BIO 210 - HUMAN ANATOMY

Units Lecture	2.00	**Units Lab**	2.00	**Units Total**	4.00
Total Hrs Lecture	33.00	**Total Hrs Lab**	99.00	**Total Course Hrs**	132.00

COURSE DESCRIPTION

This course follows a systemic approach by combining microscopic studies of tissues (histology) and organs along with gross/visual anatomical studies of the human body. Students learn dissection techniques by working with preserved mammalian specimens, including human cadavers. Because the course presents applied clinical situations, it is recommended for students majoring in the allied health field, massage therapy, kinesiology, and physical education.

ENROLLMENT RESTRICTIONS

PREREQUISITES	***COREQUISITES***	***ADVISORIES***
BIO 101, BIO 100, or a minimum 3-unit course in biology that presents principles of cellular life in its curriculum.		

OUTLINE OF COURSE CONTENT

The course will address the following topics:

Lecture:
I. The cell
A. Biochemistry
B. Organelles
C. Structure and function.

II. Histology
A. Classification of tissues
B. Tissue types.

III. Skeletal system
A. Microscopic and gross anatomy of bones
B. Bone development
C. Articulations.

IV. Muscular system
A. Classification of cells and their characteristics
B. Muscle development
C. Identification, actions, origins, and insertions of skeletal muscles.

V. Nervous system
A. Classification of cells and their characteristics
B. Development
C. Neural pathways
D. General and special senses.

VI. Digestive system
A. Histology of alimentary tract regions
B. Identification and function of digestive organs
C. Development.

VII. Respiratory system
A. Histology of respiratory tract regions
B. Identification and functions of respiratory organs

C. Development.

VIII. Cardiovascular system
A. Heart: histology and gross anatomy
B. Vessels: types, functions, and distinguishing characteristics
C. Development of the heart
D. Blood cells.

IX. Lymphatic system
A. Organs: location, functions, and introductory histology
B. Lymphatic pathways.

X. Urinary system
A. Organs: location and functions
B. Histology of urinary organs (emphasis on kidney).

XI. Reproductive system
A. Gonads
B. Male ducts and glands: location and functions
C. Female ducts and glands: location and functions.

XII. Integumentary system
A. Histology of the epidermis, dermis, hypodermis, and accessory structures
B. Functions of the epidermis, dermis, hypodermis, and accessory structures
C. Skin disorders.

XIII. Effects of aging and dysfunction/disease of organ systems
A. Integumentary system
B. Skeletal system
C. Muscular system
D. Cardiovascular system.

Lab:
I. Microscopic study of tissue types
A. Epithelial
B. Connective
C. Muscular
D. Nervous.

II. Integumentary system histology

III. Skeletal system
A. Histology and development
B. Gross anatomy: fetal and adult human and cat
C. Identification of articulations (joints).

IV. Muscular system
A. Histology
B. Gross anatomy: adult human (models and cadaver)
C. Dissection of mammalian specimen (cat, rabbit, or fetal pig).

V. Nervous system and special senses
A. Histology
B. Gross anatomy: adult human (models and cadaver)

C. Dissection of muscles in mammalian specimen.

VI. Digestive system
A. Histology and development
B. Gross anatomy: adult human (models and cadaver)
C. Dissection of mammalian specimen and sheep brain.

VII. Respiratory system
A. Histology and development
B. Gross anatomy: adult human (models and cadaver)
C. Dissection of mammalian specimen.

VIII. Cardiovascular system
A. Histology and development
B. Gross anatomy: adult human (models and cadaver)
C. Dissection of mammalian specimen and heart.

IX. Lymphatic system
A. Histology and development
B. Gross anatomy: adult human (models and cadaver)
C. Dissection of mammalian specimen.

X. Urinary system
A. Histology and development
B. Gross anatomy: adult human (models and cadaver)
C. Dissection of mammalian specimen.

XI. Reproductive system
A. Histology and development
B. Gross anatomy: adult human (models and cadaver)
C. Dissection of mammalian specimen.

XII. Introduction to histopathology: Microscopic and gross study of diseased organs from selected organ systems.

PERFORMANCE OBJECTIVES

Upon successful completion of this course, students will be able to do the following:

1). Compare and contrast mammalian body structures
2). Outline and summarize dissection techniques
3). Construct and implement a dissection plan following the systemic approach
4). Display fundamental skills in microscope use
5). Inspect slides of tissue sections (histology), relating tissue microstructure to organ macrostructure
6). Inventory major bones, muscles, organs, and vessels of the body, describing their structure, basic function, and integration with other systems
7). Distinguish between organs and tissues in health and disease states
8). Describe age-related changes to selected organs/organ systems
9). Articulate and compare the anatomy of a human organ with that of a cat or other mammal.

