Biology 2402
Course Syllabus: Fall 2015

“Northeast Texas Community College exists to provide responsible, exemplary learning opportunities.”

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Office Hours

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The information contained in this syllabus is subject to change without notice. Students are expected to be aware of any additional course policies presented by the instructor during the course.

Catalog Course Description (include prerequisites): Anatomy & Physiology II is intended for students entering field of study in allied health sciences, social work, physical therapy, physical education or any student who needs a basic understanding of the structure and function of the human body. This course is the second semester of a two semester sequence and includes a study of the nervous, cardiovascular, immune, digestive, excretory, respiratory, endocrine, and reproductive systems. Three hours of lecture and three hours of lab each week. Prerequisite:

Required Textbook(s): Hole’s Human Anatomy & Physiology 14th ed. Shier/Butler/Lewis

Publisher: McGraw-Hill Publishers
ISBN Number: 978-0-07-802429-0

Recommended Reading(s):
- Assigned Text Book

Student Learning Outcomes:

Outcomes Upon successful completion of this course, students will:
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.

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 decision

Exemplary Educational Objectives:

The objective of the study of a natural sciences component of a core curriculum is to enable the student to understand, construct, and evaluate relationships in the natural sciences, and to enable the student to understand the basis for building and testing theories.

The exemplary educational core objectives for natural sciences are:

3.1 to understand and apply method and appropriate technology to the study of natural sciences;
3.2 to recognize scientific and quantitative methods and the differences between theses approaches and other methods of inquiry and to communicate findings, analyses, and interpretation both orally and in writing;
3.3 to identify and recognize the differences among competing scientific theories;
3.4 to demonstrate knowledge of the major issues and problems facing modern science, including issues that touch upon ethics, values, and public policies;
3.5 to demonstrate knowledge of the interdependence of science and technology and their influence on, and contribution to, modern culture.

SLO
1. Differentiate between general and special senses.
2. Distinguish between endocrine and exocrine gland and general characteristics of the endocrine system. Name the major endocrine glands and their hormones.
3. Describe the characteristics of blood and discuss its major functions.
4. Discuss the functions of the organs of the cardiovascular system.
5. Describe the major structures and general functions of the lymphatic system.
6. Name the major organs of the digestive system and describe the general functions.
7. Name the major organs of the respiratory system and describe the general functions.
8. Name the major organs of the urinary system and describe the general functions. Explain the importance of water, electrolyte and acid/base balance.
9. Name the major organs of the male and female reproductive systems and describe the general functions of each organ.
10. Demonstrate knowledge of pregnancy and distinguish between growth and dev
SCANS Skills:
N/A

Lectures & Discussions:
CHAPTER 12 - SOMATIC AND SPECIAL SENSES

Chapter Concepts: In studying Chapter 12, the student should gain mastery of the following concepts:

1. Senses can be classified as general or special according to the complexity of the receptors and neural pathways. They can also be classified as somatic and visceral according to the location of the receptors.

2. Sensory stimuli converted into nerve impulses by specialized receptor cells are conducted to the brain for perception.

3. Visual sense is responsible for approximately 80% of all assimilated knowledge. The eye has many structural features that protect it from damage.

4. The ear is the organ of hearing and equilibrium. It contains receptors for the detection of head movements and receptors that convert waves into nerve impulses.

5. The sensory organs develop rapidly from the primary germ layers in the embryonic and fetal stages of development.

CHAPTER 13 - ENDOCRINE SYSTEM

Chapter Concepts: In studying Chapter 13, the student should gain mastery of the following concepts:

1. Glands can be classified structurally and functionally as endocrine or exocrine. Endocrine glands are ductless glands that secrete specific hormones directly into the blood. Exocrine secrete into ducts.

2. Hormones are transported by the blood to specific sites (target cells), where they perform precise functions.

3. Both the endocrine and nervous system regulates body activities. The actions of hormones and neurotransmitters are very similar, although neurotransmitters do not travel in the blood but instead diffuse only a very short distance across a synapse. The effects of hormones are relatively slow to occur but are generally prolonged, whereas neurological responses are measured in milliseconds.

