University of Houston-Downtown

Course Prefix, Number, and Title: BIOL 1303: Human Anatomy and Physiology I

Credits/Lecture/Lab Hours: 3/3/0

Foundational Component Area: Life and Physical Sciences

Prerequisites: Credit or enrollment in BIOL 1103
Co-requisites: None

Course Description: A survey of Human Anatomy and Physiology required for students going to nursing or similar professional programs. Emphasis will be placed on cells and tissues of the human body and its skeletal, muscular, integumentary, nervous and sensory systems.

TCCNS Number: BIOL 2301

Demonstration of Core Objectives within the Course:

Assigned Core Objective	Learning Outcome Students will be able to:	Instructional strategy or content used to achieve the outcome	Method by which students' mastery of this outcome will be evaluated
Critical Thinking Empirical & Quantitative Reasoning	Utilize scientific processes to identify questions pertaining to natural phenomena.	1. Homeostasis Online: Students will analyze and interpret case studies on various physiological conditions of the body pertaining to homeostasis in online course content. They will determine the receptors involved, role of control center and the response of the effectors in either negative or positive feedback homeostatic regulation of the cases. Students will work on critical thinking questions on homeostasis, levels of human organization and the fundamental principle of Anatomy & Physiology "Form fits Function 2. Membrane Transport Mechanism Students will find evidence of membrane transport processes in physiological functioning of body systems from the textbook or	Homeostasis: Online Students will post their analysis of case studies on homeostasis on the Discussion Board forum. Students must give two examples of homeostasis that they have experienced providing complete explanation of the process of homeostasis. They will also read/comment on other student's postings. Students are graded on a rubric based on originality, accuracy and clarity of explanation of the principle of homeostatic mechanism. In Class: Students will work in groups analyzing case studies and interpreting the factors leading to homeostatic regulation and will prepare an oral presentation of their analysis with illustrations. Grading is based on a rubric.

		outside sources and explain the mechanism in their own words. From their evidence of transport processes they will analyze the structure of tissue involved and relate that to function of the system. Such as Respiratory membrane in the alveoli allows simple diffusion, capillary endothelium allows filtration and osmosis etc. Students will also find evidence of application of membrane transport mechanism in the kitchen such as using coffee filter, tea bags etc. Students will work on critical thinking questions pertaining to membrane transport mechanisms and maintain homeostasis. <u>3. Anatomical Language</u> Students will use anatomical models to determine anatomical parts of the body; cavities, organs, directional terms and determine the inter-relationship between the organ systems <u>4. Tissues</u> Students will determine microscopic structure of tissues to determine the levels of organization and determine --- <u>5. The Integumentary System</u>. Students will research on artificial tanning, use of chemicals in beauty products and read from internet resources provided about the potential myth of some popular products and the harm that may be attributed to use of such products. <u>6. Skeletal System and Joints</u>	Both online and in class Students will submit answers to Critical Thinking questions as an assignment which is graded on clarity of explanation and accuracy of content. Case studies will allow students to qualitatively and quantitatively analyze data --- <u>2. Membrane Transport Mechanism</u> Online and In class: Students will use the discussion board forum to post/comment on messages and write a paper listing the evidences, with explanation on the application of the membrane transport processes. Students are evaluated on a rubric based on accuracy and clarity of explanation of the membrane transport processes selected <u>Assignments on Critical Thinking</u> Students are graded on clarity of explanation and accuracy of content <u>3. Anatomical Language</u> Students work in groups to examine anatomical language. Students will work on Lab worksheet which includes some problem solving questions at the end of the lab period. <u>4. Tissues</u> Students will work individually to determine tissue structure. They work on worksheets and use illustrations to understand tissue structure. _____ 5. The Integumentary System Online Students will post the information from their research that surprised them the most on Discussion Board Forum with an explanation.

