

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



Programme	BS Zoology	Course Code	ZOOL-101	Credit Hours	2
Course Title	Animal Diversity-I				
Course Introduction					
This course provides an in-depth exploration of the diversity, structure, function, and evolutionary relationships of protozoans, parazoans, radiates, and protostome phyla. Students will study the taxonomy, morphology, physiology, ecological roles, and evolutionary significance of these groups, with a focus on comparative analysis.					
Learning Outcomes					
On the completion of the course, the students will:					
<ol style="list-style-type: none"> 1. Understand the distinguishing features and classification of protozoans, parazoans, radiates, and protostome phyla. 2. Explore the evolutionary relationships and phylogeny of these groups. 3. Examine the anatomical and physiological adaptations of each group. 4. Investigate the ecological roles and life histories of these organisms. 5. Develop skills in comparative analysis and scientific observation. 					
Course Content					Assignments/Readings
Week 1	Introduction to Protozoans, General characteristics and classification				
	Major protozoan groups (e.g., Amoebozoa, Ciliophora, Apicomplexa, Euglenozoa)				
Week 2	Modes of locomotion (pseudopodia, cilia, flagella)				
	Feeding mechanisms and nutrition				
Week 3	Reproduction and life cycles				
	Ecological roles of protozoans				
Week 4	Characteristics and classification of Porifera (sponges)				
	General structure and function of sponges				
Week 5	Anatomy, Physiology, and Ecology of Parazoa				
	Modes of reproduction in sponges				
Week 6	Ecological roles and importance of sponges				
	Introduction to Radiata, Characteristics and classification of Cnidaria (e.g., hydroids, jellyfish, corals) and Ctenophora (comb jellies)				
Week 7	General structure and function of cnidarians and ctenophores				
	Modes of reproduction in cnidarians and ctenophores				
Week 8	Ecological roles and importance of cnidarians and ctenophores				

	Introduction to Protostomes, Major protostome groups (e.g., Platyhelminthes, Nematoda, Mollusca, Annelida, Arthropoda)	
Week 9	Characteristics and classification of Platyhelminthes	
	Anatomy and physiology of flatworms, Reproduction and development	
Week 10	Ecological roles and parasitism	
	Characteristics and classification of Nematoda	
Week 11	Anatomy and physiology of nematodes, Reproduction and development	
	Ecological roles and parasitism	
Week 12	Characteristics and classification of Annelida	
	Anatomy and physiology of annelids, Reproduction and development	
Week 13	Ecological roles and importance	
	Characteristics and classification of Mollusca	
Week 14	Anatomy and physiology of mollusks, Reproduction and development	
	Ecological roles and economic importance	
Week 15	Characteristics and classification of Arthropoda	
	Anatomy and physiology of insects and myriapods	
	Anatomy and physiology of crustaceans and chelicerates	
Week 16	Comparative Analysis and Evolutionary Trends, of protozoans, parazoans, radiates, and protostomes	
	Evolutionary trends and phylogenetic relationships	
Textbooks and Reading Material		
<ol style="list-style-type: none"> 1. Miller, A.S. and Harley, J. B. 1999, 2002, 2007, 2009, 2012 and 2016 Zoology, 4th , 5th, 6th, 7th, 8th 9th & 10th Edition (International), Singapore : McGraw Hill. 2. Hickman, C.P., Roberts, L.C. and Larson, A., 2018. Integrated principles of zoology, 15th Edition (International), Singapore: McGRAW-Hill. 3. Hickman, C.P., Roberts, L.C/, AND Larson, A., 2007. Integrated principles of zoology, 12th& 13th Edition (International). Singapore: McGraw-Hill. 4. Pechenik, J.A., 2015. Biology of invertebrates, 7th Edition, (International), Singapore: McGraw-Hill. 5. Kent, G. C. and Miller, S., 2001. Comparative anatomy of vertebrates New York: McGraw-Hill. 6. Campbell, N.A., 2002; Biology 6th Edition, Menlo Park, California; Benjamin Cummings Publishing Company, Inc. 7. Miller, S.A., 2002. General zoology laboratory manual. 5th Edition (International), Singapore: McGraw-Hill. 8. Hickman, C.P. and Kats, H.L., 2000. Laboratory Studies in integrated principal of zoology. Singapore: McGraw-Hill. 9. Edward E. Ruppert, Richard S. Fox, Robert D. Barnes 2003 Invertebrate Zoology: A Functional Evolutionary Approach 7th Edition Cengage Learning 10. Jan Pechenik 2015 Biology of the Invertebrates, 7th Edition McGraw Hill. 		
Teaching Learning Strategies		

This course will be based on following outcomes:

Learning Objectives:

1. Acquire the basic concepts of invertebrates with explanation of evolutionary origin and diversification.
2. Understand invertebrate organismal concepts in laboratory and field.
3. Demonstrate major evolutionary innovations for invertebrates with functional importance.
4. Understand how reproduction and development occurred and able to breed animal in the laboratory/field
5. Analyze economic and ecological importance of invertebrates.

Teaching Strategies:

1. Interactive Lectures:

Objective: Provide foundational knowledge on the taxonomy, morphology, physiology, and evolution of Protozoans, Parazoa, Radiata, and Protostome Phyla

Strategy:

- Use multimedia presentations (slides, videos, animations) to illustrate concepts.
- Incorporate real-life examples and case studies to enhance understanding.
- Encourage active participation through question-and-answer sessions and small group discussions.

2. Laboratory Sessions:

Objective: Develop hands-on skills in identifying and analyzing anatomical structures and physiological processes.

Assignments: Types and Number with Calendar

Group Presentations:

Objective: Foster collaboration and deeper understanding through research and peer teaching.

Strategy:

- Assign group projects on specific topics such as evolutionary relationships, ecological roles, or conservation issues.
- Require groups to prepare and deliver presentations, promoting peer learning.
- Incorporate peer assessment and feedback to improve learning outcomes and presentation skills.

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	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 Assessment	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.