COURSE TITLE & NUMBER: Integrated Anatomy and Physiology: BIOL 1201
CREDITS: 4 (4 Lec / 0 Lab)
PREREQUISITES: None

CATALOG DESCRIPTION:
Integrated Anatomy and Physiology is the study of organ systems and tissues of the human body. Systems included are the integumentary, skeletal, muscular, nervous, endocrine, cardiovascular, respiratory, lymphatic, digestive, urinary, and reproductive. Focus is on structures and the integrated control mechanisms of physiology in these systems. This course is intended for students in medical coding or related fields.

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. Blood
      1. Composition
      2. Formed elements including cells
      3. Plasma
      4. Hemostasis
   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

9. Cardiovascular system
A. Heart anatomy
B. Heart physiology
1. Electrical events
2. Heart sounds and contraction
3. Cardiac output
C. Blood vessels
1. Arteries, capillaries, and veins
2. Blood flow, pressure, and resistance
3. Circulatory pathways

10. Lymphatic system
A. Lymphatic vessels
B. Lymph nodes
C. Spleen, thymus, and tonsils
D. Immunity
1. Nonspecific cell and chemical defense
2. Phagocytes and inflammation
3. Antigen-antibody response
4. Cell-mediated immune response
5. Immunological memory
6. Imbalances of immunity

11. Respiratory system
A. Functional anatomy
B. Mechanics of breathing
C. Gas exchanges
D. Transport of gases by blood
E. Control of respiration

12. Digestive system
A. Functional anatomy
B. Digestive physiology
1. Chemical digestion
2. Absorption
3. Nutrition
4. Metabolism and the role of the liver
5. Energy balance

13. Urinary system
A. Kidney anatomy
B. Nephron physiology
1. Filtration
2. Reabsorption
3. Secretion

C. Urine
   1. Regulation
   2. Composition
   3. Voiding

D. Fluid and electrolyte balance
E. Acid-base balance

14. Reproductive system
   A. Anatomy of male reproductive system
   B. Physiology of male system
   C. Anatomy of female reproductive system
   D. Physiology of female system
      1. Hormonal regulation of ovarian cycles
      2. Hormonal regulation of uterine cycles
   E. Pregnancy and embryonic development

COURSE GOALS/OBJECTIVES/OUTCOMES:
1. Students will summarize cell and tissue function and describe the structure of each.
2. Students will describe body directional terms and locate body cavities.
3. Students will map skin structures and explain skin functions.
4. Students will diagram skeletal structures as they relate to skeletal functions.
5. Students will identify joint movements, muscle structures, and muscle functions.
6. Students will understand the roles of the nervous system and endocrine system in terms of body control, including the organs, functional units, chemical messengers, and accessory somatic senses.
7. Students will explain fluid circulation as it relates to cardiovascular and lymphatics systems.
8. Students will correlate the structure of respiratory organs to their function.
9. Students will explain digestive system functions, including the organs involved, breakdown of nutrients, and metabolic processes.
10. Students will outline urinary functions using urinary system organs, nephron structure, and fluid and electrolyte balance.
11. Students will identify the male and female reproductive organs and explain organ and hormone functions.

MNTC GOALS AND COMPETENCIES MET:
N/A

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 class 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.

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

ADDITIONAL INFORMATION: Exposure to chemical preservatives is minimal. Students must observe all class activity safety procedures.

Curriculum Approval Date: February 5, 2018

AASC APPROVAL DATE: February 21, 2018
REVIEW DATE: February 2023