

S.V.A. Government College
Department of Zoology

Programme outcomes, Programme Specific outcomes & Course outcomes

B.Sc Zoology - Semester I

Programme Outcomes (POs) for B.Sc Zoology

PO1. Scientific Knowledge: Apply fundamental knowledge of Zoology to identify, analyze, and understand biological phenomena.

PO2. Problem Analysis: Analyze biological problems using principles from classical and modern biology.

PO3. Environment and Sustainability: Understand the role of biodiversity and promote sustainable development and environmental conservation.

PO4. Ethics: Practice ethical standards in biological research and animal handling.

PO5. Communication: Communicate biological concepts effectively through oral, written, and digital forms.

PO6. Modern Tool Usage: Use appropriate laboratory tools and techniques in the study of animal biology.

PO7. Life-long Learning: Recognize the importance of life-long learning to adapt to new biological challenges and developments.

Programme Specific Outcomes (PSOs)

PSO1. Gain a foundational understanding of the diversity of animal life, classical biology, and evolutionary principles.

PSO2. Develop competency in identifying, classifying, and analyzing invertebrates and vertebrates using morphological and anatomical features.

PSO3. Demonstrate practical skills in dissection, slide preparation, and the use of laboratory equipment.

PSO4. Understand the historical contributions of classical biologists and their relevance to modern biological sciences.

Course Title: Introduction to Classical Biology

Course Outcomes (COs)

CO1. Describe the contributions of classical biologists like Aristotle, Linnaeus, and Darwin to biological sciences.

CO2. Differentiate between major animal phyla based on key characteristics and classification.

CO3. Explain basic concepts of taxonomy and binomial nomenclature.

CO4. Understand the principles of evolutionary biology and natural selection.

CO5. Develop observational and analytical skills through laboratory-based exercises.

CO-PO & CO-PSO Mapping Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	2	1	3	2	1	2	3	2	1	3
CO2	3	3	2	2	2	2	2	3	3	2	2
CO3	3	2	1	1	2	2	2	3	2	1	2
CO4	3	3	3	2	2	1	3	3	2	1	2
CO5	2	2	1	1	2	3	2	2	3	3	2

Legend:

3 – Strongly correlated | 2 – Moderately correlated | 1 – Weakly correlated | 0 – Not correlated

Course Title: Introduction to Applied Biology

Course Outcomes (COs)

CO1. Explain the scope and significance of applied biology in daily life and industry.

CO2. Identify biological applications in agriculture, medicine, and environmental management.

CO3. Discuss the use of biotechnology and genetic engineering in improving living conditions.

CO4. Demonstrate basic laboratory skills and understanding of bio-instruments.

CO5. Analyze ethical, environmental, and social implications of applied biological practices.

CO-PO & CO-PSO Mapping Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	2	2	2	2	1	2	3	2	1	3
CO2	3	3	3	2	2	2	2	3	3	2	2
CO3	3	3	2	2	2	2	3	3	3	2	3
CO4	2	2	1	1	2	3	2	2	2	3	2
CO5	2	2	3	3	2	1	3	2	3	1	2

Legend:

3 – Strongly correlated | 2 – Moderately correlated | 1 – Weakly correlated | 0 – Not correlated

B.Sc Zoology - Semester II

Course Title: Animal Diversity-I: Biology of Non-Chordates

Course Outcomes (COs)

CO1. Explain the general characteristics and classification of major non-chordate phyla.

CO2. Describe the structure and function of representative organisms from Porifera to Echinodermata.

CO3. Compare the anatomical and physiological adaptations among non-chordate groups.

CO4. Perform dissections and microscopic studies of non-chordate specimens.

CO5. Recognize the ecological significance of invertebrates and their role in environmental balance.

CO-PO & CO-PSO Mapping Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	2	1	1	2	1	2	3	2	1	2
CO2	3	3	2	1	2	2	2	3	3	2	2
CO3	3	3	2	2	2	2	2	3	3	2	3
CO4	2	2	1	2	2	3	2	2	3	3	2
CO5	2	2	3	2	2	2	3	2	2	2	3

Legend:

3 – Strongly correlated | 2 – Moderately correlated | 1 – Weakly correlated | 0 – Not correlated

Course Title: Cell and Molecular Biology

Course Outcomes (COs)

CO1. Describe the structure and function of cell organelles and cell membranes.

CO2. Explain the molecular mechanisms of DNA replication, transcription, and translation.

CO3. Illustrate the stages of the cell cycle and mechanisms of cell division.

CO4. Analyze mutations and gene regulation mechanisms in prokaryotes and eukaryotes.

CO5. Perform basic molecular biology experiments including DNA extraction and gel electrophoresis.

