate research, a paper, or project and includes individual meetings with a faculty mentor. Student must be currently enrolled in the regular section of the courses or have completed it the previous semester. Contact the Honors Program Office, COM 201, for more information.

**BIOL 231 Microbiology Lab\* (2 Hours)****Prerequisites:** BIOL 231 students must be currently enrolled in BIOL 230 or have successfully completed BIOL 230 within the last three years.

Students will learn aseptic techniques and apply them in the isolation of pure cultures of bacteria. Students will also perform various staining techniques and chemical tests to identify these bacteria. The response of bacteria to changes in environmental conditions will also be examined. Various life stages of medically important parasites will also be observed. 4 hrs. lab/wk.

**BIOL 235 General Nutrition\* (3 Hours) nbsp;****Prerequisites:** [CHEM 122 or (CHEM 124 and CHEM 125)] AND [BIOL 144 or (BIOL 140.**Prerequisites or corequisites:** BIOL 225)].

This introductory course provides a basic knowledge of human nutrition. Students will learn the sources and functions of the various nutrients. They will also explore the interaction of diet, disease prevention and treatment. Through the use of a computerized nutrition program, students will analyze their diets for nutritional deficiencies and excesses. 3 hrs. lecture/wk.

**BIOL 235H HON: General Nutrition\* (1 Hour)****Prerequisites:** Honors department approval.

One-credit hour honors contract is available to qualified students who have an interest in a more thorough investigation of a topic related to this subject. An honors contract may incorporate research, a paper, or project and includes individual meetings with a faculty mentor. Student must be currently enrolled in the regular section of the courses or have completed it the previous semester. Contact the Honors Program Office, COM 201, for more information.

**BIOL 240 General Pharmacology\* (3 Hours)****Prerequisites:** BIOL 225.

This course provides a basic understanding of the science of drugs-how they work and what they do. Students will study various drug concepts including mechanism of action, pharmacologic class, pharmaco-kinetics, pharmacodynamics and clinical implications. 3 hrs. lecture/wk. Spring.

**BIOL 291 Independent Study\* (1-7 Hour)****Prerequisites:** 2.0 GPA minimum and department approval.

Independent study is a directed, structured learning experience offered as an extension of the regular curriculum. It is intended to allow individual students to broaden their comprehension of the principles of and competencies associated with the discipline or program. Its purpose is to supplement existing courses with individualized, in-depth learning experiences. Such learning experiences may be undertaken independent of the traditional classroom setting, but will be appropriately directed and supervised by regular instructional staff. Total contact hours vary based on the learning experience.