Effective Implementation date: Summer 2018, 201910

Required Syllabus Information – all must be included in the course syllabus

BIO 202
Course Title: Human Anatomy and Physiology II with Lab:GT-SC1
Course Credits: 4
Course Description: Focuses on the integrated study of the human body and the histology, anatomy, and physiology of the following systems and topics: endocrine, cardiovascular, hematology, lymphatic and immune, urinary, fluid and electrolyte control, digestive, nutrition, respiratory, reproductive, and development. Includes a mandatory hands-on laboratory experience involving microscopy, observations, and dissection.

GT Pathways Requirements:

Guaranteed Transfer (GT) Pathways Course Statement:
Guaranteed Transfer (GT) Pathways Course Statement: The Colorado Commission on Higher Education has approved BIO 202 for inclusion in the Guaranteed Transfer (GT) Pathways program in the GT- SC1 category. For transferring students, successful completion with a minimum C– grade guarantees transfer and application of credit in this GT Pathways category. For more information on the GT Pathways program, go to CDHE GT Pathways Information.

NATURAL & PHYSICAL SCIENCES (N&PS) CONTENT CRITERIA – GT-SC1

1. The lecture content of a GT Pathways science course (GT-SC1)
    a. Develop foundational knowledge in specific field(s) of science.
    b. Develop an understanding of the nature and process of science.
    c. Demonstrate the ability to use scientific methodologies.
    d. Examine quantitative approaches to study natural phenomena.

2. The laboratory (either a combined lecture and laboratory, or a separate laboratory tied to a science lecture course) content of a GT Pathways science course (GT-SC1)
    a. Perform hands-on activities with demonstration and simulation components playing a secondary role.
    b. Engage in inquiry-based activities.
    c. Demonstrate the ability to use the scientific method.
    d. Obtain and interpret data, and communicate the results of inquiry.
    e. Demonstrate proper technique and safe practices.

COMPETENCIES & STUDENT LEARNING OUTCOMES FOR GT-SC1

Inquiry & Analysis:

4. **Select or Develop a Design Process**
    a. Select or develop elements of the methodology or theoretical framework to solve problems in a given discipline.
5. **Analyze and Interpret Evidence**

a. Examine evidence to identify patterns, differences, similarities, limitations, and/or implications related to the focus.
b. Utilize multiple representations to interpret the data.

6. **Draw Conclusions**
    a. State a conclusion based on findings.

Quantitative Literacy:

1. Interpret Information
    a. Explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words).
2. Represent Information
    a. Convert information into and between various mathematical forms (e.g., equations, graphs, diagrams, tables, words).

SYSTEM REQUIREMENTS:

REQUIRED COURSE LEARNING OUTCOMES

1. Develop a vocabulary of appropriate terminology to effectively communicate information related to anatomy and physiology.
2. Identify the anatomical structures and explain the physiological functions of body systems.
3. Explain the principle of homeostasis and the use of feedback loops to control physiological systems in the human body.
4. Use anatomical knowledge to describe physiological consequences, and use knowledge of function to describe the features of anatomical structures.
5. Explain the interrelationships within and between anatomical and physiological systems of the human body.
6. Synthesize ideas to make a connection between knowledge of anatomy and physiology in real-world situations, including healthy lifestyle decisions and homeostatic imbalances.
7. Demonstrate laboratory procedures used to examine anatomical structures.
8. Evaluate physiological functions of each organ system including dissection of human or dissection mammalian specimens.
9. Interpret graphs of anatomical and physiological data.

*Adapted from material copyrighted by the Human Anatomy and Physiology Society (HAPS)

RECOMMENDED COURSE LEARNING OUTCOMES

1. Demonstrate information literacy skills to access, evaluate, and use resources to stay current in the fields of anatomy and physiology.
2. Approach and examine issues related to anatomy and physiology from an evidence-based perspective.
3. Communicate clearly and in a way that reflects knowledge and understanding of the human body and demonstrates the ability to adapt information to different audiences and applications.

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REQUIRED TOPICAL OUTLINE

The required topical outline information MUST be included in the syllabi. It may be incorporated using one of the following variations: copying the topical outline as written below, integrating the topics within the assignment schedule, or listing the topics to be covered.