CO-PO & CO-PSO Mapping Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	2	1	1	2	1	2	3	2	1	2
CO2	3	3	2	2	2	2	2	3	3	2	3
CO3	3	3	1	2	2	2	2	3	2	2	2
CO4	3	3	2	3	2	2	3	3	3	2	3
CO5	2	2	1	2	2	3	2	2	2	3	2

Legend:

3 – Strongly correlated | 2 – Moderately correlated | 1 – Weakly correlated | 0 – Not correlated

B.Sc Zoology - Semester III

Course Title: Animal Diversity-II: Biology of Chordates

Course Outcomes (COs)

CO1. Describe the general characteristics and classification of chordates.

CO2. Explain the morphology and organ systems of representative vertebrates from Pisces to Mammalia.

CO3. Interpret evolutionary trends and adaptations in chordate groups.

CO4. Conduct dissections and identify key anatomical features of chordates.

CO5. Evaluate the ecological and conservation importance of chordate biodiversity.

CO-PO & CO-PSO Mapping Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	2	1	1	2	1	2	3	2	1	2
CO2	3	3	2	1	2	2	2	3	3	2	2
CO3	3	3	2	2	2	2	3	3	3	2	3
CO4	2	2	1	2	2	3	2	2	3	3	2
CO5	2	2	3	3	2	2	3	2	2	2	3

Legend:

3 – Strongly correlated | 2 – Moderately correlated | 1 – Weakly correlated | 0 – Not correlated

Course Title: Principles of Genetics

Course Outcomes (COs)

CO1. Explain the Mendelian laws of inheritance and extensions including gene interaction and linkage.

CO2. Describe chromosomal basis of inheritance and sex determination.

CO3. Illustrate mutations, chromosomal aberrations, and genetic disorders.

CO4. Solve genetic problems involving pedigree analysis, gene mapping, and probability.

CO5. Demonstrate the application of genetic principles in biotechnology, medicine, and agriculture.

CO-PO & CO-PSO Mapping Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	3	1	1	2	1	2	3	3	1	2
CO2	3	3	2	1	2	2	2	3	3	2	2
CO3	3	3	2	2	2	2	2	3	3	2	3
CO4	2	3	1	2	2	3	2	2	3	3	2
CO5	2	2	3	3	2	3	3	2	2	3	3

Legend:

3 – Strongly correlated | 2 – Moderately correlated | 1 – Weakly correlated | 0 – Not correlated

Course Title: Animal Biotechnology

Course Outcomes (COs)

CO1. Describe the fundamentals of genetic engineering and recombinant DNA technology.

CO2. Explain the techniques and applications of PCR, blotting, and gene cloning.

CO3. Discuss the production and use of transgenic animals.

CO4. Analyze the use of biotechnology in animal health, reproduction, and conservation.

CO5. Assess ethical, legal, and social issues related to animal biotechnology.

CO-PO & CO-PSO Mapping Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	3	2	2	2	3	2	3	2	2	2
CO2	3	3	2	2	2	3	3	3	3	3	2
CO3	3	3	2	2	2	3	2	3	2	3	3
CO4	2	3	3	2	2	3	2	3	2	3	3

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO5	2	2	2	3	2	2	2	2	2	2	3

Legend:

3 – Strongly correlated | 2 – Moderately correlated | 1 – Weakly correlated | 0 – Not correlated

Course Title: Evolution and Zoogeography

Course Outcomes (COs)

CO1. Explain the fundamental concepts and theories of organic evolution.

CO2. Describe the mechanisms of evolution including mutation, natural selection, genetic drift, and speciation.

CO3. Interpret fossil records and their significance in understanding evolutionary history.

CO4. Identify and describe major zoogeographical realms and their characteristic fauna.

CO5. Analyze the role of evolution and geography in shaping global biodiversity.

CO-PO & CO-PSO Mapping Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	3	2	2	2	2	2	3	2	1	2
CO2	3	3	2	2	2	2	3	3	3	1	2
CO3	3	2	2	2	2	2	2	3	3	1	2
CO4	3	2	3	1	2	2	2	2	2	3	3
CO5	3	3	3	2	2	2	3	3	3	3	3

Legend:

3 – Strongly correlated | 2 – Moderately correlated | 1 – Weakly correlated | 0 – Not correlated

B.Sc Zoology - Semester IV

Course Title: Embryology

Course Outcomes (COs)

CO1. Describe gametogenesis, fertilization, and cleavage in various animal models.

CO2. Explain the process of gastrulation and formation of primary germ layers.

CO3. Illustrate the development of extra-embryonic membranes and placenta in mammals.

CO4. Identify organogenesis of selected systems such as neural, circulatory, and excretory

systems.

