COURSE NUMBER & TITLE: BIOL 1270: Human Anatomy and Physiology:
Support, Movement, and Control

CREDITS: 4 (3 Lec / 1 Lab)
PREREQUISITES: None

CATALOG DESCRIPTION:
Human Anatomy and Physiology 1 is the study of organ systems and tissues of the human body. Systems included are the integumentary, skeletal, muscular, nervous, and endocrine. Focus is on structures and the integrated control mechanisms of physiology in these systems. This course is intended for students in health-related fields as well as liberal arts students. MNTC goal area: (3) Natural Science

OUTLINE OF MAJOR CONTENT AREAS:
1. Overview of anatomy and physiology
   A. Structural organization
   B. Functional characteristics
   C. Homeostasis
2. Basic chemistry and biochemistry
   A. Bonds and reactions
   B. Acids, bases, and salts
   C. Organic compounds
3. Cells and tissues
   A. Membranes
      1. Transport
      2. Electrical potential
      3. Cell interactions
   B. Epithelium
      1. Type
      2. Location
      3. Function
   C. Connective tissue
   D. Muscle tissue
   E. Nervous tissue
   F. Tissue repair
4. Integumentary system
   A. Epidermis
   B. Dermis and skin color
   C. Hair, nails, and glands
   D. Functions of skin
1. Protection
2. Temperature regulation
3. Secretion
4. Synthesis

5. Skeletal system
   A. Structure of bone
   B. Bone development and growth
   C. Calcium regulation
   D. Remodeling and repair
   E. Skeletal anatomy
   F. Joint anatomy

6. Muscular system
   A. Skeletal muscle anatomy
   B. Muscle and muscle fiber contraction
      1. Single fiber contraction
      2. Motor unit coordination
   C. Muscle metabolism
      1. Effects of exercise
      2. Comparison of smooth muscle
   D. Skeletal muscle physiology
   E. Muscle-bone-joint relationships
      1. Lever systems
      2. Movements at synovial joints

7. Nervous system
   A. Organization of the nervous system
   B. Neurophysiology
      1. Synapse
      2. Neurotransmitters
   C. The brain and spinal cord
   D. Peripheral nervous system
      1. Receptors
      2. Motor endings
      3. Cranial nerves
      4. Spinal nerve reflexes
   E. Autonomic nervous system
      1. Sympathetic division
      2. Parasympathetic division
      3. Interactions and control
   F. Special senses
      1. Taste and smell
      2. Eye and vision
      3. Ear: hearing and balance

8. Endocrine system
   A. Hormones
1. Target cell specificity
2. Mechanisms of action
3. Control of hormone release

B. Endocrine organs
   1. Pituitary gland
   2. Hypothalamus interactions
   3. Other glands
   4. Integration and regulation

**COURSE GOALS/OBJECTIVES/OUTCOMES:**

1. Students will describe the structural organization and major functions of the following human organ systems: integumentary, skeletal, muscular, nervous, endocrine.
2. Students will discuss mechanisms for maintaining homeostasis and the consequences of imbalance in the above systems.
3. Students will identify and distinguish individual tissues, bones, muscles, central and peripheral nervous system structures and understand their role in each organ system.
4. Students will explain the chemical and cellular interactions that govern major physiological processes, including sliding filament theory, tissue repair, reflex arcs, hormone balance, sensory reception, melanin production, and bone formation and remodeling.
5. Students will relate joint structure and muscle action to physical properties of velocity, force, endurance, and lever systems.
6. Students will differentiate the divisions within the nervous and endocrine systems, and relate their mechanisms to control over body functions.

**MNTC GOALS AND COMPETENCIES MET:**

Natural Sciences

**HCC COMPETENCIES MET:**

Working Productively and Cooperatively
Communicating Clearly and Effectively
Thinking Creatively and Critically
Practicing Cultural, Economic, and Environmental Sustainability

**STUDENT CONTRIBUTIONS:**
Students are expected to attend all laboratory sessions, participate in and contribute to class discussions, complete all assignments on time, and request assistance when needed. Attendance is critical for the successful completion of this course.

SPECIAL ASSESSMENT SHALL TAKE PLACE USING INSTRUMENTS SELECTED/DEVELOPED BY THE COURSE INSTRUCTOR.

ADDITIONAL INFORMATION:
Students are required to manipulate small sharp dissection instruments. Dissection is an integral component of this course. Exposure to chemical preservatives is minimal. Students may provide their own gloves (optional) which are available for purchase in the college bookstore. Students must observe all lab safety procedures.

Curriculum Approval Date: February 5, 2018
AASC APPROVAL DATE: February 21, 2018
REVIEW DATE: February 2023