



ANTELOPE VALLEY COLLEGE

Academic Affairs Office
Course Outline of Record

Update: 10/2006

COURSE SUBJECT & NUMBER: BIOL 202
COURSE NAME: General Human Physiology
COURSE UNITS: 4
COURSE HOURS: 6 (3 hours lecture, 3 hours lab)

COURSE REQUISITES: *(Follow format of similar courses found in the college catalog.)*

Prerequisite: Completion of BIOL 201 and CHEM 101.

ADVISORY: Eligibility for College Level Reading and ENGL 101, and Eligibility for Math 070.

COURSE DESCRIPTION: *(Write a short paragraph providing an overview of topics covered. Be sure to identify target audience--transfer, major, GE, degree/certificate, etc. If repeatable, state the number of times at end of description).*

An analysis of basic processes of the human body, emphasizing the coordinated physical and chemical mechanisms of cell biology, neuromuscular, cardiovascular, respiratory, digestive, immune, renal, endocrine and reproductive systems. Includes work with computerized instrumentation and living animals. Completion of this course requires full participation and use of all laboratory material. NOTE: This course is necessary for students entering many healthcare professions including the Associate Degree Nursing Program. It is also applicable for transfer students in the biological sciences. [CAN BIOL 12] (CSU,UC,AVC)

COURSE OBJECTIVES: *(Should be stated as performance-based, measurable expected student outcomes. Use Bloom's taxonomy to formulate clear and concise objectives. These objectives are common to all students; they must be clearly related to course content, assignments, and methods of evaluation.)*

Upon completion of course, the successful student will be able to:

1. Define, discuss, use and analyze concepts and principles relating to basic cellular and biochemical processes, including membrane transport, enzyme activity, energy transfer and metabolism, protein synthesis and the replication and expression of genetic information.
2. Discuss and apply basic mechanisms of membrane potentials and explain or differentiate the factors influencing the generation, propagation and synaptic transmission of nerve impulses and explain how sensory information is coded and processed by the brain.
3. Describe the physiology of motor activity by comparing and explaining the mechanisms of skeletal muscle excitability, contractility, metabolism and mechanics.
4. Discuss, integrate and assemble the concepts of heart and circulatory dynamics, blood reactions, immunological responses, respiratory mechanics, gas exchange and transport, digestion, absorption, gastrointestinal secretion and regulation of motility.
6. Explain and differentiate between renal and endocrine mechanisms that help maintain fluid, electrolyte and pH homeostasis in the body.
7. Describe the principles of hormonal control and discuss and analyze the involvement of the endocrine in metabolic regulation and reproductive physiology.
8. In the lab, students will demonstrate and test physiological concepts using computerized instrumentation, living animals, and their own bodies. They will analyze data, make computations, formulate conclusions and be able to compose laboratory reports in accordance with the scientific method.

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COURSE CONTENT: *(Enter course content in terms of specific topics or a specific body of knowledge that each instructor must cover. Put topics in outline form with major and minor headings. Title 5 requires that each instructor covers all material listed here.)*

I. Cell and Molecular Physiology

Atoms, molecular bonding, cell membranes and enzymes

Metabolic pathways

Protein synthesis, gene expression and mutation

Lab activities to include:

- Diffusion, osmosis and hemolysis
- Enzyme kinetics
- Cellular respiration
- DNA extraction

II. Neuromuscular Physiology

The neuron and action potentials

Receptors, spinal reflexes and processing of sensation

Muscle physiology and mechanics

Lab activities to include:

- Use of data recording devices
- Recording of nerve APs or EMGs
- Skeletal muscle mechanics

III. Cardiovascular, Respiratory, Digestive and Immune Physiology

Heart and peripheral circulation

Blood and blood reactions

Immunology

Respiratory physiology

Digestive physiology

Lab activities to include:

- Cardiac activity and ECG
- Blood cell parameters and typing
- Respiratory regulation

IV. Renal, Endocrine and Reproductive Physiology

Renal physiology

Endocrine and metabolic physiology

Reproductive physiology

Lab activities to include:

- Urinalysis
- Projects in Endocrinology

TYPICAL READING, WRITING, AND COMPUTATIONAL HOMEWORK ASSIGNMENTS

This material is necessary for all credit courses. Assignments should be clearly related to course objectives, content, and methods of evaluation. (See sample of a "Model Outline" in the AP&P Standards & Practices handbook.) Include a range of assignments (minimum of three) from which faculty may choose when designing their syllabus.

