

**University of the Punjab,
Lahore
Course Outline**



Programme	BS	Course Code	NB-107	Credit Hours	3(3+0)
Course Title	General Zoology				
Course Introduction					
This course provides an in-depth exploration of the diversity, structure, function, and evolutionary relationships of various 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 definition and scope of zoology 2. Recognize the basic chemical components of living organisms 3. Differentiate between prokaryotic and eukaryotic cells 4. Describe the processes of cellular respiration and photosynthesis 5. Understand the basic principles of Mendelian genetics 6. Explain the role of chromosomes in inheritance 7. Understand the key concepts of evolutionary theory 8. Understand the principles of biological classification 9. Describe the major groups of animals 10. Explain mammalian anatomy, physiology, and behavior 11. Understand the principles of ecology and ecosystem function 12. Appreciate the future directions of zoological research and its importance 					
Course Content					Assignments/Readings
Week 1	Introduction to Zoology				
	<ol style="list-style-type: none"> 1. Definition and scope of zoology 2. History and branches of zoology 3. Importance of zoology in understanding life 				
Week 2	The Chemical Basis of Life				
	<ol style="list-style-type: none"> 1. Elements and compounds essential to life 2. Structure and function of biomolecules (carbohydrates, lipids, proteins, nucleic acids) 				
Week 3	Cell Structure and Function				
	<ol style="list-style-type: none"> 1. Prokaryotic vs. eukaryotic cells 2. Cell organelles and their functions 3. Cell membrane structure and transport mechanisms 				
Week 4	Cellular Metabolism and Energy				
	<ol style="list-style-type: none"> 1. Enzymes and their role in metabolism 2. ATP and energy transfer 3. Cellular respiration and photosynthesis 				
Week 5	Principles of Genetics				
	<ol style="list-style-type: none"> 1. Mendelian genetics 2. Chromosomes and inheritance 3. Genetic variation and mutation 				

Week 6	Evolutionary Biology	
	<ol style="list-style-type: none"> 1. The theory of evolution 2. Natural selection and adaptation 3. Evidence for evolution 	
Week 7	Animal Diversity and Classification	
	<ol style="list-style-type: none"> 1. Principles of taxonomy and classification 2. Overview of the animal kingdom 3. Phylogenetic trees and evolutionary relationships 	
Week 8	Invertebrates I: Porifera, Cnidaria, and Platyhelminthes	
	<ol style="list-style-type: none"> 1. Characteristics and examples of Porifera (sponges) 2. Cnidaria (jellyfish, corals) and their life cycles 3. Platyhelminthes (flatworms) and their adaptations 	
Week 9	Invertebrates II: Nematoda, Annelida, and Mollusca	
	<ol style="list-style-type: none"> 1. Characteristics and examples of Nematoda (roundworms) 2. Annelida (segmented worms) and their biology 3. Mollusca (snails, clams, octopuses) and their diversity 	
Week 10	Invertebrates III: Arthropoda and Echinodermata	
	<ol style="list-style-type: none"> 1. Characteristics and examples of Arthropoda (insects, spiders, crustaceans) 2. Echinodermata (starfish, sea urchins) and their unique features 	
Week 11	Chordates I: Fish and Amphibians	
	<ol style="list-style-type: none"> 1. Characteristics of Chordates 2. Overview of fish diversity and adaptations 3. Amphibian life cycles and ecological roles 	
Week 12	Chordates II: Reptiles and Birds	
	<ol style="list-style-type: none"> 1. Evolution and adaptations of reptiles 2. Bird anatomy, physiology, and behavior 3. Reptile and bird conservation issues 	
Week 13	Chordates III: Mammals	
	<ol style="list-style-type: none"> 1. Characteristics and diversity of mammals 2. Evolution and adaptive radiation of mammals 3. Mammalian anatomy, physiology, and behavior 	
Week 14	Animal Behavior	
	<ol style="list-style-type: none"> 1. Ethology and the study of animal behavior 2. Innate vs. learned behaviors 3. Social behavior and communication in animals 	
Week 15	Ecology and Conservation	
	<ol style="list-style-type: none"> 1. Principles of ecology and ecosystem dynamics 2. Population ecology and species interactions 3. Conservation biology and the impact of human activities 	
Week 16	Human Impact and the Future of Zoology	
	<ol style="list-style-type: none"> 1. Human impacts on wildlife and ecosystems 2. Emerging issues in zoology and conservation 3. The future of zoological research and its applications 	
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.
11. Campbell, N.A. Biology. 9th Ed. 2011. Menlo Park, California Benjamin/Cummings Publishing Company, Inc.
12. Miller, S.A. and Harley, J.B. 2010. Zoology, 8th Edition (International) Singapore: McGraw Hill.
13. Hickman, C.P., Roberts, L.S. and Larson, A. Integrated Principles of Zoology, 14th Edition (International), 2009. Singapore: McGraw-Hill.
14. Verma P. S. Chordate Zoology 2010 S. Chand Publishing, 2010

Teaching Learning Strategies

This course will be based on following outcomes:

Learning Objectives:

1. Understand the definition and scope of zoology
2. Recognize the basic chemical components of living organisms
3. Differentiate between prokaryotic and eukaryotic cells
4. Describe the processes of cellular respiration and photosynthesis
5. Understand the basic principles of Mendelian genetics
6. Explain the role of chromosomes in inheritance
7. Understand the key concepts of evolutionary theory
8. Understand the principles of biological classification
9. Describe the major groups of animals
10. Explain mammalian anatomy, physiology, and behavior
11. Understand the principles of ecology and ecosystem function
12. Appreciate the future directions of zoological research and its importance

Teaching Strategies:

1. Interactive Lectures:

Objective: Provide foundational knowledge on the taxonomy, morphology, physiology, and evolution of animals

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.

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		
1.	Midterm Assessment		
2.	Formative Assessment		
3.	Final Assessment		