CO5. Discuss developmental anomalies and teratogenic effects in embryonic growth.

CO-PO & CO-PSO Mapping Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	3	2	2	2	2	2	3	2	2	2
CO2	3	3	2	1	2	2	2	3	3	2	2
CO3	3	2	2	2	2	2	2	3	3	2	2
CO4	3	3	2	2	2	3	2	2	3	2	3
CO5	2	3	2	3	2	2	3	2	2	2	3

Legend:

3 – Strongly correlated | 2 – Moderately correlated | 1 – Weakly correlated | 0 – Not correlated

Course Title: Animal Physiology: Life Sustaining Systems

Course Outcomes (COs):

CO1. Understand the structure and function of physiological systems (digestive, respiratory, circulatory, excretory, endocrine, and nervous) in vertebrates.

CO2. Explain the mechanisms underlying processes such as digestion, circulation, gas exchange, excretion, osmoregulation, hormonal regulation, and nerve impulses.

CO3. Analyze the physiological adaptations of animals in relation to environmental conditions and homeostasis.

CO4. Interpret experimental data related to animal physiology using basic laboratory techniques.

CO5. Develop skills in scientific reasoning, physiological experimentation, and interpretation of biological signals.

CO-PO and CO-PSO Mapping Matrix:

Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4
CO1. Structure-function of systems	3	2	-	-	2	-	3	2	2	-

Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4
CO2. Physiological mechanisms	3	3	-	-	2	-	3	2	3	-
CO3. Adaptations & homeostasis	2	3	2	-	3	-	3	2	3	2
CO4. Experimental data analysis	-	3	3	2	1	2	2	3	2	1
CO5. Scientific skills	1	3	3	3	2	3	2	3	2	2

Legend: 3 – Strongly related, 2 – Moderately related, 1 – Slightly related, - – Not related

Course Title: Immunology

Course Outcomes (COs):

CO1. Understand the components and organization of the immune system, including innate and adaptive immunity.

CO2. Describe the roles and mechanisms of action of various immune cells, organs, and molecules.

CO3. Explain antigen-antibody interactions, the complement system, and major histocompatibility complex (MHC).

CO4. Analyze immune responses in health and disease, including hypersensitivity, autoimmunity, immunodeficiency, and vaccination.

CO5. Apply immunological principles in laboratory settings and interpret immunodiagnostic tests.

CO-PO and CO-PSO Mapping Matrix:

Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4
CO1. Immune system organization	3	2	-	-	2	1	3	2	2	-
CO2. Roles of immune components	3	3	1	-	2	-	3	2	3	-
CO3. Antigen-antibody, MHC	3	3	1	-	2	-	3	2	3	-
CO4. Immune response & disease	2	3	3	1	3	2	2	2	3	2

Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4
CO5. Lab skills & immunodiagnosis	2	3	3	2	2	3	2	3	3	2

Legend: 3 – Strongly related, 2 – Moderately related, 1 – Slightly related, - – Not related

B.Sc. Zoology - Semester V

Course Title: Poultry Management I

Course Outcomes (COs):

CO1. Understand the basic principles of poultry farming, including types of poultry breeds and systems of rearing.

CO2. Acquire knowledge of poultry house design, sanitation, lighting, ventilation, and waste management.

CO3. Learn the nutritional requirements and feeding practices for broilers and layers at different growth stages.

CO4. Understand poultry health management, common diseases, vaccination, and biosecurity measures.

CO5. Develop basic entrepreneurial skills for starting and managing small to medium-scale poultry enterprises.

CO-PO and CO-PSO Mapping Matrix:

Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4
CO1. Principles & breeds	3	2	-	-	2	-	3	3	2	2
CO2. Poultry house & environment	3	2	-	-	3	1	3	3	2	2
CO3. Nutrition & feeding	3	3	-	-	2	2	3	3	2	2
CO4. Health & biosecurity	3	3	-	1	3	2	3	3	3	2
CO5. Entrepreneurship in poultry	2	2	2	2	2	3	2	2	3	3

Legend: 3 – Strongly related, 2 – Moderately related, 1 – Slightly related, - – Not related

Course Title: Poultry Management II

Course Outcomes (COs):

CO1. Understand the principles of hatchery management, including incubation, candling, and chick handling techniques.

CO2. Learn breeding techniques and genetic selection strategies for improving poultry stock.

CO3. Gain knowledge of poultry product processing, packaging, storage, and marketing strategies.

CO4. Understand economic aspects of poultry farming including budgeting, cost-benefit analysis, and record keeping.

CO5. Develop capacity for enterprise development and managing poultry-based agribusiness models.