1. Describe nature and frequency of typical reading assignments if applicable; note if any are required:

Students will read a minimum of 50 pages weekly. Assignments will include applicable chapters in the textbook, weekly laboratory exercises in the lab manual and other handouts or study materials.

2. Describe nature and frequency of typical writing assignments if applicable; note if any are required:

Students will be required to write brief answers to questions in their laboratory manual or answer similar questions on weekly lab reports and/or quizzes.

In small groups, students will design and execute a two-week laboratory experiment in mammalian endocrinology. The data will be collected and analyzed on an individual basis to write a formal research paper in scientific style.

3. Describe nature and frequency of typical computational assignments if applicable; note if any are required:

Weekly laboratory exercises require the use of basic arithmetic and algebraic skills. Students will multiply, divide, solve fractions, compute percentages, manipulate linear equations and use formulae to calculate physiological measurements.

4. Describe other types of assignments that students may be asked to complete:

In preparation for some exams or lab work, students may use the library or internet resources to research relevant topics.

5. If course is degree applicable/transfer, describe those critical thinking skills that are required; be sure that they reflect course objective. (Title 5 requirements can be found in the AP&P Standards and Practices book.)

In class and home study, students will compare and integrate concepts from related systems or processes. On lecture exams, they will use physiological concepts to explain cause and effect and/or predict outcomes of hypothetical clinical scenarios.

In the laboratory, students will measure and analyze real laboratory data obtained in experimental settings, evaluate its accuracy, calculate values, correlate outcomes with lecture principles and formulate conclusions that can be used to prepare reports or answer questions on quizzes.

6. For categories 1-4 above, describe the estimated time per week it would take a student to complete typical out-of-class assignments. The Carnegie formula uses a 2:1 ratio as follows: 1 hr. lecture = 2 hrs. homework; 2 hrs. lecture = 4 hrs. homework; etc. For example: reading text—2 hours; writing reports—3 hour; etc.

Reading: At least 12 hours per week.

Writing: At least 3 hours per week.

Computational: Less than an hour per week.

Other: Library or internet research less than one hour per week.

METHODS OF INSTRUCTION: *(Methods must be consistent with content and appropriate to objectives; state in terms of what instructor will be doing in order to present course content to students.)*

Lecture supported with multimedia software or transparencies, printed lecture guides, computer animations and/or other audiovisual media.

Laboratory exercises or lab demonstrations utilizing live animals or human subjects and analog and digital instrumentation to illustrate physiological principles considered in lecture.

METHODS OF EVALUATION: *(These must be clearly related to course content, assignments, and objectives, in order to comply with Title 5 requirements. Describe what instructor will be looking for when evaluating assignments and tests in order to determine whether students have met course objectives. Grades must be based on demonstrated proficiency in subject matter and determined, where appropriate, by essays, objective and essay tests, research papers, problem solving exercises, or skills' demonstrations.)*

Three midterm lecture examinations and one final examination will be given to cover the objectives of each study area. Their format will include a true/false or multiple-choice section, a portion devoted to comprehension of terminology, and short answer questions and/or essay questions, some requiring critical interpretation of practical or clinical scenarios.

A laboratory quiz will be given or a report assigned each week when a lecture exam is not scheduled. These will cover the objectives and outcomes of each week's lab work.

A written report of a group laboratory project in endocrinology will be evaluated to its conformity with scientific format and how well the project's hypothesis is achieved and evaluated.

Suggested Texts or other Instructional Materials (*include title, author, publisher, date, and edition*):

Human Physiology – The Mechanisms of Body Function, Weidmaier, Raff and Strang. McGraw-Hill, Inc., 10th edition, ©2006.

Lab Exercises for Biology 202 – Human Physiology, Stephen Langjahr, 4th edition, ©2006.

Effective Date: _____

(date course can first be offered to be filled in by Office of Academic Affairs)