I. **OVERVIEW**  
The following information will appear in the 2012 - 2013 catalog

**ANAT 125  Human Anatomy**  
5 Units

**Prerequisite:** Satisfactory completion of BIO 116 or BIO 111 or BIO 101.

Study of human body structures including organ, tissue and cellular interrelationships.  Involves extensive use of models, specimens, histological material, and dissection. Cadaver materials and demonstrations are used. Intended for students entering the health professions.

Field trips might be required.  (A-F or P/NP - Student choice) Lecture /Lab /Discussion

**Transfer:** (CSU, UC) **General Education:** (MJC-GE: A ) (CSU-GE: B2, B3 ) (IGETC: 5B )

II. **LEARNING CONTEXT**  
Given the following learning context, the student who satisfactorily completes this course should be able to achieve the goals specified in Section III, Desired Learning:

A. **COURSE CONTENT**

1. **Required Content:**

   a. **Introduction**
      
      i. The body plan, planes, cavities, anatomical position, terminology
      
      ii. Levels of organization

   b. **Cells**
      
      i. Generalized cell
      
      ii. Plasma membrane
      
      iii. Cytoplasm
      
      iv. Organelles
      
      v. Cell division

   c. **Tissues**
      
      i. Basic microscopy
      
      ii. Epithelial tissue
      
      iii. Connective tissue
      
      iv. Membranes
      
      v. Muscle tissue
d. Nervous tissue
   i. Integumentary System
   ii. Skin
   iii. Epidermal derivatives

e. Skeletal System
   i. Gross structure and classification of bones
   ii. Histology of osseous tissue
   iii. Development and growth of bone
   iv. Structure and classification of joints

f. Muscular System
   i. Histology of muscle tissue
   ii. How skeletal muscle produces movement
   iii. Principal skeletal muscles

g. Cardiovascular System
   i. Physical characteristics of blood
   ii. Formed elements of blood
   iii. Anatomy of the heart
   iv. General scheme of circulation
   v. Function and anatomy of blood vessels

h. Lymphatic system

i. Nervous System
   i. Histology of nervous tissue
   ii. Spinal cord and spinal nerves
   iii. Brain
   iv. Cranial nerves
   v. General senses and sensory and motor pathways
   vi. Special senses
   vii. Autonomic nervous system

j. Endocrine System
   i. Histology of endocrine glands
ii. Major endocrine glands

k. Respiratory System
   i. Organs of respiration
   ii. Histology of respiratory system
   iii. Mechanics and control of pulmonary respiration

l. Digestive System
   i. Basic histology of the digestive system
   ii. Parts of the gastrointestinal tract and accessory structures

m. Urinary System
   i. Parts of the urinary system
   ii. Gross anatomy of the kidney
   iii. Microstructure of the kidney

n. Reproductive System
   i. Histology of the reproductive system
   ii. Essential and accessory structures of the female reproductive system
   iii. Essential and accessory structures of the male reproductive system
   iv. Uterine and ovarian cycles

2. Required Lab Content:

   The lab content is the same as the course content but structures and organs covered in the lecture are examined and located on models, slides, cadavers and dissected materials. Lab provides the hands-on part of the course.

   a. Introduction
      i. The body plan, planes, cavities, anatomical position, terminology
      ii. Levels of organization of life

   b. Cells
      i. Generalized cell
      ii. Plasma membrane
      iii. Cytoplasm
      iv. Organelles
v. Cell division

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   i. Basic microscopy
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B. ENROLLMENT RESTRICTIONS

1. Prerequisites
   Satisfactory completion of BIO 116 or BIO 111 or BIO 101.

2. Requisite Skills
   Before entering the course, the student will be able to:
a. Use the scientific process in problem solving.
b. Use binocular compound and dissecting microscopes.
c. Make and label accurate drawings of items observed.
d. Work with other students in problem solving situations

e. Use the language of biology and anatomy as it relates to orientation and direction, planes and sections, cavities, and surface anatomy.
f. Use the language of biology and physiology as it relates to homeostatic mechanisms.
g. Describe general cell structure and explain the organization and anatomical inter-relationships of major membranous and non-membranous organelles.
h. Describe and explain general cell functions, including cellular communication, cellular movement, membrane transport, metabolism, and protein synthesis.
i. Describe and explain the role of DNA and gene expression in the function and action of cells.
j. Name and describe the major categories of tissues and explain the relationship between cells and tissues.
k. Name and describe major organ systems and their corresponding organs and explain the relationships between organs, tissues and cells.

C. HOURS AND UNITS

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<tr>
<th>INST METHOD</th>
<th>TERM HOURS</th>
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D. METHODS OF INSTRUCTION (TYPICAL)

Instructors of the course might conduct the course using the following method:

1. Lecture along with visual aids.
2. Specific lab objectives will be carried out through the study of models, microscope slides, student dissected specimens or on cadavers.
3. Students will be required to perform microscope operation and dissection skills under direct supervision of instructor or lab assistant.

E. ASSIGNMENTS (TYPICAL)

1. EVIDENCE OF APPROPRIATE WORKLOAD FOR COURSE UNITS

   Time spent on coursework in addition to hours of instruction (lecture hours)

   a. Students study their weekly histological and/or specimen drawings for lab practicums.
   b. Students use their drawings, study guide materials, and textbook to identify and rehearse anatomical features and structural interrelationships on a daily basis.
   c. Students study for weekly quizzes and bimonthly lecture exams and lab practicums in group work outside of class.
2. **EVIDENCE OF CRITICAL THINKING**

Assignments require the appropriate level of critical thinking

1. In the laboratory and in exams, students are given anatomical specimens to compare and evaluate variations in anatomical structure.

