



**Maharaja Surajmal Brij University
Bharatpur (Rajasthan)**

Syllabus

Multidisciplinary Course

Subject: Zoology

Semester – V

प्रभारी अकादमिक प्रथम

MDC-ZOO-20T-3001-TAXONOMY
 V -Semester - [ZOOLOGY]

Semester	Code of the Course	Title of the Course/Paper			NHEQF Level	Credits
V	MDC-ZOO-20T-3001	TAXONOMY			5	4
Level of Course	Type of the Course	Credit Distribution			Offered to NC Student	Course Delivery Method
		Theory	Practical	Total		
5	MDC	4	0	4	Yes	Lectures: 60
List of Programme Codes in which Offered as Minor Discipline		Not Applicable				
Objectives of the Course:		The learning objectives of this course are as follows: <ul style="list-style-type: none"> • Develop a comprehensive understanding of the taxonomy fundamentals through historical and modern classification principles. • Examine different levels of biological organization from cellular to organ systems. • Gain insights into invertebrate and vertebrate diversity, including classification and ecological roles. • Understand key physiological processes in digestion, respiration, circulation, and more. • Learn about species concepts and classification systems within the five-kingdom model. 				

MDC-ZOO-20T-3001-TAXONOMY

Unit-I

Develop a comprehensive understanding of the Historical Perspective and Principles of Classification: Overview of Early Classification Systems and Modern Concepts of Taxonomy; Basic Principles of Classification: Hierarchy, Nomenclature, Identification, and Classification

4 Hrs.

Taxonomic Nomenclature and Classification System: Binomial Nomenclature and Its Rules; International Code of Zoological Nomenclature (ICZN); Artificial, Natural, and Phylogenetic Classification Systems; Five-Kingdom Classification (Monera, Protista, Fungi, Plantae, Animalia); Species Concept: Morphological, Biological, Phylogenetic

4 Hrs.

Levels of Organization and Body Plans: Cellular Organization (Unicellular, Multicellular); Tissue and Organ Level Organization; Body Symmetry (Radial, Bilateral); Germ Layers (Diploblastic, Triploblastic); Body Cavity (Acoelomate, Pseudocoelomate, Coelomate); Segmentation (Metamerism)

4 Hrs.

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प्रभारी अकादमिक प्रथम

Basis of Zoological Classification: Morphological, Anatomical, Cytological, Biochemical, Physiological, Behavioral, and Ecological Characters **3 Hrs.**

Unit-II

Outline Classification of Invertebrates: From Protozoa to Echinodermata **2 Hrs.**

Life Cycle and Reproduction: Brief Overview of Paramecium, Sycon, Obelia, Taenia solium, Ascaris, Earthworm, Cockroach, Pila, and Starfish **9 Hrs.**

Social Organization in Invertebrates: Understanding the Social Structures in Invertebrates **2 Hrs.**

Economic Importance of Invertebrates: The Role and Significance of Invertebrates in Various Sectors **2 Hrs.**

Unit-III

Agnatha, Pisces, and Amphibia: General Characteristics of Agnatha; Classification of Cyclostomes up to Class; Chondrichthyes and Osteichthyes; Amphibia: Origin of Tetrapoda (Evolution of Terrestrial Ectotherms); General Characteristics and Classification up to Order; Parental Care in Amphibia **7 Hrs.**

Reptilia and Aves: General Characteristics and Classification up to Order in Reptiles; General Characteristics and Classification up to Order in Aves **4 Hrs.**

Mammals: General Characteristics and Classification up to Order; Affinities of Prototheria; Distribution of Vertebrates in Different Realms **4 Hrs.**

Unit-IV

Digestive and Excretory Mechanism: Mechanism of Digestion in Various Parts of the Alimentary Canal; Types of Nitrogenous Excretory End Products; Functional Architecture of Nephron; Mechanism of Urine Formation **4 Hrs.**

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प्रभारी अकादमिक प्रथम

Respiratory and Circulatory Systems: Mechanism and Control of Breathing; Exchange of Gases; Transportation of Oxygen and Carbon Dioxide in Blood; Composition and Functions of Blood; Structure and Function of Heart **4 Hrs.**

Nervous and Muscular Systems: Functional Architecture of a Neuron and Its Types; Origin and Propagation of Nerve Impulse; Functional Architecture of Skeletal Muscles; Mechanism of Muscle Contraction. **3 Hrs.**

Endocrine System: Secretions and Functions of Endocrine Glands: Pituitary, Adrenal, Thyroid, Parathyroid, Pancreas, Testis, and Ovary **4 Hrs.**

Suggested Books and References

1. Biology, N.A. Campbell, J.B. Reece, & L.A. Urry, 2008, Pearson.
2. Vertebrate Life, F.H. Pough, C.M. Janis, & J.B. Heiser, 2005, Pearson.
3. Mammalogy: Adaptation, Diversity, Ecology, G.A. Feldhamer, L.C. Drickamer, J.F. Merritt, & S.H. Vessey, 2007, Johns Hopkins University Press.
4. Gastropods: Morphology and Anatomy, C.P. Hickman et al., 2008, Academic Press.
5. Modern Textbook of Zoology – Vertebrates, R.L. Kotpal, 2016, Rastogi Publications.
6. The Life of Vertebrates, J.Z. Young, 2004, Oxford University Press.
7. Invertebrate Zoology, Ruppert, Fox, & Barnes, 2004, Cengage Learning, India.
8. Biology of the Invertebrates, J.A. Pechenik, 2015, McGraw-Hill Education.
9. The Invertebrates: A New Synthesis, R.S.K. Barnes, P. Calow, P.J.W. Olive, D.W. Golding, & J.I. Spicer, 2002, Blackwell Science.
10. A Review of Medical Physiology, William F. Ganong, 2005, McGraw Hill.
11. Text Book of Animal Physiology, Veer Bal Rastogi, Kedarnath Ramnath, Meerut.
12. Eckert Animal Physiology, David R., Burggren Wand French K, 2001, W.H. Freeman & Company, New York.

1. <https://www.ncbi.nlm.nih.gov/books/NBK279393/>
2. <https://youtu.be/I6xrTOYnhG0>
3. <https://youtu.be/rQDsAI9uDyI>
4. <https://youtu.be/Hx8mXeRtOlo>
5. https://youtu.be/vA26UI_htIU
6. https://onlinecourses.swayam2.ac.in/cec19_bt02/preview
7. https://onlinecourses.nptel.ac.in/noc20_bt42/preview (Animal Physiology)
8. Virtual Labs (<http://www.vlab.co.in>)

Course Learning Outcome:

- Grasp the fundamental principles of classification, including binomial nomenclature, and differentiate between artificial, natural, and phylogenetic classification systems.
- Examine cellular, tissue, and organ-level organization, body symmetry, germ layers, body cavities, and segmentation across various organisms.
- Study the classification, life cycles, and ecological roles of invertebrates and vertebrates, from protozoa to mammals, understanding their evolutionary significance.
- Gain insights into the mechanisms of digestion, respiration, circulation, and excretion, alongside the functional architecture of the nervous and muscular systems.
- Understand the roles and physiological impact of major endocrine glands, such as the pituitary, adrenal, thyroid, and pancreas, on the body's functioning.