BIOL 108 Anatomy and Physiology 2
Credit Hours: 4
Scheduled hours per week
Lecture: 3
Lab: 2

Catalog Course Description: Continuation of Biology 107. This class includes study of the respiratory, circulatory (blood, heart, vessels) lymphatic, urinary, digestive, endocrine, and reproductive systems. Normal anatomy and physiology is emphasized, but some pathology is included. Lab work includes dissection of the body systems, plus selected physiology experiments in respiratory volumes, blood and blood genetics, urinalysis, and digestion rates. Critical thinking is developed using clinical examples. (3 lecture hours, 2 lab hours per week) (Pre-requisite: BIOL 107)

Pre-requisites: BIO 107, BIO 107L

Co-requisites: BIO 108L

Course Learning Outcomes (CLO):

- BIO 108
  1. Use anatomical terminology to identify and describe locations of major organs of each system covered.
  2. Explain interrelationships among molecular, cellular, tissue, and organ functions in each system.
  3. Describe the interdependency and interactions of the systems.
  4. Explain contributions of organs and systems to the maintenance of homeostasis.
  5. Identify causes and effects of homeostatic imbalances.
  6. Describe modern technology and tools used to study anatomy and physiology.

- BIO 108L
  1. Apply appropriate safety and ethical standards.
  2. Locate and identify anatomical structures.
  3. Appropriately utilize laboratory equipment, such as microscopes, dissection tools, general lab ware, physiology data acquisition systems, and virtual simulations.
  4. Work collaboratively to perform experiments.
  5. Demonstrate the steps involved in the scientific method.
  6. Communicate results of scientific investigations, analyze data and formulate conclusions.
  7. Use critical thinking and scientific problem-solving skills, including, but not limited to, inferring, integrating, synthesizing, and summarizing, to make decisions, recommendations and predictions.
     - **CLO Assessment Methods:** Direct Methods
       - Homework questions (Multiple format: essays, short answer, matching terminology, multiple choice, true and false statements)
       - Interactive classroom activities (think, pair share, anatomy and drawing exercises, buddy bonuses, etc.
       - Exam questions (Multiple format: essays, short answer, matching terminology, multiple choice, true and false statements)

- Lab activities (Dissections, Pre-lab and Post-lab reports, etc.)
- Final exam

- Indirect Methods
  - Course Evaluations

Topics to be studied:

- Module 1: Endocrine System
  1. General functions of the endocrine system
  2. Chemical classification of hormones and mechanism of hormone at receptors
  3. Control of hormone secretion
  4. Endocrine control by the hypothalamus and pituitary gland
  5. Endocrine structures and their hormones
  6. Local chemical messengers
  7. Hormonal response to stress
  8. Application of homeostatic mechanism
  9. Predictions related to disruption of homeostasis.
- Module 2: Cardiovascular System
  1. General functions of the cardiovascular system
  2. Composition of blood
  3. Hematopoiesis
  4. Hemostasis
  5. ABO and Rh blood grouping
  6. Gross and microscopic anatomy of the heart
  7. Physiology of cardiac muscle contraction
  8. Blood flow through the heart
  9. Electrical conduction system of the heart and the electrocardiogram
  10. Cardiac cycle
  11. Regulation of cardiac output, stroke volume and heart rate
  12. Anatomy and functional roles of the different types of blood vessels
  13. Systemic and pulmonary circuits
  14. Fetal versus postnatal circulation
  15. Blood pressure and its functional interrelationships with cardiac output, peripheral resistance, and hemodynamics
  16. Application of homeostatic mechanisms
  17. Predictions related to disruption of homeostasis
- Module 3: Lymphatic System
  1. General functions of the lymphatic system
  2. Lymph and lymphatic vessels
  3. Lymphatic cells, tissues, and organs
  4. Introduction to innate and adaptive immune responses
  5. Application of homeostatic mechanisms
  6. Predictions related to disruption of homeostasis
- Module 4: Respiratory System
  1. General functions of the respiratory system
  2. Gross and microscopic anatomy of the respiratory tract and related organs
  3. Mechanisms of pulmonary ventilation

4. Pulmonary air volumes and capacities
5. Mechanisms of gas exchange in the lungs and tissues
6. Mechanisms of gas transport in the blood
7. Control of pulmonary ventilation
8. Application of homeostatic mechanisms
9. Predictions related to disruption of homeostasis

- Module 5: Digestive System
  1. Structure and functions of the digestive system
  2. General gross and microscopic anatomy of the GI tract
  3. Peritoneum and mesenteries
  4. Oral cavity
  5. Anatomy of the pharynx
  6. Gross and microscopic anatomy of the esophagus
  7. Gross and microscopic anatomy of the stomach
  8. Gross and microscopic anatomy of the small intestine
  9. Gross and microscopic anatomy of the large intestine, rectum, and anal canal
  10. Gross and microscopic anatomy of the accessory digestive organs
  11. Motility in the GI tract
  12. Physiology of digestion
  13. Processes of absorption
  14. Hormonal and neural regulation of digestive processes
  15. Application of homeostatic mechanisms
  16. Predictions related to disruption of homeostasis
- Module 6: Urinary System
  1. General functions of the urinary system
  2. Gross and microscopic anatomy of the kidney
  3. Gross and microscopic anatomy of the urinary tract
  4. Functional process of urine formation, including filtration, reabsorption, and secretion
  5. Control of sodium, potassium, and water homeostasis
  6. Additional endocrine activities of the kidney
  7. Micturition
  8. Application of homeostatic mechanisms
  9. Predictions related to disruption of homeostasis
- Module 7: Reproductive System
  1. Overview of male and female reproductive systems
  2. Gross and microscopic anatomy of the male reproductive system
  3. Gross and microscopic anatomy of the female reproductive system
  4. Spermatogenesis and spermiogenesis
  5. Oogenesis, folliculogenesis, and the ovarian cycle
  6. Comparison of male and female gametogenesis
  7. Uterine cycle
  8. Lifespan changes within the male and female reproductive systems
  9. Fertilization and pregnancy
  10. Genetic variability, gene expression, and inheritance

Relationship of Course to Program Learning Outcomes (PLO) or Discipline Learning Outcomes:
Check if approved as: X Foundational Learning Course □ Reinforcement Learning Course

Special requirements of the course: N/A

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