		Students will study the cause of osteoporosis and gather information on Bone Density and its relevance to osteoporosis. They will also study mechanism of action of some of the drugs commonly prescribed to slow down or reverse the process Students will study anatomical structure of joints and the methods used for surgery such knee replacement to understand the mechanism of operation of the joints of the body. 7. Musculoskeletal System Students will use models and figures to determine the location of bones, joints and muscles of the body. They will use the anatomical information to establish relationship between these three structures and evaluate their mechanism of action. 8. Nervous System Students build concept on function of nervous system from gathering information on Neurotransmitters. They research on the use and abuse of neurotransmitters, neurotoxicity and substances that produce EPSP and IPSP and relate to the function of ion channels in regulating neural homeostasis. Students study the anatomical structure of brain and relate to the functional properties of the structures and analyze disorders related to these brain structures. Students will use anatomical models and preserved sheep brain to determine the anatomical parts of the brain and infer a inter-relationship between the	They will also read and comment on other posted messages. Evaluation is based on a rubric. In Class students will discuss in class their research and submit their paper for grade 6. Skeletal System and Joints Online Students will use Discussion Board forum to post messages pertaining to their own experience relevant to the Skeletal system and joints. Their posting will include explanation on fracture repair or casting or arthritis or any other disease from what they learned in class. In class students share their stories and explanation in groups. Assignments on Critical Thinking Students are graded on clarity of explanation and accuracy of content. --- 5. Musculoskeletal System and 6. Nervous System Students examine anatomical parts. They work on Lab worksheet which is graded on their ability to locate structures and describe relationship between structure and function

		anatomical parts and physiological function.	
Critical Thinking Empirical & Quantitative Reasoning	Utilize scientific processes to develop hypotheses, collect and analyze data using quantitative and qualitative measures.	Homeostasis Body Temperature measurement: Homeostatic regulation Pulse Reading: Homeostatic regulation Chemistry Students will form hypotheses on testing properties of water, pH and enzyme action on common food substances. Membrane Transport Processes Students will form hypotheses and design experiments to test membrane transport processes such as simple diffusion and osmosis.	Homeostasis: Students will measure their body temperature over a period of 7 days in the morning and at night, record their temperature, plot it as a graph and explain their observation. Students will record their pulse count 4 times during the day for 7 days. Record the time and activity they were in when they took their pulse count and plot it as a graph. Grading will be based on a rubric on organization, data representation and clarity of explanation Chemistry and Membrane Transport Processes Students will perform experiments to test their hypotheses and write a Lab Report which is graded on a rubric
Critical Thinking Empirical & Quantitative Reasoning Communication	Utilize scientific processes to effectively communicate the analysis and results using written, oral and visual communication.	The Integumentary System Students will research on different types of cancers: Cause , prevalence and preventive measure that can minimize incidence of occurrence. Articulations and Skeletal System Students will research selected joint disorders, analyze anatomical changes associated with the disorder and discuss methods of treatment and prevention. Nervous System Students research on action of Neurotransmitters and their effect on physiologic processes of the body and homeostatic regulation. Students analyze neurotransmitter action and their use as drugs, potentially harmful toxins and cause for various neurological disorders and their possible cure	Students will prepare a research paper on Skin Cancer Assessment is based on a rubric on organization, scientific basis and relevance of facts, quality of writing and explanation of preventive measures. Online Students will peer review paper submitted by other students and grade them on a rubric provided. Articulations and Skeletal System Online Students will prepare a presentation as Power Point with oral communication. They will upload a Power Point with voice over for assessment and peer review. The assessment is based on a rubric, for the quality of the presentation and content In Class Students will prepare an oral presentation on Joint Disorders for the class. Students participate in discussion on the presentation.

