



COURSE OUTLINE: BIO190 - BIOLOGY I

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Approved: Bob Chapman, Chair, Health

Course Code: Title	BIO190: BIOLOGY I FOR PADD
Program Number: Name	3065: PRE-HEALTH DIP DGR
Department:	PRE-HEALTH
Academic Year:	2023-2024
Course Description:	This course will enable the learner to develop a foundation in the fundamental concepts of Biological Sciences and application to the systematic study of the human body. The student will study and explore the following areas: cell biology, macromolecules and metabolism, gene expression and regulation, evolution, and human anatomy & physiology for a variety of body systems, including the integumentary, skeletal (including articulations), endocrine, and muscular systems. The learner will apply these concepts with a systemic approach to the study of the human body. In the context of the study of the various organ systems, the learner will be introduced to common pathologies with examples taken from current scientific research. The emphasis will be on understanding the underlying concepts and principles, and applying them to the diversity of body systems.
Total Credits:	4
Hours/Week:	4
Total Hours:	56
Prerequisites:	There are no pre-requisites for this course.
Corequisites:	There are no co-requisites for this course.
This course is a pre-requisite for:	BIO191
Vocational Learning Outcomes (VLO's) addressed in this course:	3065 - PRE-HEALTH DIP DGR
Please refer to program web page for a complete listing of program outcomes where applicable.	VLO 1 Examine biological concepts, processes and systems of the human body, including genetics and epigenetics, as well as the structure, function and properties of the molecules of life, cells, tissues and organ systems in relation to homeostasis, physical development and health.
	VLO 2 Examine concepts, processes and systems of chemistry, including atomic and molecular structure; quantities in chemical reactions; solutions and solubility; acids and bases; as well as organic chemistry and biochemistry in relation to health and the human body.
	VLO 3 Solve numeric problems and interpret data related to health sciences and other science-related fields using mathematical concepts, including algebra and probability, along with descriptive and inferential statistics.
	VLO 4 Use health sciences and other science-related language and terminology appropriately to communicate clearly, concisely, and correctly in written, spoken, and visual forms.



Essential Employability Skills (EES) addressed in this course:	EES 1	Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.
	EES 2	Respond to written, spoken, or visual messages in a manner that ensures effective communication.
	EES 4	Apply a systematic approach to solve problems.
	EES 5	Use a variety of thinking skills to anticipate and solve problems.
	EES 6	Locate, select, organize, and document information using appropriate technology and information systems.
	EES 7	Analyze, evaluate, and apply relevant information from a variety of sources.
	EES 10	Manage the use of time and other resources to complete projects.
	EES 11	Take responsibility for ones own actions, decisions, and consequences.

General Education Themes: Science and Technology

Course Evaluation: Passing Grade: 50%, D
A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.

Books and Required Resources: Human Biology, Anatomy, & Physiology for the Health Sciences by Roscoe
Publisher: Top Hat Monocle Edition: 2nd
ISBN: 9780176739157
or EBOOK

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
1. Upon successful completion of this section the student will be able to demonstrate the ability to understand and to utilize appropriate terminology related to the organization of life.	1.1 Discuss the organization of living things. 1.2 Discuss the organization of the human body. 1.3 List the systems of the human body, the organs present in each, and their general functions. 1.4 Define and apply anatomical terminology, directional terms, body regions, planes, and cavities. 1.5 Define properties of life and homeostasis. 1.6 Describe the relationships among the various organ systems of the body using basic physiological principles.
Course Outcome 2	Learning Objectives for Course Outcome 2
2. Relate the major biological molecules to the functioning of the human body.	2.1 Describe the properties of water and the importance to the human body. 2.2 Explain how macromolecules are formed. 2.3 Describe the properties of organic molecules: proteins, carbohydrates, nucleic acids, and lipids.
Course Outcome 3	Learning Objectives for Course Outcome 3
3. Understand and utilize appropriate terminology related to the structure and function of cells and tissues.	3.1 Describe the cell theory. 3.2 Describe the structure of the plasma membrane. 3.3 Distinguish between prokaryotic and eukaryotic cells. 3.4 Identify and state the function of each of the cellular organelles. 3.5 Distinguish between intracellular and extracellular proteins.

