

PHYSIO 1 Course Outline as of Fall 1997**CATALOG INFORMATION**

Dept and Nbr: PHYSIO 1 Title: HUMAN PHYSIO

Full Title: Human Physiology

Last Reviewed: 5/8/2023

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	5.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	5.00	Lab Scheduled	6.00	6	Lab Scheduled	105.00
		Contact DHR	0		Contact DHR	0
		Contact Total	9.00		Contact Total	157.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00

Total Student Learning Hours: 262.50

Title 5 Category: AA Degree Applicable

Grading: Grade or P/NP

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

Catalog Description:

Mechanisms underlying normal body functions from cells to systems such as neuromuscular, cardiovascular, digestive, renal, respiratory and reproductive. Selected examples of disturbances to the normal functioning of these systems will be considered and related to homeostatic mechanisms. Laboratory projects are conducted and designed to illustrate major principles of the aforementioned systems.

Prerequisites/Corequisites:

Completion of CHEM 60 or higher (V6) and Completion of BIO 10 or higher (V7)

Recommended Preparation:**Limits on Enrollment:****Schedule of Classes Information:**

Description: Processes and mechanisms underlying the normal body functioning from cells to systems such as neuromuscular, cardiovascular, immune, renal, respiratory and reproductive.
(Grade or P/NP)

Prerequisites/Corequisites: Completion of CHEM 60 or higher (V6) and Completion of BIO 10

or higher (V7)

Recommended:

Limits on Enrollment:

Transfer Credit: CSU;UC. (CAN BIOL12)(PHYSIO 1+ANAT 1=BIOL SEQ B)

Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	Area		Effective:	Inactive:
	C	Natural Sciences	Fall 1981	
CSU GE:	Transfer Area		Effective:	Inactive:
	B2	Life Science	Fall 1981	
	B3	Laboratory Activity		
IGETC:	Transfer Area		Effective:	Inactive:
	5B	Biological Sciences	Fall 1981	
	5C	Fulfills Lab Requirement		
CSU Transfer:	Transferable	Effective:	Fall 1981	Inactive:
UC Transfer:	Transferable	Effective:	Fall 1981	Inactive:

CID:

CID Descriptor:BIOL 120B Human Physiology with Lab
SRJC Equivalent Course(s): PHYZ1

Certificate/Major Applicable:

Not Certificate/Major Applicable

COURSE CONTENT

Outcomes and Objectives:

The students will:

1. Describe the characteristics of the scientific method and how it forms the basis of all modern scientific research.
2. Define homeostatis and how positive and negative flashback mechanisms function.
3. Describe the structures and functions of water, carbohydrates, lipids, and proteins.
4. Explain how a cell's components are organized and capable of function necessary for its survival.
5. Demonstrate an understanding of the first and second laws of thermodynamics by applying these concepts when describing the production and significance of ATP.
6. Describe the biological pathways for extracting energy from carbohydrates, lipids and proteins and pathways for their synthesis.
7. Describe the plasma membrane, methods by which materials are exchanged across it and how a membrane potential is produced.
8. Explain how neurons are specialized for electrical and chemical signaling through modifications in their membrane potential and how neurons communicate with other cells.
9. Define and describe the central nervous system, it's major components,

and how it plays a central role in communication with the internal and external environment.

