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

Programme	BS Zoology	**Course Code**	**ZOOL-207**	**Credit Hours**	2
Course Title	**Animal Form And Function–II**				

Course Introduction

The Objectives of the courses are:

1. To teach about animals' diversity adapted in different strategies' for performance of their similar functions through modifications in body parts in past and present times.
2. To impart understanding of diverse strategic structural adaptations in each of the functional systems of nutrition, excretion, osmoregulation and reproduction and development for effective survival in their specific conditions.
3. To understand the organ systems, their specialization and coordination with each other and constantly changing internal and external environment, inside and outside the animal's body.
4. To embrace the phenomena in basic structure of each system that determines its particular function.

Learning Outcomes

On the completion of the course, the students will:

1. Acquire the concept that for the performance of a function for example exchange of respiratory gases the different forms are adapted in the environments e.g. gills in aquatic and lungs in terrestrial environment.
2. Understand that diverse forms adapted to perform the same functions are because of the different past and present conditions.
3. Solve of emergence of diversity of forms for the performance of similar function.
4. Analyze the requirements of diverse forms for the performance of similar function in their past and present needs.
5. Evaluate the adaptations in forms for its efficiency in managing the function in differing situations in the past and present times.
6. Demonstrate that a form is successfully adapted to perform a function adequately and successfully.

Course Content		**Assignments/Readings**
Week 1	Internal transport and circulatory systems in invertebrates	
	Characteristics of invertebrate coelomic fluid, hemolymph, and blood cells	
Week 2	Transport systems in vertebrates	
	Characteristics of vertebrate blood, blood cells and vessels	
Week 3	The hearts and circulatory systems of bony fishes	
	The hearts and circulatory systems of Amphibians, reptiles, birds and mammals	
Week 4	The lymphatic system	
	Immunity: nonspecific defenses, the immune response	
Week 5	**Gas exchange:** Respiratory surfaces, Invertebrate respiratory systems.	
	Vertebrate respiratory systems: Cutanous exchange, Gills	

Week 6	**Vertebrate respiratory systems:** Lungs, Lung ventilation.	
	Evolution of nutrition; the metabolic fates of nutrients in heterotrophs; digestion	
Week 7	Animal strategies for getting and using food, diversity in digestive structures of invertebrates	
	Animal strategies for getting and using food, diversity in digestive structures of vertebrates.	
Week 8	**Homeostasis and Temperature Regulation;** The Impact of Temperature on Animal Life	
	Homeostasis and Temperature Regulation; Heat Gains and Losses	
Week 9	**Homeostasis and Temperature Regulation;** Some Solutions to Temperature Fluctuations; Temperature Regulation in Invertebrates	
	Homeostasis and Temperature Regulation; Some Solutions to Temperature Fluctuations; Temperature Regulation in Fishes, Amphibians and Reptiles	
Week 10	**Homeostasis and Temperature Regulation;** Some Solutions to Temperature Fluctuations; Temperature Regulation in birds	
	Homeostasis and Temperature Regulation; Some Solutions to Temperature Fluctuations; Temperature Regulation in mammals	
Week 11	Heat Production in Birds	
	Heat Production in Mammals	
Week 12	Control of Water and Solutes (Osmoregulation and Excretion)	
	Invertebrate Excretory system	
Week 13	Vertebrate Excretory Systems; How vertebrates achieve osmoregulation	
	Vertebrate kidney variations.	
Week 14	Asexual reproduction in invertebrates	
	Advantages and disadvantages of asexual reproduction	
Week 15	Sexual reproduction in invertebrates	
	Advantages and disadvantages of sexual reproduction	
Week 16	Sexual reproduction in vertebrates; reproductive strategies	
	Examples of reproduction among various vertebrate classes	
Textbooks and Reading Material		

Text Books:

1. Miller, S.A. and Harley, J.P., 2019. Zoology, 11th Ed. (International), Singapore: McGraw-Hill.

Reference Books:

1. Pechenik, J.A. 2013. Biology of Invertebrates, 4th Ed. (International),Singapore: McGraw-Hill.
2. Hickman, C.P., Roberts, L.S., Larson, A. 2004. Integrated Principlesof Zoology, 11th Ed. (International), Singapore: McGraw-Hill.
3. Campbell, N.A. 2002. Biology, 6th Ed. Menlo Park, California: Benjamin/Cummings Publishing Company, Inc.
4. Kent, G.C., Miller, S. 2001. Comparative Anatomy of Vertebrates. NewYork: McGraw-Hill.
5. Hickman, C.P., Kats, H.L. 2000. Laboratory Studies in IntegratedPrinciples of Zoology. Singapore: McGraw-Hill.

Teaching Learning Strategies

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.

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Exam	35%	Written Assessment at the mid-point of the semester.
2.	Sessional Work	25%	Continuous assessment includes: Classroom participation, assignments, presentations, viva voce, attitude and behavior, hands-on-activities, short tests, projects, practical, reflections, readings, quizzes etc.
3.	Final Exam	40%	Written Examination at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.