



BIOL 1050

Division: Natural Science and Mathematics

Department: Biology

Course: BIOL 1050

Title: Human Biology

Catalog Description:

Human Biology is the study of the human species at several levels of organization with emphasis of the major organ systems and consideration of health issues, genetics, evolution, and man's interaction with the environment as related to the biology of humans and the quality of life. This course is for students whose major course of study is not in the sciences. This course will partially satisfy the Natural Science GE requirement (LS).

General Education Requirements: Life Science

Semesters Offered: Fall, Spring

Credit/Time Requirement: Credit: 3; Lecture: 3; Lab: 0

Clock/Hour Requirements: 0

Offered for Non-Credit: No

Corequisites: None

Justification:

A basic knowledge and understanding of human anatomy, physiology and health may have a major effect on the quality of life of those possessing it and on their dealings with related issues such as diet, air quality, and drugs, as well as their political activity on such issues. A course in human biology gives the student a look at biology from the human perspective, that is, how biology is directly related to everyday life. Other colleges and universities in Utah offering comparable courses are: BYU, PDBio 205; Dixie State College, BIOL 1200; WSU ZOO 1020.

Student Learning Outcomes:

Upon successful completion of this course, students will

- have a basic foundation in human anatomy and physiology at the molecular, cellular, systemic, and organism levels
- be able to relate this knowledge to human evolution, human ecology, as well as current and common personal and social issues such as to substance abuse, eating disorders, physical fitness, air quality, etc.
- Specific objectives are made available to students with the expectation that these objectives will prepare students for effective application in their daily lives.

Content:

BIOL 1050

This course will include:

- Introduction to science, and the Scientific Method as a way of learning
- Introduction to biology, anatomy, and physiology
- Chemistry
 - basic chemistry
 - atoms, molecules, ions
 - covalent, ionic, and hydrogen bonding
 - solutions, mixtures
 - pH and buffers
 - biological chemistry
 - carbon chains and rings
 - functional groups
 - polymers
 - lipids
 - carbohydrates
 - amino acids and proteins
 - nucleic acids
- Cells
 - cell structure and function
 - cell theory
 - cell structures in eukaryotes
 - functions of eukaryote cell structures
 - membrane components
 - diffusion, osmosis, facilitated diffusion, active transport, chemiosmotic theory
 - cytoplasmic organelles
 - cytoskeleton and related structures
- Metabolism
 - energy transformation; endothermic and exothermic chemical reactions; enzymes
 - cellular respiration and fermentation--glycolysis, Krebs Cycle and oxidative phosphorylation in mitochondrion matrix and cristae, lactic acid and alcoholic fermentation
- Homeostasis
- Tissues
 - epithelial tissue, characteristics, classification, functions and locations
 - connective tissues, characteristics, general and specialized connective tissues
 - muscle tissue, types, locations and functions
 - nervous tissue, characteristics, cell types in nervous tissue
 - tissue organization into systems with the integumentary system as example
- Digestive System
 - digestive system structures
 - the process of digestion
 - enzymes of digestion
 - accessory organs of digestion
 - nutrition
- Circulatory System
 - composition of blood
 - function of blood

- blood clotting
- capillary exchange
- blood typing
- blood vessels structure and function
- the heart structure, function and control
- principles of blood flow
- blood circulation pathways
- cardiovascular disorders
- the lymphatic system
- Respiratory System
 - respiratory system structures
 - respiratory system functions
 - levels of respiration
 - mechanisms of breathing
 - gas exchange in the body
 - diseases and disorders of the respiratory system
- Urinary System
 - urinary system structure and function
 - urine formation
 - water-salt balance
 - diseases and disorders of the urinary system
- Skeletal System
 - tissue structure of the skeletal system
 - bone growth and repair
 - bones of the skeleton
 - articulations
- Muscle
 - structure and function of skeletal muscle
 - structure and function of the muscle fiber
 - principles of contraction
 - types of muscle tissue
 - diseases and disorders of muscle
- Nervous system
 - nervous tissue, classes of neurons
 - neuroglia
 - nerve impulse
 - neuron communication
 - divisions of the central nervous system and their major functions
 - the peripheral nervous system, cranial nerves, spinal nerves and the autonomic nervous system
 - drug abuse
- The Senses
 - general sensory receptors and sensation
 - gustatory and olfaction
 - sense of vision with structures and function
 - vestibular and cochlear structures and functions