4. There are three types of hormones: amines, proteins, and steroids.

5. Elaborate feedback mechanics ensure homeostasis within the organ systems served by the endocrine system.

6. Alterations in the delicate hormonal balance may result in serious clinical manifestations.

CHAPTER 14 - BLOOD
Chapter Concepts: In studying Chapter 14, the student should gain mastery of the following concepts:

1. The trillions of cells within the body all need a continuous link to the blood within the circulatory system if they are to survive.

2. The circulatory system has a close functional relationship with the respiratory, urinary, digestive, endocrine, and integumentary system in maintaining homeostasis.

3. Blood transports oxygen and nutritive molecules to the tissue cells and carbon dioxide and other waste away from the cells; it also carries hormones and other regulatory molecules to the target organs.

4. Leukocytes and their products serve to protect the body from infection.

5. Trauma to a blood vessel initiates a sequence of events that leads to the formation of a blood clot. Platelets play an important role in blood clotting.

CHAPTER 15 - CARDIOVASCULAR SYSTEM

Chapter Concepts: In studying Chapter 15, the student should gain mastery of the following concepts:

1. The microscopic capillaries are the basic functional units of the circulatory system because it is at the level that exchange between the blood and fluids surrounding cells occur.

2. Cardiac muscle is specialized for involuntary rhythmic contractions that can be regulated by the autonomic nervous system.

3. Arteries are vessels that transport blood away from the heart. Veins are vessels that return blood to the heart. Capillaries directly serve cellular needs by permitting exchange between the blood and tissue cells.

4. The hepatic portal system function to filter all of the blood from digestive organs through the liver.

5. The circulatory system of a fetus has specialized structural adaptations to obtain oxygen and nutrients from the placenta.

6. Because heart attacks are the leading cause of death in the United States, students should be advised of the importance of maintaining a healthy circulatory system.

7. Blood pressure is the force exerted by the blood against the walls surrounding the lumina of the blood vessels. The main factors that influence blood pressure are cardiac output, peripheral resistance, and blood volume. The kidneys regulate blood pressure by controlling blood volume.

8. During exercise, aerobic requirements of the heart increases, as does blood pressure.

9. The baroreceptors reflex and other reflexes help to maintain blood pressure within normal limits.
10. Hypertension is the condition of elevated blood pressure.

CHAPTER 16 - LYMPHATIC SYSTEM AND IMMUNITY

Chapter Concepts: In studying Chapter 16, the student should gain mastery of the following concepts:

1. Lymph capillaries drain tissue fluids, which is called lymph.
2. Lymph filters through lymph nodes that contain phagocytic cells and through lymphatic nodules that produce lymphocytes.
3. The spleen, tonsils, and thymus are lymphoid organs.
4. The lymphatic system functions to protect the body from disease, return tissue fluid to the venous system and transport absorbed fat to the blood.
5. Immune system defenses can be specific or nonspecific. Specific immunity is a function of lymphocytes.
6. Specific immunity may be naturally or artificially acquired and may be active or passive immunity.

CHAPTER 17 - DIGESTIVE SYSTEM

Chapter Concepts: In studying Chapter 17, the student should gain mastery of the following concepts:

1. The digestive system is divided into a gastrointestinal (GI) tract and accessory organs.
2. The organs of the digestive system are specialized for digestion and absorption of food.
3. Both the histological and gross structural aspects of each region of the GI tract determine its physiological function.
4. Absorption is the key aspect of the digestive system. Although food is ingested, it is not technically within the body until absorption occurs. In fact, a large portion of consumed food remain undigested and passes through the large intestines as waste material.
5. The villi within the small intestine are the functional units for absorption of nutrients.
6. The liver performs numerous vital functions, including the processing of nutrients and the secretion of bile, which is stored and concentrated in the gallbladder. The pancreas has both important exocrine and endocrine functions.
CHAPTER 19 - RESPIRATORY SYSTEM

Chapter Concepts: In studying Chapter 19, the student should gain mastery of the following concepts:

1. Respiration refers not only to breathing, or ventilation, but also to the exchange of gases between the atmosphere, the blood, and individual cells.

