

Course discipline/number/title: BIOL 1216: Anatomy and Physiology of the Nervous and Respiratory Systems

A. CATALOG DESCRIPTION

1. **Credits:** 1
2. **Hours/Week:** 31.5 hours total lecture and 21 hours total lab
3. **Prerequisites (Course discipline/number):** BIOL 1110, CHEM 1101
4. **Other requirements:** None
5. **MnTC Goals (if any):** Goal 3/Natural Sciences

B. COURSE DESCRIPTION: This course will cover in detail the anatomy and physiology of the nervous and respiratory systems.

C. DATE LAST REVISED (Month, year): May, 2020

D. OUTLINE OF MAJOR CONTENT AREAS:

1. Nervous System
 - a) Organization of the nervous system
 - i. CNS
 - ii. PNS
 - b) Nervous tissue
 - i. Neurons
 - ii. Neuroglia
 - iii. White matter and gray matter
 - c) Protection
 - i. Blood brain barrier
 - 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
 - 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

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 proper use and care of the microscope.
3. Identify major anatomical structures of the nervous and respiratory 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, 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. Laboratory reports and/or quizzes
2. Objective and/or subjective lecture tests
3. Laboratory practical tests
4. Assignments
5. Essay tasks
6. Group work/projects
7. Attendance (especially laboratory attendance)

H. RCTC CORE OUTCOME(S). This course contributes to meeting the following RCTC Core Outcome(s).

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.