

Cañada College
Official Course Outline

1. **COURSE ID:** BIOL 260 **TITLE:** Human Physiology
Semester Units/Hours: 5.0 units; a minimum of 48.0 lecture hours/semester; a minimum of 96.0 lab hours/semester
Method of Grading: Letter Grade Only
Prerequisite: BIOL 250, and CHEM 192, CHEM 210 or CHEM 410 ; and completion of or eligibility for ENGL 100 and MATH 120.

2. **COURSE DESIGNATION:**
Degree Credit
Transfer credit: CSU; UC
AA/AS Degree Requirements:
 Cañada GE Area B: SCIENTIFIC INQUIRY AND QUANTITATIVE REASONING: B2: Life Science
 Cañada GE Area B: SCIENTIFIC INQUIRY AND QUANTITATIVE REASONING: B3: Lab
CSU GE:
 CSU GE Area B: SCIENTIFIC INQUIRY AND QUANTITATIVE REASONING: B2 - Life Science
 CSU GE Area B: SCIENTIFIC INQUIRY AND QUANTITATIVE REASONING: B3 - Laboratory Activity
IGETC:
 IGETC Area 5: PHYSICAL AND BIOLOGICAL SCIENCES: B: Biological Science
 IGETC Area 5: PHYSICAL AND BIOLOGICAL SCIENCES: C: Science Laboratory

3. **COURSE DESCRIPTIONS:**
Catalog Description:
 Students learn through lecture and laboratory experiences how human organ systems integrate functions to maintain homeostasis and to regulate change and growth processes in humans. This course is intended for students in kinesiology, nursing, radiologic technology, respiratory therapy, and for those in related fields such as psychology. This course is an elective for pre-dental and pre-medical students.
Schedule of Classes Description
 Study of the physiologic function and integration of the organ systems of the human body. For students in allied health and other related fields.

4. **STUDENT LEARNING OUTCOME(S) (SLO'S):**
 Upon successful completion of this course, a student will meet the following outcomes:
 - A. Explain the basis of membrane potentials and their significance to physiologic control systems.
 - B. Describe the coordinated responses of physiologic systems to maintain homeostasis and to regulate change and growth.
 - C. Propose and/or execute laboratory experiments in physiology. Analyze, interpret and effectively communicate results from these experiments.
 - D. Research, summarize and cite articles from peer-reviewed scientific literature.

5. **SPECIFIC INSTRUCTIONAL OBJECTIVES:**
 Upon successful completion of this course, a student will be able to:
 - A. Describe and distinguish various roles of major classes of biomolecules in living cells.
 - B. Distinguish the molecular processes of membrane transport and explain their importance to the function of physiologic systems.
 - C. Describe the role of electrical, chemical, electrochemical, and pressure gradients in driving physiological processes.
 - D. Compare the structure, function, forms of cell-cell communication, and effects of neural and endocrine control systems and illustrate their role in maintaining homeostasis and regulating change and growth.
 - E. Describe how multiple physiologic systems integrate their responses to maintain homeostasis, compensate for internal and external changes, and control metabolism.
 - F. Describe how failures of the major organ systems to maintain homeostasis leads to disease.
 - G. Propose and/or execute laboratory experiments in physiology. Analyze, interpret and effectively communicate results from these experiments.

6. **COURSE CONTENT:**

Lecture Content:

1. Chemistry of cell membranes, water, electrolytes, acid-base, enzymes
2. Homeostasis and feedback control systems
3. Thermoregulation
4. The cellular functions of membrane transport and ion channels
5. Cell-cell communication
6. Membrane potential, graded and action potentials, synapses and pharmacology
7. Sensory and neural control systems
8. Muscle physiology and integrative neuromuscular control of movement
9. Nutrition, digestion, assimilation and metabolism
10. Endocrine control systems
11. Reproductive function and regulation
12. Role of bony tissue in calcium homeostasis
13. Urinary regulation of fluid, electrolyte and acid-base balance
14. Lymphatic system and immunity
15. Cardiovascular function and regulation of blood pressure
16. Respiratory function, regulation of ventilation and gas exchange
17. The integrated functioning of major organ systems to maintain homeostasis during exercise
18. Disease as a result of a failure of homeostasis
19. Clinical applications

Lab Content:

In the laboratory students investigate physiologic processes through wet-lab (human subject) and computer simulations (animal subjects). Activities range from guided to full open inquiry labs. Students use the scientific method to investigate:

1. Homeostatic control and set points
2. Sensory and neural reflexes
3. Neurophysiology
4. Muscle physiology and electromyography
5. Glucose regulation
6. Endocrinology
7. Cardiac function, electrocardiology, and blood pressure
8. Pulmonary function and ventilation
9. Urine formation and regulation of fluid and electrolyte balance
10. Physiologic responses to aerobic exercise

7. REPRESENTATIVE METHODS OF INSTRUCTION:

Typical methods of instruction may include:

- A. Lecture
- B. Lab
- C. Activity
- D. Critique
- E. Discussion
- F. Experiments
- G. Guest Speakers
- H. Individualized Instruction
- I. Observation and Demonstration
- J. Other (Specify): Online simulations of laboratory experiments Online tutorials and other activities

8. REPRESENTATIVE ASSIGNMENTS

Representative assignments in this course may include, but are not limited to the following:

Writing Assignments:

- A. Students are required to complete several comprehensive lab reports over the course of the semester. These reports may be written individually or by small teams of students. The reports contain multi-part questions and require quantitative and qualitative analysis in addition to graph construction and interpretation.
- B. A portion of exams may require short written essay answers to questions.

Reading Assignments:

- A. Textbook: Students are expected to read approximately one chapter from the textbook each week (20-40 pp)
- B. Scientific Journals: Over the course of the semester, students are expected to read several journal articles from the primary scientific literature. A comprehensive understanding of the articles is not required but

students should be able to accurately identify the hypothesis and summarize the major findings.

- C. Laboratory: Students must read the background and instructions for each lab. Reading comprehension is assessed through short answers to questions in the lab report.

Other Outside Assignments:

- A. Students may be required to review sections of the online "Interactive Physiology" tutorial (Pearson Education Inc.) and to complete associated quizzes.
B. Students may be required to perform online laboratory simulations using the "PhysioEx" (Pearson Education Inc.) web-based program and answer associated quizzes and short essay answers.

To be Arranged Assignments (if applicable):

- Not applicable.

9. REPRESENTATIVE METHODS OF EVALUATION

Representative methods of evaluation may include:

- A. Class Work
B. Group Projects
C. Home Work
D. Lab Activities
E. Papers
F. Research Projects
G. Written examination
H. Quizzes and exams using one or more of the following formats: multiple choice, short answer, quantitative problem solving, essay. Written reports of laboratory activities. Reports may include tables, graphs, research and cited references from peer-reviewed scientific literature.

10. REPRESENTATIVE TEXT(S):

Possible textbooks include:

- A. Silverthorn, D.U. *Human Physiology: An Integrated Approach*, 6 ed. San Francisco, CA: Benjamin Cummings, 2013

Possible software includes:

- A. Interactive Physiology 10-system suite. Pearson, 10 ed.
B. PhysioEx. Pearson, 9.0 ed.

Origination Date: March 2013

Curriculum Committee Approval Date: March 2013

Effective Term: Fall 2013

Course Originator: Douglas Hirzel