

Course discipline/number/title: BIOL 1218: Anatomy and Physiology II

A. CATALOG DESCRIPTION

1. Credits: 4
2. Hours/Week: 3 lecture, 2 lab
3. Prerequisites (Course discipline/number): BIOL 1217
4. Other requirements: Prior completion or concurrent enrollment in CHEM 1117
5. MnTC Goals (if any): Goal 3/Natural Sciences

B. COURSE DESCRIPTION: This course is the second part of the two-semester Anatomy and Physiology sequence. This course covers the nervous, respiratory, digestive, urinary, endocrine, and reproductive systems. Metabolism and fluid, acid/base, and electrolyte balance are also discussed.

C. DATE LAST REVISED (Month, year): February, 2021

D. OUTLINE OF MAJOR CONTENT AREAS:

1. Nervous System
  - a) Organization
    - i. Central Nervous System (CNS)
    - ii. Peripheral Nervous System (PNS)
  - b) Histology
    - i. Neurons
    - ii. Neuroglia
    - iii. White matter and gray matter
  - c) Protection
    - i. Blood brain tumor
    - ii. Meninges
    - iii. Cerebrospinal fluid
  - d) Spinal cord
    - i. External and internal anatomy
    - ii. Sensory and motor tracts
    - iii. Spinal nerves
    - iv. Reflexes
  - e) Brain
    - i. Functional areas of the cortex
    - ii. Basal nuclei
    - iii. Diencephalon - thalamus and hypothalamus
    - iv. Limbic system
    - v. Brain stem – midbrain, pons, and medulla oblongata
    - vi. Reticular formation and reticular activating system
    - vii. Cerebellum
    - viii. Cranial Nerves
  - f) Autonomic nervous system (ANS)
    - i. Parasympathetic division
    - ii. Sympathetic division
  - g) General senses and sensory receptors
  - h) Special senses
    - i. Gustation and olfaction
    - ii. The eye and vision
    - iii. The ear, hearing and equilibrium
  - i. Homeostatic imbalances
2. Respiratory System
  - a) Anatomy and histology
  - b) Gas laws

- D. OUTLINE OF MAJOR CONTENT AREAS: Continued. . .
- c) Inspiration and expiration
  - d) External respiration
  - e) Internal respiration
  - f) Gas transport
  - g) Control of breathing
  - h) Homeostatic imbalances
3. Digestive System
- a) Anatomy and histology
  - b) Mechanical digestion
  - c) Chemical digestion and enzyme activity
  - d) Absorption of nutrients
  - e) Control of digestion
  - f) Homeostatic imbalances
4. Metabolism
- a) Anabolic and catabolic pathways for:
    - i. Carbohydrates
    - ii. Lipids
    - iii. Proteins
    - iv. Nucleic acids
  - b) Pre-absorptive and post-absorptive states
  - c) Cholesterol
  - d) Homeostatic imbalances
5. Urinary system
- a) Anatomy and histology
  - b) Functions
  - c) Urine formation – filtration, reabsorption, and secretion
  - d) Regulation of urine formation
  - e) Homeostatic imbalances
6. Fluid, electrolyte, and acid-base balance
- a) Intracellular vs. extracellular fluid
  - b) Electrolytes
  - c) Acid-base balance
    - i. Control of acid base balance of the body
    - ii. Physiological buffers - respiratory system and urinary system
    - iii. Buffer systems
  - d) Homeostatic imbalances
7. Endocrine system
- a) Anatomy and histology
  - b) General principles of hormone action
  - c) Hypothalamus
  - d) Pituitary gland
  - e) Thyroid gland
  - f) Parathyroid glands
  - g) Pancreas
  - h) Adrenals glands
  - i) Gonads – testes and ovaries
  - j) Other endocrine tissues
  - k) Homeostatic imbalances
8. The reproductive System

- D. OUTLINE OF MAJOR CONTENT AREAS: Continued. . .
- a) Male reproductive anatomy and histology
  - b) Female reproductive anatomy and histology
  - c) Regulation of male and female reproductive cycles
- E. LEARNING OUTCOMES (GENERAL): The student will be able to:
1. Demonstrate the ability to use vocabulary/terminology appropriately both orally and in writing.
  2. Demonstrate an understanding of proper microscope use and care.
  3. Identify major anatomical structures of the nervous, respiratory, digestive, urinary, endocrine and reproductive systems.
  4. Identify the histology of major organs in the body systems listed above.
  5. Relate the structure of major organs/glands in the systems listed above to their functions.
  6. Explain physiological principles specific to each body system listed above.
  7. Predict how homeostatic imbalance(s) can lead to disease.
- F. LEARNING OUTCOMES (MNTC):
- Goal 3/Natural Sciences: The student will be able to:
1. Demonstrate understanding of scientific theories.
  2. Formulate and test hypotheses by performing laboratory, simulation, or field experiments in at least two of the natural science disciplines. One of these experimental components should develop, in greater depth, the student's laboratory experience in the collection of data, it's statistical and graphical analysis, and an appreciation of its sources of error and uncertainty.
  3. Communicate their experimental findings, analyses, and interpretations both orally and in writing.
- G. METHODS FOR EVALUATION OF STUDENT LEARNING: Methods may include but are not limited to:
1. Lecture Exams
  2. Lecture and/or laboratory quizzes
  3. Lecture and/or laboratory assignments or reports
  4. Laboratory practical exams
- H. RCTC CORE OUTCOME(S): This course contributes to meeting the following RCTC Core Outcome(s):
- Critical Thinking. Critical Thinking. Students will think systematically and explore information thoroughly before accepting or formulating a position or conclusion.
- I. SPECIAL INFORMATION (if any):
- The initial lab session explains and familiarizes the student with general safety hazards and safety equipment in the lab. During the pre-lab discussion, the hazardous characteristics of any materials used during the lab are discussed. In addition, if the lab involves any potentially infectious material, the students will be instructed about the proper use and disposal. The instructor will direct all students to wear necessary protective equipment while working with any hazardous chemicals. Safety Data Sheets for chemicals used are available online.