



## COURSE OUTLINE

## BIO190

1

Prepared: Allan Kary Approved:

<b>Course Code: Title</b>	BIO190: BIOLOGY I FOR PADD
<b>Program Number: Name</b>	3065: PRE-HEALTH DIP DGR
<b>Department:</b>	PRE-HEALTH
<b>Semester/Term:</b>	17F
<b>Course Description:</b>	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, Mendelian genetics, evolution, and human anatomy & physiology for a variety of body systems, including the integumentary, the skeletal (including articulations), and the muscular. 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.
<b>Total Credits:</b>	4
<b>Hours/Week:</b>	4
<b>Total Hours:</b>	60
<b>This course is a pre-requisite for:</b>	BIO191
<b>Vocational Learning Outcomes (VLO's):</b>  Please refer to program web page for a complete listing of program outcomes where applicable.	<p>#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.</p> <p>#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.</p> <p>#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.</p> <p>#4. Use health sciences and other science-related language and terminology appropriately to communicate clearly, concisely, and correctly in written, spoken, and visual forms.</p>
<b>Essential Employability</b>	#1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that



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**Skills (EES):**

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

**General Education Themes:**

Science and Technology

**Course Evaluation:**

Passing Grade: 60%, C

**Evaluation Process and Grading System:**

Evaluation Type	Evaluation Weight
10 Quizzes	50%
Final Exam	20%
Term Diagrams	10%
Term Exams	20%

**Books and Required Resources:**

Human Biology: Concepts and Current Issues by Michael D. Johnson  
 Publisher: Pearson Edition: 8th  
 ISBN: 10: 0134042239

**Course Outcomes and Learning Objectives:**

### Course Outcome 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

### Learning Objectives 1.

Discuss the organization of living things.  
 Discuss the organization of the human body.  
 List the systems of the human body, representative organs which are present in each and their general function.



# COURSE OUTLINE

## BIO190

3

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Define and apply anatomical terminology, directional terms, body regions, planes and cavities.  
Define properties of life and homeostasis.  
Describe the relationships among the various organ systems of the body using basic physiological principles.

### **Course Outcome 2.**

Relate the major biological molecules to the functioning of the human body.

### **Learning Objectives 2.**

Describe the properties of water and the importance to the human body.  
Explain how macromolecules are formed.  
Describe the properties of organic molecules: proteins, carbohydrates, nucleic acids and lipids.

### **Course Outcome 3.**

Understand and utilize appropriate terminology related to the structure and function of cells and tissues

### **Learning Objectives 3.**

Describe the cell theory  
Describe the structure of the plasma membrane  
Distinguish between prokaryotic and eukaryotic cells  
Identify and state the function of each of the cellular organelles  
Distinguish between intracellular and extracellular proteins  
Distinguish between the different cell transport processes and provide examples of how each is used in cellular metabolism

### **Course Outcome 4.**

Describe cellular metabolism and explain when and how different metabolic pathways are used by the body to create ATP



# COURSE OUTLINE

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4

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### **Learning Objectives 4.**

Describe the process of cellular respiration  
Describe energy changes in metabolic reactions: glycolysis, pyruvate oxidation and the Krebs Cycle  
Explain electron transport and chemiosmosis  
Identify other nutrients that can be used to produce ATP and briefly describe the process  
Explain anaerobic respiration

### **Course Outcome 5.**

Describe the different tissues found in the human body and discuss the structure and function of the integumentary system

### **Learning Objectives 5.**

Describe the general characteristics of each of the four major tissue classifications  
Explain matrix, fibres, and cells that constitute tissue  
Describe the general functions of the integumentary system  
List the components of the integumentary system  
Describe the layers of the cutaneous membrane  
Explain the hypodermis and its relationship to the cutaneous membranes  
Describe the cells of the cutaneous membrane  
List the glands of the integumentary system and name their function  
Apply the knowledge of the integumentary system as it relates to burns, skin and cancer

### **Course Outcome 6.**

Describe the structure and function of the skeletal system. Identify the bones of the skeletal system and their surface markings.

### **Learning Objectives 6.**

List the functions of the skeletal system  
Classify bones



# COURSE OUTLINE

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5

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Describe the cells of a bone  
Identify the parts of a long bone  
Compare compact and spongy bone  
Discuss the significance of calcium and homeostasis as it relates to the bone  
Define skeletal terminology. Apply these terms to describe principle surface markings on bones and the functions of each  
Identify the bones that make up the appendicular skeleton in varying views  
Identify bone markings for select bones covered in the appendicular skeleton, in particular areas of articulations and muscle attachment  
Identify the bones that make up the axial skeleton in varying views  
Identify bone markings for each bone covered in the axial skeleton  
Describe the curvatures of the vertebrae. Discuss alternative curves, i.e. scoliosis, kyphosis, lordosis

### **Course Outcome 7.**

Identify and classify the different types of joints in the human body

### **Learning Objectives 7.**

Classify joints and describe their movement.

### **Course Outcome 8.**

Describe the structure and function of the muscular system and identify the major muscle groups

### **Learning Objectives 8.**

Describe the functions of the muscular system  
Compare the three subtypes of muscle tissue  
Identify the components of skeletal muscle  
Describe how names are applied to skeletal muscles  
Identify the origin, insertion and action for primary superficial muscle groups  
Describe the neuromuscular junctions  
Identify the contractile proteins and the related physiology of muscle  
Describe control of muscle contraction



# COURSE OUTLINE

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6

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### **Course Outcome 9.**

Describe the lifecycle of the cell

### **Learning Objectives 9.**

Describe the events that occur during binary fission

Explain the cell cycle

Distinguish between mitosis and meiosis

Explain the role of mitosis and meiosis in the human life cycle

Compare the regulation of the cell cycle and cancer

### **Course Outcome 10.**

Demonstrate an understanding of genetic inheritance

### **Learning Objectives 10.**

Describe Mendel's theory of inheritance of dominant and recessive traits

Calculate the probability of various genotypes and phenotypes using Punnett Squares

Calculate the probability of various genotypes and phenotypes in a dihybrid cross

Describe non-Mendelian inheritance patterns

Identify the most common human, single-gene disorders

### **Course Outcome 11.**

Demonstrate an understanding of evolution

### **Learning Objectives 11.**

Explain Darwin's theory of Evolution

Differentiate between microevolution and macroevolution

Apply population genetics



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7



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**Date:**

Wednesday, August 30, 2017

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