READING ASSIGNMENTS

Reading assignments will be consistent with, but not limited by, the following types and examples:

1). Identify and understand the relationship between assigned anatomical structures through reading in the textbook
2). Read the laboratory manual in order to prepare for dissections and histological examination of organs and tissues
3). Read selected articles (journal and online) that provide current information on anatomical changes associated with aging and disease states.

WRITING ASSIGNMENTS

Writing assignments will be consistent with, but not limited by, the following types and examples:

1). Write essays that evaluate differences in gender, developmental changes and the effects of aging on organ systems
2). Employing appropriate anatomical terminology and complete sentences, write descriptive essays that accurately trace the movement of materials through an organ system, such as blood through the cardiovascular system, air through the respiratory system, etc.
3). Create a dissection plan identifying the appropriate methods, techniques, and anatomical terminology required to perform such a task.

OUTSIDE-OF-CLASS ASSIGNMENTS (READING/WRITING/OTHER)

Outside-of-class assignments will be consistent with, but not limited by, the following types and examples:

1). Read assigned chapters in the text, identifying key words and concepts
2). For each lab unit, read appropriate lab manual section, identifying key structures
3). Relate each dissection to key structures identified on a lab worksheet
4). Correlate affected anatomy with certain diseases
5). Describe in writing changes to organ systems that occur with age
6). Collaborative learning assignment: in groups, address a topic related to a clinical situation, such as a disease, and research the anatomy involved. Present results in a prepared group presentation.

STUDENT LEARNING OUTCOMES

Learning Outcome	*Mode of Assessment*
1. Given a histological section of an organ (microscopic view), students will be able to distinguish which tissue types are present and justify the organization of those tissues based upon their functional roles.	1. Lab Practicum
2. Students will demonstrate appropriate dissection techniques on preserved specimens, applying a systemic approach.	2. Lab Practicum
3. Evaluate how the differences among people affect the structure and function of the human body.	3. Essay question on written exam.

METHODS OF INSTRUCTION

Instructional methodologies will be consistent with, but not limited by, the following types or examples:

1). Lectures will guide students through the identification of cellular, histological, organ, and organ system components of the human body.
2). Students will practice collaborative learning methods in the laboratory by planning and performing dissections and assisting each other in the identification of assigned anatomical structures in models and preserved specimens.
3). Students will practice their critical thinking skills in the laboratory by analyzing the interactions of various organs and organ systems.
4). Instructors will interact with small groups of students during demonstrations of the anatomy of organs and tissue specimens. During these small-group interactions, students will participate by describing and identifying structures designated by their instructor. Immediate feedback will be provided by the instructor, thus contributing to student learning.
5). Students will be required to draw gross and microscopic anatomical structures.
6). Students will use multi-media from both the textbook publisher and internet resources to aid in identification and understanding of the relationships between anatomical structures.

METHODS OF EVALUATION

Evaluation methodologies will be consistent with, but not limited by, the following types or examples:

1). Substantial writing assignments that reflect critical and creative thinking through the analysis of the development of organs, how the aging process affects the structure and function of organ systems, and appropriate methodoligies of dissection of specimens.
2). Students will be evaluated by both peers and their instructor with respect to their contribution to dissection of specimens.

3). Students will be tested on their knowledge of human anatomy through written examination, which includes multiple choice and essay questions that require critical thinking and problem-solving skills. Essay answers will be evaluated on the basis of logical organization, appropriate use of specific terminology, and knowledge of subject matter.
4). Practical examinations will test students on their ability to visually identify structures and apply appropriate terminology in their answers.
5). Group dissection of specimens will be evaluated on the students' ability to plan the dissection, use appropriate technique during dissection, and to locate and expose structures without damaging them.

REQUIRED TEXTBOOKS

Examples of typical textbooks for this course include the following:

1). Eder, Douglas, et al. Laboratory Atlas of Anatomy and Physiology. 6th ed., McGraw-Hill, 2009. ASIN: B0030MYBIW
2). Eroschenko, Victor P. diFiore's Atlas of Histology with Functional Correlations. 12th ed., Lippincott Williams & Wilkins, 2012. ISBN: 978-1451113419
3). Martini, Frederic H., et al. Human Anatomy. 7th ed., Benjamin Cummings, 2011. ISBN: 978-0321688156
4). Van De Graaf, Kent M., et al. A Photographic Atlas for Anatomy & Physiology Laboratory. 6th ed., Morton, 2007. ISBN: 978-0895826985

OTHER REQUIRED INSTRUCTIONAL MATERIALS

1). Kapit, Wynn, and Lawrence M. Elson. The Anatomy Coloring Book. 3rd ed., Benjamin Cummings, 2001. ISBN: 978-0805350869

COURSE REPEATABILITY

Total Completions Allowed:	***In Combination With:***
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