

Crafton Hills College

Course Outline

1. Discipline: Anatomy & Physiology
2. Department: Biological Sciences
3. Course Title: Essentials of Human Anatomy and Physiology
4. Course I.D.: ANAT 101
5. Prerequisite(s): None
Corequisite(s): None

Departmental
Recommendation(s): None

6. Semester Units: 4
7. Minimum Semester Hours:
Lecture: 48 Lab: 48 Clinic: 0 Field: 0
8. Need for the Course:

A&P 101 is designed for Biology and non-Biology majors. This course meets the general education requirement for graduation by providing for both lecture and lab sessions. A&P 101 meets the Anatomy and Physiology prerequisites for Allied Health training courses such as Respiratory Care, Paramedical training, LVN training, Medical Coding, Radiology, and Accredited Records Technician. This course does not meet the requirement for registered Nursing, Physician's Assistant, or Dental Hygiene training programs. These programs require the two-semester Human Anatomy & Physiology course.

9. Goals for the Course:

A&P 101 provides the student with a basic survey of the structure and functions of the human body. The student is introduced to the organization of the eleven body systems from the cellular level to the systemic level. The student is also introduced to the concepts of homeostasis and maintenance of health, from basic biochemistry to the body's ability to protect itself from pathogenic invasion.

These skills and concepts are essential for anyone entering any of the Allied Health professions. This course will provide a transfer level A&P for the CSU schools.

10. Catalog Description:

This is a lecture and laboratory course emphasizing the basic structural, functional, and developmental stages and clinical aspects of the human body. The course is an introductory survey of the human body in one semester. The essentials of structure and function will be included in each of the eleven body systems covered as well as the concepts of homeostasis.

11. Entrance Skills:

- A. Requisite Skills: Basic English Skills (read, write, analyze)
- B. Corequisite Skills: None
- C. Recommended Skills (for courses with Departmental Recommendations):
The students should be able to complete written assignments including essay testing, laboratory reports, and research assignments.

12. Course Objectives:

Upon completion of the course, students (in the classroom or practicum setting) will be able to do the following:

- (1) Define anatomy and physiology and explain how they are related. Using lab models, list the body cavities and organs.
- (2) List and define basic anatomical terms that relate to specific body areas.
- (3) Define and explain the concepts of homeostasis.
- (4) Explain how the study of the living body is dependent on chemistry.
- (5) List and describe the parts of the atom and how it interacts in chemical reactions.
- (6) Discuss the chemical experiments held in lab and explain how they can be related to the body's chemistry.
- (7) Define and explain pH and its effects on the body.

- (8) Using microscopy, explain how the structure of cells are related to their functions.
- (9) List and describe the general anatomical and physiological features of the cell.
- (10) Describe passive and active movement through the cell membrane.
- (11) Define selective permeability.
- (12) Explain what a tissue is and define the term histology.
- (13) List the four main types of tissue in the body.
- (14) Describe and list the functions of the cellular components of the four major tissues.
- (15) List and name the components of the integumentary system.
- (16) Name and describe the layers of the skin.
- (17) Discuss three factors that influence skin color.
- (18) Describe the accessory structures of the skin.
- (19) Discuss the structure and functions of the glands of the skin.
- (20) Discuss the five functions of the skeletal system.
- (21) Describe the macroscopic and microscopic structure of the bone.
- (22) Identify and classify bone according to size and shape.
- (23) Define osteogenesis and identify three cell types involved in two types of ossification.
- (24) Distinguish between the axial and appendicular skeletons and state the number of bones in each.
- (25) Compare the structure and function of the three types of joints.
- (26) Compare skeletal muscle tissue with visceral and cardiac muscle tissue.
- (27) List four characteristics of muscle tissue that relate to its function.

- (28) Describe and discuss the microscopic structure and function of the muscle cell.
- (29) Describe and discuss the neurological and physiological interaction of muscles.
- (30) List and describe the origin and insertion of muscles.
- (31) List and describe the action of major muscle groups.
- (32) Describe three types of nervous system functions and outline the organization of the nervous system.
- (33) Identify the two categories of cells in nervous tissues.
- (34) Classify neurons according to structure and function.
- (35) Describe membrane potentials and the events of impulse conduction.
- (36) Describe the structure and function of the brain, spinal cord, peripheral nervous system, autonomic nervous system, somatic and special senses.
- (37) Compare the actions of the endocrine and nervous system.
- (38) Discuss the importance of the endocrine system in regulating homeostasis.
- (39) Explain how the blood levels of hormones are regulated.
- (40) Describe the location, hormones, and functions of the endocrine glands.
- (41) Describe stress and discuss how stress and disease are related.
- (42) List the characteristics and functions of blood. Explain where and how blood is produced.
- (43) Describe the structure and functions of blood cells.
- (44) List the components of blood plasma and their importance.
- (45) Describe the actions of blood clotting and its importance.
- (46) Describe blood types and their relationship to transfusions.
- (47) Describe and diagram the structure and functions of the heart.

- (48) Describe mechanical and physiological functions of the heart.
- (49) Explain the factors that affect heart rate.
- (50) Describe the structure and functions of the blood vessels.
- (51) Explain how blood flows through blood vessels.
- (52) Explain how blood pressure is produced and what factors determine blood pressure.
- (53) Explain pulse rate and blood pressure and how they are measured.
- (54) Discuss how materials are exchanged between the blood and body cells.
- (55) Explain and describe the parts of the lymphatic system and their functions in maintaining homeostasis.
- (56) Explain the organization of the lymphatic system, fluid vessels, and organs.
- (57) Explain the various non-specific and specific mechanisms for maintaining immunity and homeostasis.
- (58) Identify the organs of the respiratory system and discuss their structure and functions.
- (59) Explain the mechanisms of breathing and the exchange of gases.
- (60) Explain the transport of gases within the systemic and pulmonary circulatory systems.
- (61) Explain how the nervous system controls breathing.
- (62) Define digestion and describe the processes involved in digesting food.
- (63) List and describe the structure and functions of the organs of the gastrointestinal (GI) tract.
- (64) Describe the processes of mechanical and chemical digestion.
- (65) Describe how food intake is regulated.
- (66) Define a nutrient and list the major groups.