   Example: In the laboratory students are given a prosection of a cadaver arm and asked to distinguish the muscles that extend the pollex (thumb) from the muscles that abduct the thumb, and to explain why these muscles have different actions.

2. In the laboratory and in exams, students are given questions to explain how anatomical structure serves the functional purposes of the various organs.

   Example: In an exam students are asked to identify layers of skin, identify the tissues found in these layers and explain the purpose of these tissues. In the laboratory practicum portion of an exam, microscopes are set up with pointers on specific layers of skin. "Name the layer of skin at the tip of the pointer in the right eyepiece." "Name the tissue or tissues found in this layer of skin." In the scantron portion of the corresponding exam questions are asked such as, "Stratified squamous epithelia function to A) provide a strong barrier, B) protect the body from external contaminants, C) support blood vessels, D) A and B, E) All of the above.

3. In the laboratory and in exams, students discuss how anatomical structure relates to clinical problems that are based on anatomy.

   Example: In an exam students are asked, "Explain how loss of vision in the right visual field of each eye could be related to a tumor of the pituitary gland."

4. In the laboratory and in exams, students predict the functional limitations of the body based on an analysis of structure.

   Example: In the laboratory students are given several bones of the appendicular skeleton and asked to identify which joints allow flexion anteriorly and which joints allow flexion posteriorly.

F. **TEXTS AND OTHER READINGS (TYPICAL)**


III. **DESired LEARNING**

A. **COURSE GOAL**

As a result of satisfactory completion of this course, the student should be prepared to:

   identify gross and microscopic anatomical structures of the human body as preparation for prerequisite and requisite coursework for allied health professions.

B. **STUDENT LEARNING GOALS**

Mastery of the following learning goals will enable the student to achieve the overall course goal.

1. **Required Learning Goals**

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

   a. Define the levels of structural organization that make up the human body.

   b. Explain the structure and functions of the plasma membrane.

   c. Describe the structure and functions of the cellular organelles.

   d. Identify the distinguishing characteristics of the different types of tissue.
e. List the various layers of the skin and describe the epidermal derivatives.

f. Identify the bones of the skeleton and the major markings associated with each.

g. Describe the histological features of compact and spongy bone tissue.

h. Compare and contrast the structural and functional classification of joints.

i. Compare and contrast the histology and function of the three types of muscle tissue.

j. Identify the skeletal muscle in various regions of the body.

k. Identify the external and internal anatomy of the heart.

l. Describe the flow of blood through systemic and pulmonary circulations.

m. Compare and contrast arteries, arterioles, capillaries, venules and veins.

n. Describe the components of the lymphatic system and list their functions.

o. Identify the principal parts of the spinal cord and brain.

p. Identify the cranial nerves by name, number, function and location.

q. Locate and describe the receptors and structures associated with special senses.

r. Compare and contrast the sympathetic and parasympathetic divisions of the autonomic nervous system.

s. Describe the location, histology, and blood and nerve supplies of endocrine glands.

t. Identify the organs of the respiratory system.

u. Compare and contrast the functional histology of different regions of respiratory system.

v. Describe the histological structure of the gastrointestinal tract.

w. Identify the organs of the gastrointestinal tract and explain their functions.

x. Identify the organs of the urinary system.

y. Describe the external and internal gross and microanatomy of the kidney.

a`. Describe the location, structure, histology and function of the sexual organs.

aa. Name the principal regions of the body that are examined in surface anatomy.

2. **Lab Learning Goals**

   **Upon satisfactory completion of the lab portion of this course, the student will be able to:**

   a. Identify using slides and models the histology and structures of skin.

   b. Learn to use the microscope, identify the parts and their functions.

   c. Identify organelles on models and recognize stages of mitosis.

   d. Compare and contrast various epithelial and connective tissue histology.

   e. Identify the various bones and their bone markings of the entire skeletal system.

   f. Identify location, origin, insertion and action of the major muscles of the body using models and the cadaver.
Locate major parts of the heart on models and on a pork heart dissection.

Locate and name major arteries and veins and their histological parts.

Identify the various components of blood and their functions.

Identify lymphatic system organs and structures.

Identify respiratory histology and major organs on models and the cadaver.

Identify parts of the spinal cord, spinal nerves, brain, and cranial nerves on models and specimens.

Distinguish the differences between neurons and neuroglia and identify the parts of a general neuron.

Perform dissections of sheep brains and compare features to human brains.

Identify anatomy of eye and ear. Draw histology of the eye and ear.

Identify on slides the pancreas, adrenal gland, thyroid gland and pituitary gland.

Describe the major structures of the digestive system on models and the cadaver.

Illustrate the histological structures of the digestive system using microscope and models.

Assess the differences in the structures of the male and female reproductive systems using models and cadavers.

Identify the histological and macroscopic structures of the urinary system.

IV. METHODS OF ASSESSMENT (TYPICAL)

A. FORMATIVE ASSESSMENT

1. Student drawings in the laboratory are examined on a daily basis to assess progress in identifying anatomical structures.

2. Lecture and laboratory quizzes on a weekly basis assess progress in identifying anatomical structures and explaining anatomical interrelationships.

3. Exams on a tri-weekly basis (lab practicum, multiple choice, short answer, and short essay) assess accumulative learning.

B. SUMMATIVE ASSESSMENT

1. Exams on a tri-weekly basis (lab practicum, multiple choice, short answer, and short essay) assess accumulative learning.

2. A comprehensive final exam assesses integration of accumulated learning.