BIOL C225: HUMAN PHYSIOLOGY

Item	Value
Top Code	041000 - Anatomy and Physiology
Units	4 Total Units
Hours	108 Total Hours (Lecture Hours 54; Lab Hours 54)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Open Entry/Open Exit	No
Grading Policy	Standard Letter (S), • Pass/No Pass (B)
Local General Education (GE)	• Area 5B Life Sciences (CB2)
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

Formerly: BIOL C175. Emphasis is on integration of body systems and the interrelationships for maintaining body homeostasis. This course is designed for pre-medical health field majors including the pre-nursing, pre-physical therapy, pre-occupational therapy, pre-pharmacy, pre-physician assistant, pre-dental, and pre-medical student. PREREQUISITE: BIOL C220 and CHEM C110 or CHEM C130 or CHEM C180; or may be taken concurrently. ADVISORY: A course taught at the level of Preparation for College Composition or appropriate English placement and a course taught at the level of intermediate algebra or appropriate math placement. Transfer Credit: CSU; UC: Credit Limitation: Credit may be granted for either BIOL C102 or BIOL C221 or BIOL C220, BIOL C225. C-ID: BIOL 120 B.**C-ID:** BIOL 120 B.

Course Level Student Learning Outcome(s)

1. Given a specific body organ, correlate the structure of this organ to its function and outline the role of this specific organ in maintaining homeostasis.
2. Given a series of scenarios, compare and contrast normal physiological processes and abnormal pathological conditions.
3. Define the basic concepts of human physiology.

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. Identify key functions of major organ systems and the physiological mechanisms underlying their operation.
- 4. Demonstrate an understanding of how organ systems of the body are integrated and regulated.
- 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.

Lecture Content

Introduction to Human Physiology Organization of the Human body Mechanisms of Homeostasis The Structure and Function of the Cell Bio Molecules The Plasma Membrane The Nucleus Cell Organelles Cell Division Cell Metabolism The Endocrine System and Chemical Messengers Intercellular Communications Chemical messengers The Endocrine Glands The Nervous System and the Sensory Organs Cells of the Nervous System Electric Signals in the Neurons Synaptic Transmission The Central nervous System The Sensory System The Autonomic and Motor Systems The Sensory Organs The Muscular System Structure of Skeletal muscles Mechanism of Skeletal Muscles contraction Other types of muscles (smooth and Cardiac) The Cardiovascular System Major components of the Cardiovascular System Blood flow through the systemic and Pulmonary circulations The Electric activity of the Heart The Cardiac Cycle The Cardiac output and its control Blood Pressure and its regulation Blood and Lymph The Blood Cells and their functions The Mechanism of Blood Coagulation Lymph and its circulation in the body The Respiratory system Pulmonary Ventilation and its regulation Pulmonary circulation and Exchange of gases Role of the Respiration in maintaining the Acid Base balance The Urinary System Formation of Urine Excretion of Urine and Micturition Water and Electrolytes balance Acid Base balance The Digestive System Organs of the digestive Sy stem and their functions Digestion, Absorption of Nutrients and Elimination of waste. Regulation of Gastrointestinal secretions and motility. The Reproductive System and Genetics Meiosis and Gene sorting The Physiology of the Male Reproductive System The Physiology of the Female Reproductive System Fertilization and Pregnancy Parturition and Lactation Metabolism and Growth Growth hormone and its effects General Overview of Metabolism Energy intake, Utilization and Storage Energy balance The Immune System Organs of the Immune System Organization of Body Defenses The Immune Responses in Health and Disease

Lab Content

The physiology laboratory classes are designed to complement the course lectures. Laboratories are designed to enhance the student s knowledge of the human body. Experiments may utilize students actual bodies or simulations including virtual, online or through the BIOPAC computer system. Lab topics may include, but are not limited to the

following: Homeostasis-both experimental utilizing equipment (such as the water bath/thermostat) and experimental utilizing their own body (such as pulse change with running in place) to emphasize the understanding of set point; receptor; integrating center; and effector. Understanding osmosis-experiments to show this concept Microscopic examination and understanding of tissues BIOPAC simulation of EEG, EMG, respiration, and EKG or similar Experimental studies of the reflex arch, spinal pathways and cerebral and cerebellar testing Experimental studies of the function of sensation (touch, vibration, proprioception), visual and auditory systems Histology and understanding of the endocrine system Simulation of blood group testing; heart sound and blood pressure Renal physiology and the examination of urine Digestive system physiology; examination of tissues; basic nutrition Reproductive tissue and function Demonstrate understanding of basic CPR, Heimlich maneuver, and AED use.

Method(s) of Instruction

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

Instructional Techniques

Lecture, PowerPoint, videos, laboratory experiments, essays, discussions.

Writing Assignments

Essays

Out-of-class Assignments

Reading assignments, essays, lab exercises.

Demonstration of Critical Thinking

Any combination of exams, quizzes, projects, essays, written assignments, practicals.

Required Writing, Problem Solving, Skills Demonstration

Any combination of exams, quizzes, projects, essays, written assignments, lab assignments.

Eligible Disciplines

Biological sciences: Master's degree in any biological science OR bachelor's degree in any biological science AND master's degree in biochemistry, biophysics, or marine science OR the equivalent. Master's degree required. Kinesiology: Master's degree in kinesiology, physical education, exercise science, education with an emphasis in physical education, kinesiology, physiology of exercise, or adaptive physical education OR Bachelor's degree in any of the above AND Master's degree in any life science, dance physiology, health education, recreation administration or physical therapy OR the equivalent.

Textbooks Resources

1. Required Fox, Stuart Ira. Human Physiology, 15 th ed. McGraw Hill, 2019

Manuals Resources

1. Deborah Henry. Laboratory Exercises in Human Physiology, Morton Publishing ISBN 9781617317944 , 01-01-2016

Other Resources

1. Coastline Library 2. Handouts 3. Labster online or equivalent 4. OERhttps://open.oregonstate.education/aandp/ (Anatomy Physiology by Lindsay M. Biga, Sierra Dawson, Amy Harwell, Robin Hopkins, Joel Kaufmann, Mike LeMaster, Philip Matern, Katie Morrison-Graham, Devon Quick Jon Runyon)