NORTHWESTERN CONNECTICUT COMMUNITY COLLEGE

COURSE SYLLABUS

Course Title: Anatomy & Physiology II **Course #:** BIO* 212

Course Description: Four (4) semester hours (3 class hours; 3 laboratory hours).
A study of the structure and function of the human body. Includes a detailed analysis of the nervous, endocrine, digestive, respiratory, circulatory, lymphatic, urinary and reproductive systems. Emphasis is placed on the interrelationships of the systems.

Pre-requisite/Co-requisite: Prerequisite: BIO* 211.

Goals:

1. To investigate and integrate the functions and microscopic and gross structure of the systems listed in the description.
2. To apply knowledge of cytology and histology to organ and system structure and function.
3. To apply appropriate technical and medical terminology to basic body structures and functions.
4. To acquaint the student with the more common abnormal and pathological conditions of each system considered.
5. To provide the student with a comprehensive understanding of the structure and function of mammalian systems.
6. To apply knowledge of physiological principles to organs and organ systems and to investigate the inter-relationships between the body systems.
7. To study and integrate the structure and function of the nervous, endocrine, lymphatic, cardiovascular, digestive, respiratory, urinary and reproductive systems.
8. To consider discords and clinical syndromes associated with specific systems as they pertain to both human and veterinary medicine.

Outcomes: At the end of this course students should be able to:

- Contrast the histological characteristic and functions of tissues from the nervous, endocrine, lymphatic, cardiovascular, digestive, respiratory, urinary and reproductive systems.
- Discuss the events of electrical signal transmission to and from the brain using specific sensory and motor pathways
- Recognize the role of specific neurotransmitters
- Discus reflex arcs and pathways
- Identify regions and structures of the brain and spinal cord and their functions
- Compare structural and functional differences of the somatic and autonomic portions of the nervous system

- Trace sensory input from a peripheral receptor to the appropriate spinal tracts to specific tracts and regions in the brain for interpretation and integration.
- Trace motor impulses from the brain to specific skeletal muscle effectors
- Describe the anatomical structure and function of the sympathetic and parasympathetic divisions of the nervous system
- Identify neurotransmitters and receptors in the autonomic responses
- Describe how hormones interact with target-cell receptors
- Describe the location history, hormones and functions of the endocrine glands
- Identify, demonstrate, explain and apply regulation and feed back mechanisms for hypothalamic, pituitary, adrenal, thyroid, pancreatic, reproductive, parathyroid, and other endocrine cells
- Understand common endocrine pathologies
- Explain the stress and general adaptation syndrome model
- List and describe the components and functions of blood
- Recognize then principal physical characteristics of blood
- Identify the mechanisms that contribute to hemostasis
- Identify and recognize the stages in blood clotting and explain the various factors that promote and inhibit blood clotting
- Identify and explain blood grouping
- Identify common blood pathologies
- Describe the anatomy macroscopically and microscopically of the heart
- Describe the flow of blood through the chambers of the heart and through the systemic and pulmonary circulations
- Identify the major blood vessels involved in coronary circulation
- Recognize and identify fetal blood circulation through the heart
- Explain the structural and functional features of the conduction system of the heart
- Recognize the components of an ECG and its diagnostic importance
- Recognize the phases, timing and heart sounds associated with a cardiac cycle
- Define cardiac output and recognize the factors that affect it
- Contrast the structure and function of arteries, arterioles and capillaries, venules and veins
- Identify the various pressures involved in the movement of fluids between capillaries and interstitial spaces
- Identify factors that regulate the velocity and volume of blood flow
- Recognize factors that determine mean arterial blood pressure
- Describe factors that determine systemic vascular resistance
- Identify factors that impact blood pressure and its regulation
- Define shock, pulse, systolic, diastolic and pulse pressure
- Identify the four principal division of the aorta and the major arterial branches arising from each division
- Discuss venous return
- Discuss common cardiovascular problems

- Recognize the general components of the lymphatic system and its functions
- Identify the organization of lymphatic vessels
- Explain the formation and flow of lymph
- Identify the mechanisms of nonspecific resistance to disease and specific resistance
- Discuss the elements of cell-mediated immunity
- Identify the components of antibody-mediated immunity
- Identify the factors involved with self-recognition
- Identify the anatomy, histology and functions of the upper and lower respiratory tracts
- Describe the events that cause inspiration and expiration
- Define lung volumes
- Recognize Dalton's Law, Henry's Law, Boyle's Law
- Describe the exchange of oxygen and carbon dioxide in external and internal respiration
- Explain oxygen and carbon dioxide transport in the blood
- Understand the factors that influence and regulate the depth and rate of respiration
- Identify the organs of the digestive system macroscopically and histologically and their functions (of humans and other omnivores)
- Describe the location, function and histology of accessory organs of digestion including, the liver, gall bladder, and pancreas
- Discuss the role of digestive hormones and their regulation
- Identify and explain the role of nervous system, hormonal and other factors on regulation of the digestive process
- Identify and apply the mechanisms of absorption, transport and metabolism of proteins, lipids and carbohydrates in digestion and plasma transport
- Define basal metabolic rate
- Identify the functions of the kidneys
- Describe and identify gross and microscopic anatomy of the kidneys, ureters, urinary bladder and urethra
- Trace the blood circulation through the kidneys
- Identify and apply principles that promote and oppose glomerular filtration
- Describe routes and mechanisms of tubular and reabsorption and secretion
- Relate the mechanisms of water reabsorption to regulation of blood volume and pressure
- Define renal plasma clearance and describe its importance
- Define urinalysis and identify specific components

In the laboratory portion of the course, students will address the Reproductive system. At the end of this course students in the Human Allied Health lab section will be able to:

- Describe the process of meiosis
- Describe the structure, function and histology of the male and female reproductive systems
- Compare the major events of the ovarian and uterine cycles
- Discuss common reproductive pathologies
- Identify the processes associated with fertilization, implantation, early embryonic and fetal development
- Describe the embryonic membranes and their functions
- Identify the role and development of the placenta
- Identify the three stages of labor
- Discuss common disorders of pregnancy

College Policies

Plagiarism: Plagiarism and Academic Dishonesty are not tolerated at Northwestern Connecticut Community College. Violators of this policy will be subject to sanction. Please refer to your "Student Handbook" under "Policy on Student Rights," the Section entitled "Student Discipline," or the College catalog for additional information.

Americans with Disabilities Act (ADA): The College will make reasonable accommodations for persons with documented learning, physical, or psychiatric disabilities. Students should notify Roseann Dennerlein, the Counselor for Students with Disabilities. She is located at Green Woods Hall, in the Center for Student Development. Her phone number is 860-738-6307 (V/TTY) and her email is rdennerlein@nwcc.commnet.edu.

School Cancellations: If snowy or icy driving conditions cause the postponement or cancellation of classes, announcements will be made on local radio stations. Students may also call the College directly at (860) 738-6464 to hear a recorded message concerning any inclement weather closings. Students are urged to exercise their own judgment if road conditions in their localities are hazardous.