2. The obvious function of the respiratory system is to provide oxygen to the bloodstream and remove carbon dioxide, but it also enables vocalization.

3. The metabolic needs for oxygen are great, and few reserves of oxygen exist within the body.

4. Inspired air must be warmed, cleaned, and moistened before it is suitable for diffusion at the alveoli. Structural adaptation of the conducting portion of the respiratory system perform these functions.

5. Neurons in the medulla oblongata establish the basic rhythm of breathing, but their activities can be influenced by input from other parts of the brain and from peripherally located receptors sensitive to the PCO2, pH, and PO2 of the arterial blood.

6. The respiratory system is constantly exposed to airborne particles and even pathogens. Extensive protective mechanisms within the respiratory system keep the alveoli healthy.

CHAPTER 20 - URINARY SYSTEM

Chapter Concepts: In studying Chapter 20, the student should gain mastery of the following concepts:

1. Metabolic waste are eliminated by several body systems, it is misleading to refer to the urinary system as the excretory system.

2. The histological structure of the organs of the urinary system determine their functions.

3. The nephron is the functional unit of the kidney.

CHAPTER 21 - WATER, ELECTROLYTE, AND ACID-BASE BALANCE

Chapter Concepts: In studying Chapter 21, the student should gain mastery of the following concepts:

1. Several types of fluid and molecular movements, including diffusion, osmosis, filtration, active transport, and pinocytosis, occur in the kidneys in the formation of urine.

2. Through the countercurrent multiplier system, the urine becomes more concentrated as it passes through the nephron.

3. Constant filtration of blood is essential for body sustenance, and interruption of the process by disease or physical impairment is generally life threatening.
CHAPTER 22 - REPRODUCTIVE SYSTEM

Chapter Concepts: In studying Chapter 22, the student should gain mastery of the following concepts:

1. It is through sexual reproduction that many species are propagated. The offspring then have genetic traits inherited from both parents.

2. Unlike the other body systems that sustain the organisms and maintain homeostasis, the reproductive system is specialized to perpetuate the species and pass genetic material from generation to generation.

3. Gametes are formed through a specialized form of cell division called meiosis.

4. The reproduction organs and their hormonal effects accounts for the major differences between males and females.

5. There are remarkable developmental similarities called homologics between the male and female reproductive system.

6. The reproductive system is unique because its latent development is under hormonal control.

7. Unlike the production of male sperm, which first occurs at puberty, female gametes are produced prenatally.

8. Cyclic ovulation occurs throughout the reproductive period of the female, which extends from puberty to menopause.

9. Hormonal concentrations determine the cyclic pattern of ovulation and menstruation.

10. Hormonal interaction also causes changes in the mammary gland during pregnancy and regulate lactation.

11. Although both males and females are susceptible to sexually transmitted disease, females are more prone to reproductive dysfunctions and diseases because of cyclic changes in reproductive events, problems associated with pregnancy, and the susceptibility of the breast to infections and n

Evaluation/Grading Policy:
I. Lecture

Lecture will meet twice a week; meeting for one hour and twenty minutes per lecture.

A. Four major tests will be given 50% of grade
B. One Comprehensive Final 25%

II. Lab
Lab will meet once or twice a week depending on your schedule. Twice a week labs will meet for one hour and twenty minutes per day. Once a week labs will meet two hours and forty minutes. However, lab time, on certain days, will depend on the time needed to complete necessary lab assignments or procedures.

