BIOL A225: HUMAN PHYSIOLOGY

Item	Value
Curriculum Committee Approval Date	12/02/2020
Top Code	041000 - Anatomy and Physiology
Units	5 Total Units
Hours	162 Total Hours (Lecture Hours 54; Lab Hours 108)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	Yes
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S)
Associate Arts Local General Education (GE)	• OC Physical/Biological Sci - AA (OB)
Associate Science Local General Education (GE)	• OCC Physical/Biological Sci-AS (OSB)
California General Education Transfer Curriculum (Cal-GETC)	• Cal-GETC 5B Biological Sciences (5B) • Cal-GETC 5C Laboratory Activity (5C)
Intersegmental General Education Transfer Curriculum (IGETC)	• IGETC 5B Biological Sciences (5B) • IGETC 5C Laboratory Activity (5C)
California State University General Education Breadth (CSU GE-Breadth)	• CSU B2 Life Science (B2) • CSU B3 Laboratory Activity (B3)

Course Description

This course studies the physiological principles, function, integration and homeostasis of the human body at all levels of biological organization with an emphasis on the relationship of structure (Anatomy) and function (Physiology). Basic concepts and practical applications are stressed. Laboratory participation is required. This course meets requirements for pre-nursing, physical therapy and physical education majors. ADVISORY: BIOL A220 or BIOL A221; and CHEM A110, CHEM A130, or CHEM A180. Transfer Credit: CSU; UC: Credit Limitation: Credit for either BIOL A221 or BIOL A220 and BIOL A225. C-ID: BIOL 120B.**C-ID:** BIOL 120B.

Course Level Student Learning Outcome(s)

1. Recognize the contribution of each organ system to the maintenance of physiological homeostasis.
2. Demonstrate knowledge of the scientific method by designing and executing laboratory experiments, analyzing data, composing laboratory reports and defending original work in a presentation created by student teams.
3. Recognize and describe how interactions between organ systems affect the function of the whole organism.

Course Objectives

- 1. Describe and distinguish various roles of major classes of biomolecules in living cells.
- 2. Describe key functional features of different types of human cells and how they communicate.
- 3. Demonstrate an understanding of how organ systems of the body are integrated and regulated.
- 4. Identify key functions of major organ systems and the physiological mechanisms underlying their operation.
- 5. Demonstrate an understanding of how homeostasis is maintained in the body.
- 6. Demonstrate knowledge of metabolic and physiological disorders of the major organ systems.
- 7. Analyze experimental data to demonstrate physiological principles.
- 8. Demonstrate an understanding of the scientific method, experimental design, and the philosophy of science. Apply the scientific method and philosophy of science by designing components of and carrying out physiological experiments.
- 9. Interpret physiological literature to generate a research paper with an appropriate literature cited page.
- 10. Operate basic physiological laboratory equipment.

Lecture Content

The Chemistry of Life Chemical Composition Organic Molecules Cell Structure and Function Cell Membrane Membrane Transport Enzymes Genetic Control Protein Synthesis Evolution and Genetic Change Over Time Metabolism Anaerobic Aerobic Respiration Cell-Cell communication Nervous System Membrane Potential Action Potentials Neuronal Functioning Sense Organ Function Endocrine System Major Body Feedback Mechanisms Hormonal Function Contribution of the Skeletal System to Homeostasis Role of Bone Tissue in Homeostasis Muscle Physiology Skeletal Muscle Structure and Function Heart Cardiac Cycle Cardiovascular System Function and Regulation Lymphatic System and Immunity Respiratory system Function and Regulation Lung Ventilation Gas Exchange Gas Transport Urinary System Function and Regulation Water, Electrolyte, and Acid-Base Balance Digestion and Nutrition Metabolism Thermoregulation Reproductive Functions and Regulation Clinical applications will be stressed throughout.

Lab Content

1. Introduction to empirical science a. Good science vs. bad science b. Scientific literature searches or-latin; mso-bidi-font-family: Cambria; mso-bidi-theme-font: minor-latin;">c. Experimental design For each of the following topics, students will be conducting self-designed experiments, performing a critical evaluation of their results, and writing a lab report on that topic. 2. Enzyme kinetics 3. Biofeedback 4. Electromyography (EMG)

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- Lab (04)
- DE Live Online Lab (04S)

Instructional Techniques

1. Presentation software based lectures to illustrate concepts 2. Demonstration of laboratory methodologies. 3. Small group discussions

in the laboratory 4. Web-based accessibility of all course materials, including PowerPoint lectures. 5. Small group activities in the laboratory. 6. Peer feedback on laboratory PowerPoint presentation. 7. Interactive computer software available for self-paced learning. 8. Use of data acquiring and data analysis software with graphing capabilities.

Reading Assignments

Reading assignments are given from the text, and appropriate, relevant primary research articles are also assigned to emphasize and expand upon lecture-related material. (3 hours/week)

Writing Assignments

Term paper (1.75 hours/week) Laboratory Reports

Out-of-class Assignments

Out of class assignments include a term paper on the physiological material of the students choice, journal article reviews, and laboratory reports based on experiments conducted in lab. (2 hours/week)

Demonstration of Critical Thinking

In the lecture component of the class: Exams with objective questions and subjective essay questions. In the laboratory component of the class: Laboratory reports, one research paper, one PowerPoint presentation of unique work, and one comprehensive written laboratory final.

Required Writing, Problem Solving, Skills Demonstration

In the lecture component of the class: Exams with objective questions and essay questions. In the laboratory component of the class: Laboratory reports, one research paper, one PowerPoint presentation of unique work, and one comprehensive written laboratory final.

Eligible Disciplines

Biological sciences: Masters degree in any biological science OR bachelors degree in any biological science AND masters degree in biochemistry, biophysics, or marine science OR the equivalent. Masters degree required.

Textbooks Resources

1. Required Silverthorn, D.U.. Human Physiology: An Integrative Approach, 8 ed. Pearson, 2019

Manuals Resources

1. Russell, G.A.. Supplemental Material Lab Manual, Self-published , 08-28-2018 2. Biopac. Biopac Lab Manual, Biopac Systems , 01-01-2015