I. COURSE
BIOL 221-1 Human Structure and Function
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II. COURSE DESCRIPTION
A survey of human anatomy and function, with emphasis on physical performance. This course is a prerequisite for PHED 441 and SWK 271. Content includes two hours of anatomy and two hours of physiology. Three lectures and one 2-hour lab.

III. COURSE PURPOSE
This course is designed to give the student an overview of human anatomy and the functions of the major organ systems.

IV. COURSE OBJECTIVES
A. Course Aims:
1. To provide a sufficient background, vocabulary, and proficiency in human anatomy to those students planning careers in the health sciences, sciences and education.
2. To understand and appreciate how the human body corresponds to the anatomy of other vertebrates
3. To provide a basic understanding and appreciation of the gross morphology, anatomy and basic functions of the human body components and their interrelationships.
B. Goals & Objectives - Upon course completion, students will/shall be able to:
1. Explain the characteristics, classification of humans and the body organization and terminology.
   a. Describe cells, tissues, organs and organ systems.
   b. Explain the concept of homeostasis and give an illustration of a homeostatic system in the human body.
   c. Describe anatomical position and describe, using proper terminology, the surfaces, planes, regions and cavities of the human body and what organs occupy those cavities.
2. Describe a cell, a cell's cycle and the processes of multiplication of cells.
   a. Identify and define a cell's parts (organelles) and list a function of each.
   b. Identify and/or describe the phases of cell multiplication by somatic cell division (mitosis).
3. Understand the concept of histology as it relates to the four basic tissues: epithelial, connective, muscular, and nervous.
   a. Know the distinguishing cellular characteristics of the special types of tissue and be able to give the location and function of each specific tissue type in the body.
   b. Define, give examples of and describe the method of secretion of exocrine, endocrine, and mixed glands.
4. Explain the histology and functions of the skin's epidermis, dermis, and subcutaneous layers (Integument).
   a. Describe the structure and function of epidermal derivatives
   b. Explain cellular replacement and the determination of skin color.
5. Understand the histology and anatomy of the skeletal system.
   a. Describe the composition and development of osseous (bony) tissues and organs
   b. Describe the structural organization of the skeletal system and list the components of the axial and appendicular portions.
   c. Contrast the structural and functional classification of joints.
   d. Describe the types of movement possible at diarthrotic joints.
   e. Identify the bones of the skeleton, their surfaces, parts, articulations and movements or lack of movements at various articulations (joints).
   f. Describe gender (sex) skeletal differences and changes that occur in the skeleton with increasing age.
6. Recognize the histology and general physiology of the muscular system.
   a. Describe the comparative cellular anatomy of skeletal, cardiac, and smooth (visceral) muscle tissue and general functions of each.
   b. Describe the ultrastructure of a striated muscle fiber and explain the sliding filament theory of muscle contraction.
   c. Identify by name, location and action, the superficial muscles of the human (a muscle list will be provided).
7. Understand the role of the Nervous and Endocrine systems in communicating and responding to changes in the external and internal environment.
   a. Identify the cellular and organ components of the nervous system including anatomy and function of the central and peripheral (cranial, spinal, and autonomic) nervous system
1) Describe and give the functions of various neurons and neuroglia
2) Describe the development and organization of the nervous system.
3) Describe the characteristics of a nerve impulse and the synapse.
4) Describe the spinal cord and a withdrawal reflex.
5) Identify the parts of the brain and functions of each.
6) Describe meninges, the ventricles, choroid plexus and the circulation of cerebral spinal fluid.
7) Know the numbers, names, general and specific functions of the twelve pairs of cranial nerves.
8) Know the components and comparative anatomy and general physiology of the sympathetic (thoracolumbar) and parasympathetic (craniosacral) parts of the autonomic nervous system.
   b. Compare and contrast somatic visceral and special senses.
   c. Describe the cutaneous receptors and the posterior column and lateral spinothalamic pathways.
   d. Describe the chemoreception of gustatory and olfaction.
   e. Describe the eye and visual pathway.
   f. Describe the ear and functions of hearing and balance.
   g. Identify and locate the major endocrine glands. Name and describe the major hormones from each gland and their functions as they affect the metabolism of other target cells, tissues, organs, or organ systems. Relate hormones to the concept of homeostasis.
8. Identify and describe the general histology of the major anatomical components of the digestive and respiratory systems; and explain the general physiology associated with each system and organ of that system.
   a. Identify gross anatomy and components of the digestive tract and accessory digestive organs.
   b. Describe the membranes and parts of other organ systems closely related (anatomically and/or physiologically) to the parts of these organ systems.
   c. Define food, digestion and how and where digested food gets into the body.
   d. Identify the anatomy and composition of the parts of the respiratory system and associated structures.
   e. Define or describe the four phases of respiration (ventilation-breathing, external, internal, and cellular).
9. Describe the general histology and anatomy of the Circulatory system and its functions in the body.
   a. Compare the histology and function of arteries, veins, capillaries.
   b. Identify the external and internal parts of the heart and major blood vessels, and describe the pathway of blood through these components (including heart chambers and valves).
   Describe the components of the fetal circulation and compare the pathway of fetal circulation with that of the adult.
   d. Identify and describe the composition and cytology of blood and lymph. Describe the structure and function of each blood cell type and describe the origin and roles of T and B lymphocytes in immunity.
   e. Identify the structure and function of the components of fetal circulation.
   f. Identify and describe the general histology of the major components and lymph flow through the lymphatic system.
10. Understand the anatomy and physiology of the excretory (Urinary) system as it relates to the regulation of fluid, electrolyte and acid-base balance of the body.
   a. Identify the histology and anatomy of the major components of the urinary system.
   b. Describe the ultrastructure of a nephron.
   c. Describe the pathway of renal circulation.
   d. Describe the processes of filtration, reabsorption, secretion, and excretion that occur in the urinary system.
11. Understand how the anatomy and general physiology of the reproductive system is related to the perpetuation of the species.
   a. Describe the structure and function of the components of both male and female reproductive tracts and related structures, and recognize their homologies.
   b. Describe the general physiology of reproduction, including the menstrual cycle, conception, implantation, gestation (each trimester), and parturition (birth).
   1) Describe the early stages of embryological development.
   2) Describe the formation and derivatives of the primary germ layers.
   3) Describe the formation and function of the extra-embryonic (fetal) membranes (esp. amnion and chorion).
   4) Know the origin, histology and functions of the placenta.
   5) Name and give the function of the hormones involved in birth and their function after birth.