I. Endocrine System
   a. Overview of the Endocrine System
   b. Hypothalamus and Pituitary Gland Hormone Interactions
   c. Major Endocrine Glands and their Hormones
   d. Hormone Release and Regulation

II. Cardiovascular System
   a. Blood
      i. Functions of Blood
      ii. Component of Blood and their Functions
      iii. Hemopoiesis
      iv. Hemostasis
      v. Blood Types
   b. Heart
      i. Gross Anatomy of the Heart & Pericardium
      ii. Coronary Vessels
      iii. Cardiac Muscle
      iv. Cardiac Intrinsic Conduction System
      v. Cardiac Cycle
      vi. Cardiac Output
      vii. Cardiac Regulation and Control
      viii. EKG
   c. Blood Vessels & Circulation
      i. Blood Vessels Structure and Function
      ii. Physiology of Circulation
      iii. Capillary Exchange
      iv. Blood Pressure, Resistance and Blood Flow
      v. Blood Pressure Control and Regulation
      vi. Pulmonary Circulation
      vii. Systemic Circulation
         1. Head and Trunk
         2. Upper and lower Limbs
         3. Fetal Circulation

III. Lymphatic System
   a. Lymph & Lymph Vessels
   b. Lymph Cells, Tissues, and Organs
      i. Red Bone Marrow, Thymus
      ii. Lymph Nodes, Spleen, Tonsils, MALT

IV. Immune System and the Body's Defense
   a. Innate Defenses
      i. Surface Barriers
      ii. Innate Internal Defenses

- b. Adaptive Defenses
  - i. Antigens
  - ii. Lymphocytes and Antigen-Presenting Cells
  - iii. Humoral Immune Response
  - iv. Types of Immunoglobulins
  - v. Cellular Immune Response

V. Respiratory System
- a. Functional Anatomy of the Respiratory System
  - i. Upper & Lower Respiratory Tract
  - ii. Lungs
- b. Respiratory Physiology
  - i. Mechanisms of Pulmonary Ventilation
  - ii. Neural Control and Regulation of Ventilation
  - iii. Respiratory Blood Chemistry, Gas Exchange, and Gas Transport
  - iv. Respiratory Control and Regulation

VI. Digestive System
- a. Functional Anatomy of the Digestive System
  - i. Upper Gastrointestinal Tract
  - ii. Lower Gastrointestinal Tract
  - iii. Accessory Organs
- b. Physiology of Digestion and Absorption
  - i. Carbohydrates
  - ii. Proteins
  - iii. Lipids
  - iv. Nucleic Acids
  - v. Vitamins and Minerals
  - vi. Digestive Regulation and Control

VII. Nutrition and Metabolism
- a. Nutrients
- b. Metabolism
- c. Energy Balance
  - i. Cellular respiration
  - ii. Energy & Heat
- d. Regulating Blood Values of Nutrients
- e. Function of the Liver

VIII. Urinary System
- a. Gross and Microscopic Anatomy of the Urinary System
- b. Functional Anatomy of the Nephron
- c. Urinary Physiology: Urine Formation
  - i. Glomerular Filtration
  - ii. Tubular Reabsorption
  - iii. Tubular Secretion
- d. Urinary Regulation and Control
- e. Urine Characteristics, Transport, Storage and Micturition

IX. Fluid, Electrolyte and Acid-Base Balance
- a. Body Fluids
- b. Fluid Balance/Water Balance
- c. Electrolyte Balance

- d. Acid-Base Balance

X. Reproductive System
- a. Anatomy of the Male Reproductive System
  - i. Duct System and Accessory Structures and Glands
  - ii. Sperm and Semen
- b. Physiology of the Male Reproductive System
  - i. Male Reproduction Function
  - ii. Hormone Regulation and Control
  - iii. Male Sexual Response
  - iv. Gametogenesis/Spermatogenesis
- c. Anatomy of the Female Reproductive System
  - i. Oocyte Development
  - ii. Duct System and Accessory Structures and glands
- d. Physiology of the Female Reproductive System
  - i. Female Reproduction Function
  - ii. Ovarian Cycle
  - iii. Hormone Regulation and Control
  - iv. Female Sexual Response
  - v. Gametogenesis/Oogenesis

RECOMMENDED TOPICAL OUTLINE

I. Pregnancy and Human Development
- a. Pre-Embryonic Period to Fertilization
- b. Embryonic Period to Fetal Period
- c. Pregnancy
  - i. Effects on the Mother
  - ii. Parturition and Delivery
- d. Postnatal Changes

II. Heredity
- a. Human Genetics
- b. Patterns of Inheritance
- c. Sex-Linked Inheritance
- d. Penetrance and Environmental Influences on Heredity

Syllabi requirements, including legal compliance information must be included. Individual College syllabi guidelines may include additional information. Please contact your VPI/CAO for specific College requirements.