CO-PO and CO-PSO Mapping Matrix:

Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4
CO1. Hatchery & chick management	3	2	-	1	2	1	3	3	2	2
CO2. Breeding & selection	3	3	1	-	2	-	3	3	2	2
CO3. Product processing & marketing	2	2	2	2	2	3	2	2	3	3
CO4. Poultry economics & records	2	3	3	2	2	3	2	2	3	3
CO5. Agribusiness development	2	3	3	2	2	3	2	2	3	3

Legend: 3 – Strongly related, 2 – Moderately related, 1 – Slightly related, - – Not related

Course Title: Livestock Management I (Biology of Dairy Animals)

Course Outcomes (COs):

CO1. Understand the anatomy and physiology of dairy animals including cattle and buffaloes.

CO2. Gain knowledge of breeds, breeding methods, and reproductive physiology of dairy animals.

CO3. Learn about the nutritional needs, feeding practices, and fodder management in dairy farming.

CO4. Understand lactation biology, milk production physiology, and milking techniques.

CO5. Apply concepts of animal welfare, hygiene, and disease prevention in dairy animal management.

CO-PO and CO-PSO Mapping Matrix:

Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4
CO1. Dairy anatomy & physiology	3	2	-	-	2	-	3	3	2	-
CO2. Breeds & reproduction	3	2	-	-	2	-	3	3	2	2
CO3. Nutrition & fodder	3	3	-	-	2	2	3	3	3	2
CO4. Lactation & milking	3	2	-	-	2	1	3	3	2	2
CO5. Welfare, hygiene & health	2	3	2	1	3	2	2	3	3	3

Legend: 3 – Strongly related, 2 – Moderately related, 1 – Slightly related, - – Not related

Course Title: Livestock Management II (Dairy Production and Management)

Course Outcomes (COs):

CO1. Understand principles of dairy farm management, including housing, sanitation, and record keeping.

CO2. Learn modern dairy technologies for milk production, collection, storage, and processing.

CO3. Gain insights into reproductive and lactation management to improve milk yield and animal health.

CO4. Understand health care practices, vaccination schedules, and disease control in dairy animals.

CO5. Develop skills for entrepreneurship in dairy farming and allied sectors.

CO-PO and CO-PSO Mapping Matrix:

Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4
CO1. Dairy farm practices & records	3	2	-	1	2	2	3	3	3	2
CO2. Milk production technologies	3	3	-	1	2	2	3	3	3	2
CO3. Reproduction & lactation mgmt.	3	2	-	-	2	1	3	3	2	2
CO4. Health care & disease prevention	3	3	1	1	3	2	3	3	3	2
CO5. Entrepreneurship in dairy farming	2	2	2	2	2	3	2	2	3	3

Legend: 3 – Strongly related, 2 – Moderately related, 1 – Slightly related, - – Not related

Course outcome Attainment**Course Outcome Attainment for *Animal Diversity-I: Biology of Non-Chordates***

- **Assessment Tools**
- **Attainment Levels**
- **Course Outcome Calculation**
- **Overall CO Attainment Format**

1. Assessment Tools

Assessment Method	Description	Weightage (%)
Internal Assessment	Assignments, quizzes, viva, short tests	20%
Mid-Semester Exam	Theory-based assessment	20%
End Semester Exam	Comprehensive university exam	50%
Practical/Project Work	Hands-on performance, dairy farm project report	10%

2. Attainment Levels

Level	Description	Performance Range (in %)
3	High Attainment: $\geq 70\%$ of students score $\geq 60\%$ marks	$\geq 70\%$

Level	Description	Performance Range (in %)
2	Moderate Attainment: 50–69% of students score $\geq 60\%$ marks	50–69%
1	Low Attainment: $< 50\%$ of students score $\geq 60\%$ marks	$< 50\%$

3. Course Outcome Attainment Calculation

CO Attainment = (Direct Assessment Average \times 0.8)+(Indirect Assessment \times 0.2)

Direct Assessment: Based on student performance in relevant questions/tasks mapped to each CO.

Indirect Assessment: Student feedback/survey on understanding and relevance of COs.

4. Sample CO-wise Attainment Table


CO No	Internal Test Avg (%)	End Sem Avg (%)	Weighted Avg	% of Students $\geq 60\%$	Attainment Level
CO1	65	70	68	75%	3
CO2	60	66	63	65%	2
CO3	58	62	60	60%	2
CO4	70	75	73	80%	3
CO5	55	60	58	50%	2

5. Overall CO Attainment Summary

Course Attainment = \sum (Attainment Level of each CO) / Number of COs

Example:

Course Attainment = $3+2+2+3+2 / 5 = 2.4 \Rightarrow$ Moderate to High Attainment


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