	3.6 Distinguish between the different cell transport processes and provide examples of how each is used in cellular metabolism.
Course Outcome 4	Learning Objectives for Course Outcome 4
4. Describe cellular metabolism and explain when and how different metabolic pathways are used by the body to create ATP.	4.1 Describe the process of cellular respiration. 4.2 Describe energy changes in metabolic reactions: glycolysis, pyruvate oxidation, and the Krebs Cycle. 4.3 Explain electron transport and chemiosmosis. 4.4 Identify other nutrients that can be used to produce ATP and briefly describe the process. 4.5 Explain anaerobic respiration.
Course Outcome 5	Learning Objectives for Course Outcome 5
5. Describe the different tissues found in the human body and discuss the structure and function of the integumentary system.	5.1 Describe the general characteristics of each of the four major tissue classifications as well as specific examples of each. 5.2 Explain matrix, fibres, and cells that constitute tissue. 5.3 Describe the general functions of the integumentary system. 5.4 List the components of the integumentary system. 5.5 Describe the layers of the cutaneous membrane. 5.6 Explain the hypodermis and its relationship to the cutaneous membranes. 5.7 Describe the cells of the cutaneous membrane. 5.8 List the glands of the integumentary system and name their function. 5.9 Apply the knowledge of the integumentary system as it relates to burns, skin and cancer.
Course Outcome 6	Learning Objectives for Course Outcome 6
6. Describe the structure and function of the skeletal system. Identify the bones of the skeletal system and their surface markings.	6.1 List the functions of the skeletal system. 6.2 Classify bones. 6.3 Describe the cells of a bone. 6.4 Identify the parts of a long bone. 6.5 Compare compact and spongy bone. 6.6 Discuss the significance of calcium and homeostasis as it relates to the bone. 6.7 Define skeletal terminology. Apply these terms to describe principle surface markings on bones and the functions of each. 6.8 Identify the bones that make up the appendicular skeleton in varying views. 6.9 Identify bone markings for select bones covered in the appendicular skeleton, in particular areas of articulations and muscle attachment. 6.10 Identify the bones that make up the axial skeleton in varying views. 6.11 Identify bone markings for each bone covered in the axial skeleton. 6.12 Describe the curvatures of the vertebrae. Discuss alternative curves, i.e. scoliosis, kyphosis, lordosis.

	Course Outcome 7	Learning Objectives for Course Outcome 7
	8. Describe the structure and function of the muscular system and identify the major muscle groups.	8.1 Describe the functions of the muscular system. 8.2 Compare the three subtypes of muscle tissue. 8.3 Identify the components of skeletal muscle. 8.4 Describe how names are applied to skeletal muscles. 8.5 Identify the origin, insertion and action for primary superficial muscle groups. 8.6 Describe the neuromuscular junctions. 8.7 Identify the contractile proteins and the related physiology of muscle. 8.8 Describe control of muscle contraction.
	Course Outcome 8	Learning Objectives for Course Outcome 8
	9. Describe the lifecycle of the cell.	9.1 Describe the events that occur during binary fission. 9.2 Explain the cell cycle. 9.3 Distinguish between mitosis and meiosis. 9.4 Explain the role of mitosis and meiosis in the human life cycle. 9.5 Compare the regulation of the cell cycle and cancer.
	Course Outcome 9	Learning Objectives for Course Outcome 9
	10. Demonstrate an understanding of evolution.	10.1 Explain Darwin's theory of Evolution. 10.2 Differentiate between microevolution and macroevolution. 10.3 Apply population genetics.
Course Outcome 10	Learning Objectives for Course Outcome 10	
11. DNA Structure and Function.	11.1 Describe DNA structure. 11.2 Explain DNA replication. 11.3 Discuss DNA mutations.	
Course Outcome 11	Learning Objectives for Course Outcome 11	
12. The Endocrine System	12.1 Describe the functions of the endocrine system. 12.2 Identify the types of hormones. 12.3 Locate and name the endocrine glands of the body. 12.4 Describe the role of the hypothalamus and pituitary gland. 12.5 List the functions of the thyroid, parathyroid, pancreas, adrenal glands, and reproductive organs.	

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Final Exam	20%
Midterm Exam	20%
Tests (4 x 15%)	60%

Date:

August 3, 2023

Addendum:

Please refer to the course outline addendum on the Learning Management System for further information.