		Musculoskeletal System Students will work in groups to build models of Gross and Anatomical Muscle Structure Articulations Students will work in groups to determine the anatomical structures in the Joints of the Skeletal System	Assessment is based on a rubric emphasizing on content, explanation and clarity Neurotransmitters Online and In class students write a paper identifying functions of neurotransmitters and analyzing their potential effects on the body. They research the cause of various neurological diseases which relate to the action or amount of neurotransmitters produced. Musculoskeletal System and Articulations Students will make a class presentation of the models. Grading is on a rubric and the models are Peer Reviewed.
Teamwork	Collaborate in the evaluation of the quality of scientific evidence from multiple perspectives toward the goal of reaching a shared objective.	Musculoskeletal System: Students will research on the use of Muscle building supplements and their effect from multiple resources.	Online and In class students will write a paper on the research which will include the chemical composition of the muscle supplements, data on effectiveness and conclusion. They will get to see and comment on papers submitted by others and participate in a Discussion Board forum.

Additional Course Outcomes:

Lecture: Students will:

- Identify the important anatomical structures in each of the state organ systems.
- Demonstrate an understanding of all important physiological processes of the stated systems.
- Describe the interrelationships between anatomy and physiology in each of the organ systems listed.
- Explain the principle of homeostasis and the primary control mechanisms that operate in each of the organ systems listed.

Students will:

- utilize the scientific process to identify questions pertaining to natural phenomena,
- develop hypotheses,
- collect and analyze quantitative and qualitative data,
- collaborate in the evaluation of the quality of scientific evidence from multiple perspectives toward the goal of reaching a shared objective, and
- communicate analyses and results using written and oral communication.

Lab: Students will:

- Knowledge of Anatomical Body Landmarks; Directional Terms; Body Planes and Sections; Different Cavities and locating organs in cavities.
- Be able to identify organs of the different systems in the human body
- Knowledge of anatomical structures of the Composite Cell.
- Be able to identify the various stages of animal cell division as observed under the microscope
- Knowledge of the parts and function of a Compound Light Microscope. Know the difference between Transmission and Scanning Electron Microscopy.
- Demonstrate knowledge of the different types of Epithelial, Connective and Muscular Tissue. Be able to identify the tissues under the microscope.
- Be able to identify Bones, Bone structures and anatomical markings on the Skeleton.
- Be able to identify muscles on the human torso model. Knowledge of origin, insertion and action required.
- Be able to identify parts of the Human Brain on models, Sheep brain; Structures on Spinal Cord; Anatomical structures on Eye and Ear Model.

Course Outline:

Lecture**:**

- Sciences of Anatomy & Physiology
- Biology of The Cells
- Tissue Organization
- Integumentary System
- Bone Structure and Function
- Articulations
- Muscle Tissue
- Nervous Tissue
- Brain and Cranial Nerves
- Spinal Cord
- Autonomic Nervous System

Lab:

- Anatomical terminology
- Organ Systems
- Microscope
- Cell Structure & Cell Division
- Begin Tissues
- Tissue Identification
- Classification of Tissues (continued)
- Skin (Integumentary system)
- Skeletal system – Axial System
- Muscle Identification
- Brain and Cranial Nerves
- Spinal Cord and Reflex Physiology
- Vision & Hearing

Lecture: Grading/Course Content which Demonstrates Student Achievement of Core Objectives:

Course Grade A: 90-100 B: 80-89 C: 70-79 D: 60-69 F: 0-59

Summary of Course Exams, Quizzes, Activities, and Final	
2 Lecture Exams on campus	45%
Comprehensive Final Exam	20%
Online Quizzes	10%
Assignment	10%
Paper	5%
Project: Power Point Presentation (Uploaded online with voice recording)	5%
Class Participation including course track record	5%
Total	100%

Lab: Grading/Course Content which Demonstrates Student Achievement of Core Objectives:

Course Grade A: 90-100 B: 80-89 C: 70-79 D: 60-69 F: 0-59

Summary of Course Exams, Quizzes, Activities, and Final	
5 Quizzes	33%
2 Lab Exams	67%
Total	100%