V. COURSE METHODS AND PROCEDURES
   A. Lecture
   B. Video
C. Class discussion
D.Assigned textbook readings
E. Quizzes and tests
F. Computer labs: ADAM software
G. Workbook Assignments

VI. COURSE REQUIREMENTS
A. Attendance and participation:
   Regular class attendance is required. This course is highly interactive through lecture, discussion and computer lab time. Late assignments or missed quizzes and test due to unexcused absence will result in loss of points. There is no quiz or test make-up. Only verified medical emergencies or family deaths will excuse students from taking tests on test day. These are the only two exceptions and the student must notify teacher before test day not after returning. Students involved in extra-curricular activities at Evangel should plan in advance of an out of town event. Students must attend class on test days to get points. Attendance is required when student teaching assignments are scheduled. Three tardies constitute an absence. Exceeding maximum number of cuts as stated in the handbook will result in being dropped from class.

B. Lab participation:
   All students are required to participate in lab activities. Laboratory classes are designed to provide students with more hands on learning. It is the responsibility of the student to spend that time learning the required material. Students will be tested over all material presented in lab.

C. Workbook Assignments:
   All students will complete assignment by due date for credit. Assignments will be graded as complete only (10 pts.), partially completed assignments or late assignments will not be graded.

VII. EVALUATION

Classroom:
A. Four unit tests 4 @ 100 points
B. Chapter Outlines 15 @ 10 points
C. Workbooks 15 @ 10 points

   700 points

Lab:
A. Two test 2 @ 100 points
B. Quizzes 10 @ 10 points

   300 points

Maximum Points 1000 points

D. Grading Scale
   900-1000 A
   800-899 B
   700-799 C
   600-699 D
   599 or less F