Institute of Zoology
Faculty of Life Sciences
University of the Punjab, Lahore

Course Outline

Programme	BS Zoology	**Course Code**	**ZOOL-307**	**Credit Hours**	2
Course Title	**Physiology-I**				

Course Introduction

Physiology refers to the scientific study of regular functions in living organisms. This study focuses on how certain organisms survive, work and function. It also studies how all aspects of the body of that organism, such as biological, physical, and chemical, are interrelated and vital to the survival of that organism.

Learning Outcomes

Following the completion of this course, each student should have:

1. An understanding of critical concepts, processes, and factual information in the performance of functions and changing conditions.
2. A knowledge of resources for finding the solution for strategies to sustain diverse forms of animal life kept and in wild in normal and abnormal conditions.
3. The ability to utilize knowledge of animal physiology in critical study and for making intelligent decisions in professional life.

	Course Content	**Assignments/Readings**
Week 1	**Central themes in Physiology:** Structure-Function Relationship	
	Adaptations, Homeostasis	
Week 2	Conformity, Regulation	
	Physiological basis of Neuronal Function: Mechanisms in Resting Membrane Potentials, Electrogenic ion pump, Donnan equilibrium	
Week 3	Diffusional potentials, ion channels	
	Ionic mechanisms in action potentials	
Week 4	Roles of ion channels	
	Properties of action potential	
Week 5	Propagation of Action Potential, Synaptic transmission	
	Structure and function of chemical synapse, Structure and function of electrical synapse	
Week 6	Synaptic receptors	
	Neurotransmitters	
Week 7	Excitatory postsynaptic potential	
	Inhibitory postsynaptic potential; Presynaptic inhibition	
Week 8	Integration at synapses, Facilitation, Posttetanic Potentiation.	
	Receptors Physiology: Transduction; Sensory coding; Mechanoreception: Hair cell mechanism particularly in acoustico-lateralis system of vertebrates	

Week 9	Cellular and molecular mechanisms in taste and olfactory reception; Photoreception: Ultrasttructure of photoreceptors, Photochemistry, Phototransduction and physiological basis of color vision.	
	Chemical Messenger and Regulators/Endocrine Physiology: Types and functions of secretions. An overview of hormones, their chemistry and physiological roles of Hypthalamus,	
Week 10	Pituitary, Thyriod, Parathyroid and associated structures, Endocrine pancreas, Gastroenteropancreatic system	
	Adrenal medulla, Adrenal cortex, Ovary, Testis and placenta.	
Week 11	A generalized model account of hormone synthesis, storage and secretion (a peptide hormone model and steroid hormones);	
	Hormonal interactions in metabolic and developmental function	
Week 12	Water and electrolyte balance; reproduction	
	Glycemia and calcium hormostasis	
Week 13	Mechanisms of action in hormones involving membrane receptors and nuclear modulated gene expression	
	Movements and Muscles: Structural basis of muscle contraction	
Week 14	Molecular structures of contractile components and their interaction	
	Sarcoplasmic reticulum	
Week 15	Role of calcium	
	Calcium pump and membrane mechanisms in regulation of contraction	
Week 16	Types of muscle fibers	
	Types of muscle contractions	

Textbooks and Reading Material

Reference Books:

1. Guyton, A.C. and Hall, J.E., 2020. Textbook of Medical Physiology, 14th Ed.. W.B. Saunders Company, Philadelphia. B
2. Withers, P.C., 1992. Comparative Animal Physiology. Saunders College Publishing, Philadelphia.
3. Randall, D., Burggren, W., French, K. and Fernald, R., 2015. Eckert Animal Physiology: Mechanisms and Adaptations, 6th ed. W.H. Freeman and Company, New York

Teaching Learning Strategies

Learning Objectives:

At the end of the course the student will be able to:

1. Understand on the molecular and cellular mechanisms of physiological function as the basis of unity in diverse animals e.g. membrane excitability, exchange of respiratory gases, removal of nitrogenous wastes tissue, osmotic and organ physiological mechanisms underlying animal homeostasis and temperature effects.
2. Grasp the development of performing the function developed at molecular and cellular level in the complexity of the animals such as chemical & nervous integration, respiratory and excretory functions.
3. Know the strategy acquired to perform the functions in diverse environment such as in dry & aquatic and cold and hot at molecular and cellular level and regulations to achieve strategy by chemical and nervous regulation at organ levels.
4. Comprehend the concepts in homeostasis and integration in sustaining the life in constantly changing conditions.

Teaching Strategies:

1. Interactive Lectures:

Teaching will be a combination of class lectures, class discussions, and group work. Short videos /films will be shown on occasion.

Assignments: Types and Number with Calendar

Group Presentations:

- The sessional work will be a combination of written assignments, class quizzes, presentation, and class participation/attendance