10. Distinguish the autonomic neurons from the central nervous system and define the role of the former through a knowledge of pharmacology.
11. Discuss the peripheral nervous system by comparing afferent and efferent pathways, describing the functions of receptors and target organs and explaining reflexes, paying special attention to skeletal muscle.
12. Define hormones, discuss their secretion and actions and the roles of second messengers.
13. Explain in detail the cardiac cycle and related mechanical and electrical events. Explain the basis for ischemia and common heart diseases and their treatment.
14. Describe the regulatory factors of cardiac output and explain the collaborative contribution of vascular resistance to homeostasis.
15. Describe how compliance, surface tension and intrapleural pressures have a role in ventilation. Describe chronic obstructive disease and how it can be diagnosed by spirometry. Explain how the oxyhemoglobin saturation curve is used to derive the unloading percentage of oxygen under varying blood acidities.
16. Explain how water and solutes are transported in various segments of the kidney nephron and describe the roles of antidiuretic hormone and aldosterone in renal function.
17. Describe the contributions of the kidneys and respiratory system to acid-base regulation and how this is diagnosed using blood gas analysis.
18. Describe the functions of the digestive system and list its regions and secretions.
19. Compare and contrast the male and female reproductive systems by describing the inheritance of chromosomes, the consequence on gonadal development and external genitalia, the roles and regulation of hormones and the timing of gametogenesis. Describe the cyclic changes in the endometrium before and after pregnancy.
20. Operate various types of electrical and mechanical equipment to perform experiments and to conduct common measurements in human physiology.
21. Effectively communicate verbally and through essays.
22. Conduct independent scientific research and prepare a research report.
23. Use library resources to write essays and research reports.

Topics and Scope:

Lecture Material

1. Scientific Method.
 - A. critical thinking as a tool in understanding concepts in human physiology.
2. Definition of Physiology.
 - A. homeostasis
3. Cell Structure and Function.
4. Transport Mechanisms.
 - A. diffusion and osmosis
5. Neurophysiology.

- A. neuron structure, membrane potentials, neurotransmitters and synaptic transmission
 - 6. Central Nervous System.
 - A. brain and spinal cord function
 - 7. Autonomic Nervous System.
 - A. pharmacology of drugs
 - 8. Sensory Physiology.
 - A. receptors, modalities and pathways
 - 9. Muscles.
 - A. microstructure and function, including reflexes
 - 10. Endocrinology.
 - 11. Cardiovascular Physiology.
 - A. blood and its functions
 - B. heart structure, cardiac cycle, electrophysiology and hemodynamics
 - 12. Immune System.
 - A. non-specific defenses
 - B. specific defenses
 - 13. Respiratory Physiology.
 - 14. Renal Physiology.
 - A. kidney structure, urine formation and pH balance
 - 15. Acid-Base Balance.
 - A. blood and gases
 - 16. Metabolism and Nutrition.
 - 17. Digestive System.
 - 18. Reproduction.
- Laboratory Material
- 1. Introduction, Microscopy
 - 2. Homeostasis and glucose
 - 3. Diffusion and Osmosis
 - 4. Electroencephalogram
 - 5. Reflex Arc and Computerized Reflex Physiology
 - 6. Sensory Physiology
 - 7. Muscle Physiology: Summation, Tetanus, and Fatigue; Computerized Muscle Physiology
 - 8. Electromyogram
 - 9. Electrocardiogram and Computerized Electrophysiology
 - 10. Mean electrical axis, heart sounds and blood pressure
 - 11. Pulmonary Function and Computerized Spirometry
 - 12. Renal regulation of fluid and electrolyte balance
 - 13. Hemoglobin, total blood and differential blood counts
 - 14. Artificial blood and blood typing

Assignment:

- 1. Laboratory exercises and reports.
- 2. Scientific paper prepared from classroom experiments.
- 3. Read textbook and laboratory manual.
- 4. Read and submit reports on current published literature in physiology.

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Reading reports, Essay exams, SCIENTIFIC PAPER

Writing
20 - 30%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Quizzes, Exams, LAB EXAMS

Problem solving
5 - 20%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Performance exams, TO CONDUCT PHYSIOLOGICAL MEASUREMENTS

Skill Demonstrations
15 - 25%

Exams: All forms of formal testing, other than skill performance exams.

Multiple choice, True/false, Matching items, Completion

Exams
20 - 30%

Other: Includes any assessment tools that do not logically fit into the above categories.

ATTENDANCE, PARTICIPATION, AND COOPERATION

Other Category
0 - 10%

Representative Textbooks and Materials:

HUMAN PHYSIOLOGY by Ira F. Stuart, W.C. Brown Publisher, 5th Edition, 1996

HUMAN PHYSIOLOGY FROM CELLS TO SYSTEMS, by Lauralee Sherwood, West Publishing Company, 2nd Edition, 1993