A. Daily Work 20%
B. Lab Practicals 80%

III. Final Evaluation

Lecture 50%
Lab 25%
Comprehensive Final 25%

Tests/Exams:

Assignments:

LECTURE CALENDAR BIOLOGY 2402 Fall 2015

WEEK/ LECTURE/ TOPIC(S)  
Aug 24 Roll call/Syllabus  
Aug 26 Chapter 12 Somatic and Special senses 
Aug 31 Chapter 12 Somatic and special senses  
Sept. 2 Chapter 12 Somatic and special senses  
Sept. 7 Holiday  
Sept. 9 Chapter 12 Somatic and special senses  
Sept. 14 Chapter 12 Somatic and special senses  
Sept. 16 Chapter 12 Somatic and special senses  
Sept. 21 Lecture Test #1 Chapter 12  
Sept 23 Endocrine/Reproduction  
Sept. 28 Chapter 13/22 Endocrine/Reproduction  
Sept 30 Chapter 13/22 Endocrine/Reproduction  
Oct. 5 Chapter 13/22 Endocrine/Reproduction  
Oct 7 Chapter 13/22 Endocrine/Reproduction  
Oct 12 Lecture Test #2 Chapter 13/22 Endocrine/Reproduction  
Oct.14 Chapter 14 Blood  
Oct 19 Chapter 14 Blood  
Oct 21 Chapter 14 Blood  
Oct 26 Chapter 14 Heart Cardiovascular  
Oct 28 Chapter 15 Heart Cardiovascular
Other Course Requirements:

Student Responsibilities/Expectations:

Attendance Policy

Regular and punctual attendance at all scheduled classes is required by every student. Students absent, for any reason, are still responsible for lecture materials and any required assignments. There are no excused absences. Excessive absences will ultimately hinder your success in this course. Therefore, it is the responsibility of the student to withdraw from this course before the final withdrawal date to receive a “W”. However, your failure to abide by this institutional rule will result in you receiving an “F” for this course.

NTCC Academic Honesty Statement:

"Students are expected to complete course work in an honest manner, using their intellects and resources designated as allowable by the course instructor. Students are responsible for addressing questions about allowable resources with the course instructor. NTCC upholds the highest standards of academic integrity. This course will follow the NTCC Academic Honesty policy stated in the Student Handbook."

Academic Ethics

The college expects all students to engage in academic pursuits in a manner that is beyond reproach. Students are expected to maintain complete honesty and integrity in their academic pursuit. Academic dishonesty such as cheating, plagiarism, and collusion is unacceptable and may result in disciplinary action. Refer to the student handbook for more information on this subject.
ADA Statement:
It is the policy of NTCC to provide reasonable accommodations for qualified individuals who are students with disabilities. This College will adhere to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations as required to afford equal educational opportunity. It is the student’s responsibility to request accommodations. An appointment can be made with John Coleman, Academic Advisor/Coordinator of Special Populations located in the College Connection. He can be reached at 903-434-8104. For more information and to obtain a copy of the Request for Accommodations, please refer to the NTCC website - Special Populations.

Family Educational Rights And Privacy Act (FERPA):
The Family Educational Rights and Privacy Act (FERPA) is a federal law that protects the privacy of student education records. The law applies to all schools that receive funds under an applicable program of the U.S. Department of Education. FERPA gives parents certain rights with respect to their children’s educational records. These rights transfer to the student when he or she attends a school beyond the high school level. Students to whom the rights have transferred are considered “eligible students.” In essence, a parent has no legal right to obtain information concerning the child’s college records without the written consent of the student. In compliance with FERPA, information classified as “directory information” may be released to the general public without the written consent of the student unless the student makes a request in writing. Directory information is defined as: the student’s name, permanent address and/or local address, telephone listing, dates of attendance, most recent previous education institution attended, other information including major, field of study, degrees, awards received, and participation in officially recognized activities/sports.

Other Course Policies:
All cell phones will be turned off during lecture and test. Students must obtain permission from instructor to place phone on vibrate in case of emergency.