- Endocrine System
 - hormones, classification and mechanism of action
 - endocrine glands, associated hormones, actions, and control
 - disorders of the endocrine system
- Reproductive System
 - male reproductive system structures and functions
 - hormones of the male reproductive system and control
 - spermatogenesis
 - female reproductive system structures and functions
 - hormones of the female reproductive system, ovarian cycle, uterine cycle
 - oogenesis
 - control of reproduction
- Development
 - fertilization
 - gastrulation
 - embryonic development
 - fetal development
 - birth
 - development after birth
 - human life cycle
- The Cell Cycle
 - mitosis in detail
 - cytokinesis
 - meiosis in detail and gamete production
 - chromosomal inheritance
 - contrast mitosis with meiosis
- Inheritance
 - nondisjunction of chromosomes
 - common human syndromes caused by chromosomal
 - simple genetics
 - dominant/recessive traits
 - sex-linked traits
 - pedigrees for human genetic diseases
- DNA and Protein Production
 - DNA replication, mutations and repair
 - transcription and RNA processing
 - translation or protein synthesis
 - genetic code, mRNA, tRNA, rRNA, ribosomes
 - gene expression
 - some ramifications of genetic engineering
- Defense Against Disease
 - organs, tissues, and cells of the immune system
 - non-specific defenses
 - specific defense and immunity
 - disorders of the immune system
- Parasites and Pathogens

- symbiosis and pathogenesis
- viruses, a non-living pathogen
- bacteria as infectious agents
- other pathogens, including fungi and protozoa
- Sexually Transmitted Diseases
 - bacterial STD's
 - viral STD's
 - HIV and AIDS
 - other STD's
- Cancer
 - normal cell characteristics vs. cancer cell characteristics
 - causes of cancer
 - cancer: diagnosis and treatment
 - warning signs of cancer
- Human Evolution
 - taxonomy of homo sapiens
- Ecology
 - habitat, ecosystem, energy flow and nutrient recycling
 - trophic levels and food webs
 - global communities
- Population Effects
 - factors influencing population dynamics, niche, community, resources and pollution
- Biodiversity
 - causes of extinction
 - conservation techniques

General Education Outcomes:

1) Read effectively, constructively, and critically.

Students read the text throughout the course. Throughout the semester, students will complete homework assignments or study guide with multiple types of questions, including true/false, multiple choice, fill-in-the-blank/short answer, and essay questions. Effectively completing the homework or study guide will require reading effectively, constructively, and critically. The homework, study guide, test questions, discussions, etc. are evaluated on synthesis and critical thinking processes.

2) Write clearly, informatively, and persuasively.

Students will complete the homework or study guide, including several short answer and essay questions, over the course of the semester that will be evaluated for skills in writing as well as in the areas of synthesis and critical thinking. The essay questions will be evaluated for clarity, information content, and persuasive presentation of content.

7) Apply scientific reasoning to a variety of contexts.

Students will demonstrate scientific reasoning throughout the various topics considered in course content in their responses to tests, quizzes, discussions, etc. In homework, quizzes and tests some questions will contain information that will require the student, through scientific reasoning, to use that information to arrive at an answer to that question.

Key Performance Indicators:

Since different faculty and adjunct faculty teach the lecture course, teaching styles will vary, as will evaluation methods. The evaluation methods used will include

- tests and quizzes (70-90%)
- final exam (10-20%)
- homework, study guide, special projects, and/or reports (0-10%).
- The final examination will be comprehensive with questions on topics from each chapter comprising about 3-5% of the total number of questions.

Representative Text and/or Supplies:

- Sylvia S. Mader, *Human Biology*, current edition, McGraw Hill, New York, NY.
- Sylvia S. Mader, *Study Guide for use with Human Biology*, McGraw Hill, New York, NY.

Optimum Class Size: 24

Maximum Class Size: 48

Signatures:

I hereby submit this course syllabus:

Allan Stevens, , Professor

I hereby find this course consistent with the goals and resources of the Biology Department:

Allan Stevens, , Professor, Chair

I hereby find this course consistent with the goals and resources of the Natural Science and Mathematics Division:

Dan Black, EdD, Associate Professor, Dean

I have discussed the need for library resources related to this class with the person submitting the syllabus:

Lynn Anderson, MLIS, Technical Services Librarian (Main Campus)

Michelle Olsen, MLS, Campus Librarian (Richfield Campus)