San Bernardino Valley College
Curriculum Approved: SP01

I. CATALOG DESCRIPTION

A. Department Information

Division:	Science Division
Department:	Biology
Course ID:	BIOL 250
Course Title:	Human Anatomy and Physiology I
Lecture:	3 hours
Lab:	3 hours
Units:	4
Prerequisite:	None.

B. Catalog Description:

First semester of a two-semester presentation of human anatomy and physiology for pre-professional major or others interested in an in-depth study of human biology. Introduction to cytology, histology, and basic inorganic and organic chemistry. Includes the structure, function, and homeostatic interrelationships of the integumentary, skeletal, cardiovascular, lymphatic, and respiratory organ systems.

Schedule Course Description:

First semester of a two-semester course in anatomy and physiology including the structure, function, and homeostatic interrelationships of the integumentary, skeletal, cardiovascular, lymphatic, and respiratory organ systems.

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: One

III. EXPECTED OUTCOMES FOR STUDENTS:

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

A. Build a conceptual framework that allows logical integration of information about the human body.
B. Identify the inter-relationships between the organs and processes studied.
C. Collect and evaluate laboratory data in written reports.
D. Apply vocabulary and concepts of anatomy and physiology to discussion of clinical situations.
E. Describe levels of organization in the human body.
F. Distinguish between living and non-living systems and list the characteristics of life.
G. Chemistry
   1. Compare and contrast the strictures and functions of the four major groups of organic molecules (proteins, lipids, carbohydrates, and nucleic acids).
   2. Diagram the structure of several biologically common atoms and molecules.
H. Homeostasis
   1. Diagram positive and negative feedback mechanisms and relate these to homeostasis in the human body.
   2. Explain the roles of water, salts, electrolytes, and pH in body homeostasis.
I. Cytology
   1. Discuss cell membrane transport, including passive and active processes.
   2. List the organelles of a cell and describe their functions.
   3. Compare and contrast the structure of DNA and RNA; describe the roles of each in protein synthesis.
   4. Name the stages of the life of a cell, including mitotic stages, and compare and contrast the mechanisms of mitosis and meiosis.

J. Histology
   1. List the characteristics used to classify tissues into one of the four major tissue groups (epithelial, connective/supportive, muscle, and nervous); identify the location and function of these in the human body.
   2. Name and describe the structure and function of cells, tissues and organs in the integumentary, skeletal, cardiovascular, lymphatic, and respiratory systems.

K. Critically evaluate how each of the listed major organ systems contributes to homeostasis in the human body.

IV. CONTENT

A. Introduction of the Human Body
   1. History of the study of human anatomy and physiology
   2. Definitions of anatomy versus physiology
   3. Levels of structural organization
   4. Life processes and homeostasis
   4. Anatomical position, directional terms, planes, sections, and body cavities

B. Chemical Levels of Organization
   1. Basic atomic structure
   2. Molecular bond types
   3. Molecular energy and types of reactions
   4. PH and buggers
   5. The role of water and other essential inorganic molecules
   6. The body's organic building blocks (carbohydrates, lipids, proteins, nucleic acids)

C. The Cellular Level of Organization
   1. Cell membranes
      a) structure and function
      b) active processes of movement across membranes
      c) passive processes of movement across membranes
   2. The nucleus
      a) RNA
      b) DNA
   3. The cytoplasm
      a) cytosol
      b) organelles
   4. Gene action
      a) transcription
      b) translation
   5. Cell division
      a) mitosis
      b) meiosis

D. Tissue Level of Organization
   1. Origins of tissues
   2. Epithelial tissues
   3. Connective and supportive tissues
   4. Nervous tissues

E. The Integumentary System
   1. Anatomy and physiology of the integument
      a) epidermis
      b) dermis
      c) hypodermis
   2. Skin Color
   3. Epidermal Derivatives
      a) Hair
      b) Glands
      c) Nails