- (67) Define metabolism and describe its importance to homeostasis.
- (68) Compare the sources, functions, and importance of the various nutrients in metabolism.
- (69) Explain how heat and metabolism are related.
- (70) List the structure and functions of the organs of the urinary system and describe how they help to maintain homeostasis.
- (71) Explain the physiological processes of urine formation and urine elimination.
- (72) Describe the normal and abnormal components of urine.
- (73) Describe the various fluid compartments of the body.
- (74) Explain the routes of fluid intake and fluid output and explain how intake and output are regulated.
- (75) Describe the functions and regulation of electrolytes and how they help to maintain pH.
- (76) Describe how water moves between fluid compartments.
- (77) Define reproduction and explain its significance.
- (78) Describe the organs of the reproduction systems of the male and female and list their structure and functions.
- (79) Describe and explain the functions of the male and female sex hormones.
- (80) Identify histological slides of various cells and tissues in the body.
- (81) Using anatomical models list and define the various anatomical features of cavities and organs.
- (82) Using the skeletons list and define the 206 bones in the body.

13. Representative Texts and Instructional Materials:

Shier, David, Jackie Butler, and Ricki Lewis. 1998. 6th ed. *HOLE'S Essentials of Human Anatomy and Physiology*. McGraw-Hill, Dubuque, Iowa. 617 pages.

Martin, Terry R. 1998. 6th ed. *HOLE'S Essentials of Human Anatomy and Physiology Laboratory Manual*. McGraw-Hill, Dubuque, Iowa. 360 pages.

OR

Marieb, Elaine N. 1997. 5th ed. *Essentials of Human Anatomy and Physiology*. Benjamin Cummings, Menlo Park, California. 502 pages.

Atsma, Bert, Leigh Rapaport Levitt, Richard E. McKeeby, and Jessica Potell Sand. 1999. 1st ed. *Essentials of Anatomy and Physiology Laboratory Manual*. Benjamin Cummings, Menlo Park, California. 170 pages.

14. Course Content:

- (1) Introduction to anatomy and physiology including levels of organization, organ systems, life processes, homeostasis, and anatomical terminology.
- (2) The biochemistry of life; matter and elements; chemical bonds, compounds and molecules; chemical reactions; mixtures, solutions and suspensions; acids, bases and buffers; and organic and inorganic compounds.
- (3) The anatomy and physiology and the eukaryotic cell.
- (4) Cellular metabolism and concepts of anabolism versus catabolism.
- (5) The structure and functions of the histology of tissues and membranes.
- (6) Histological study of the integumentary system including the structure and function of skin, skin color, epidermal derivatives, dermis and subcutaneous tissues.
- (7) Osteological study of the skeletal system. The macroscopic and microscopic study of bone, both structure and function. This includes the axial skeleton, appendicular skeleton, joints, and articulations.
- (8) Myological study of the characteristics and functions of the muscular system. This includes the microscopic study of muscle cells and tissue, contraction of the muscle cell, skeletal, cardiac, and smooth. The macroscopic study of muscles and muscle groups, their structure and functions.
- (9) Neurological study of the structure and functions of the nervous system, its organization, nervous tissue, and nerve impulses.

- (10) The sensory system: its structure; functions of sensory receptors; sensations; both general and special senses.
- (11) The endocrine system: its glands and hormones; and characteristics of homeostatic control of metabolism.
- (12) The cardiovascular system: blood functions and characteristics; composition of blood; hemostasis; blood typing and transfusions; the heart, its structure and functions; the blood vessels, their classification, structure, and functions; physiology of circulation and circulatory pathways.
- (13) The lymphatic and immune systems: their structural and physiological components; and protective mechanisms for resistance to pathogenic organisms.
- (14) The respiratory system: functions and structural overview; basic gas laws and respiration; regulation of respiratory system; and transport of gases.
- (15) The digestive system: functions and overview of digestion; basic structure of the gastrointestinal tract; regions of digestive tract; accessory organs; mechanical and chemical digestion; absorption and nutrition.
- (16) The urinary system and body fluids: function and structural components; urine formation; characteristics of urine; fluid/electrolyte balance; and acid-base balance.
- (17) The male and female reproductive systems: development, structure, and functions; sexual characteristics; sexual activity; and pregnancy.

15. Methods of Instruction:

The course combines lectures, class discussions, audio-visual presentations, correlated laboratory sessions, laboratory reports, reading (textbooks and scientific journals). The students apply the skills learned during laboratory sessions for the laboratory practicum testing.

Students are required to pass quizzes and examinations in both objective and subjective formats, including essay, multiple choice, true/false, and complete oral recall and identification.

16. Assignments and Methods of Evaluation:

- (1) Objective examinations (lecture and laboratory).

- (2) Quizzes
- (3) Laboratory practicum
- (4) Reading reports (Scientific American articles and others)
- (5) Oral checkout quizzes in lab testing learning and recall

Exams	25%	A's	90%+
Labs	30%	B's	80%+
Lab Practicals	15%	C's	70%+
Quizzes	10%	D's	60%+
Final Exam	20%	F's	59% or less