4. Integumentary Homeostasis

F. The Cardiovascular System
   1. Blood components and functions
      a) red blood cell types
      b) white blood cell types
      c) plasma
      d) platelets
   2. Blood typing
   3. Hemostasis
   4. Anatomy and Physiology of the Heart
      a) Chambers, valves, and blood flow
      b) Conduction system and the EKG
      c) Cardiac output
   5. Anatomy and Physiology of Blood Vessels
      a) blood pressure and blood flow
      b) systemic, hepatic portal, pulmonary, and fatal circulation routes
   6. Hemodynamics and homeostasis
   7. The Cardiovascular System and Homeostasis

G. Lymphatic System
   1. Lymphatic vessels and lymph circulation
   2. Lympathic tissues
      a) vessels and nodes
      c) tonsils and adenods
      d) spleen
   3. The Role of the Lymphatic System in Homeostasis

H. The Respiratory System
   1. Gross anatomy and microscopic
   2. The physiology of respiration
   3. Control of respiration
   4. The respiratory system and homeostasis

V. METHODS OF INSTRUCTION:

A. Lecture
B. Demonstration
C. Multi-media, including video and overheads (Powerpoint and publisher-supplied)
D. Student study guides
E. Textbook reading
F. Laboratory projects
   1. Study the 206 human body bones and their pertinent surface features
   2. Experiments
   3. Microscopic examination of tissues
   4. Written lab reports

VI. TYPICAL ASSIGNMENTS:

A. Read the assigned chapter in the textbook. Then, describe the local of the heart and the structure and functions of the wall, chambers, great vessels and valves of the heart.
B. From observational data collected in lab, construct a bar graph showing the frequency of outcomes among the individuals participating in the activity. Analyze the result and form conclusions.
C. Complete the coloring, labeling, and diagramming exercise from the student study guide that relates to the scheduled lecture.
D. Search on-line for web sites related to class topics.

VII. EVALUATION:

A. Methods of Evaluation
   1. Examinations
      A. Sample question: Explain why Dr. Smith would suggest that a hypertensive patient restrict their salt intake.
      B. Sample question: Using the numbered diagram provided, indicate the proper pattern of blood flow through the heart.
   2. Quizzes
   3. Lab Reports
   4. Homework Assignments
   5. Bone Identification Practical Examination

B. Frequency of Evaluation
   1. 4 major exams (lecture)
   2. 2-3 quizzes (lecture)
   3. lab reports and quizzes (weekly)

VIII. TYPICAL TEXTS:

TEXTBOOKS

A. Tortura, Gerlad J. and Sandra Renyolds Brabowski. Principles of Anatomy and Physiology. 8th edition. New York: Harper Collins College Publishers. 1996.
B. Seeley, Rod R., et al. Anatomy and Physiology. 4th edition. Mosby Yearbook. 1998.
C. Van de Graff, et al. Concepts of Human Anatomy and Physiology. 4th edition. Wm. C. Brown Publishers. 1998.

STUDENT STUDY GUIDES

D. Prezbindowski, Kayhleen Schmidt and Gerald Tortora. Learning Guide for Tortura-Grabowski, Principles of Anatomy and Physiology. 8th edition. New York: Harper Collins College Publishers. 1998
E. Marieb, Elaine. The A & P Coloring Workbook: A Complete Study Guide. 3rd Edition. Redwood City, CA: Benjamin Cummings. 1991.
F. Harley, John P. Student's Study Guide to Accompany Harley and Noback Human Anatomy and Physiology. 2nd edition. New York: McGraw-Hill. 1992

LAB MANUALS

G. Michaelis, Kenneth A., et al. Laboratory Experiences in Human Physiology. 4th edition. Minneapolis: Burgess Publishing/Bellwether Press. 1988.

IX. OTHER SUPPLIES REQUIRED OF STUDENTS:

A. Scantron answer sheets
B. EKG electrodes
C. Respiratory mouthpiece

(Total cost about $5.00)