Department of Zoology

Nesamony Memorial Christian College, Marthandam

# M. Sc. Zoology

## Course Outcome

| Semester – I M. Sc. Zoology | | | | | |
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| **Part** | **Course Name** | **Course Code** | **Credit** | **Hours** | **Course Outcome** |
| Part - A | Core Course – I: **Structure and Function of Invertebrates** | VZOC11 | 5 | 7 | On the successful completion of the course, student will be able to:<br>**CO1** Remember the general concepts and major groups in animal classification, origin, structure, functions and distribution of life in all its forms.<br>**CO2** Understand the evolutionary process. All are linked in a sequence of life patterns.<br>**CO3** Apply this for pre-professional work In agriculture and conservation of life forms.<br>**CO4** Analyze what lies beyond our present knowledge of life process.<br>**CO5** Evaluate and to create the perfect phylogenetic relationship in classification. |
| | Core Course - II: **Comparative Anatomy of Vertebrates** | VZOC12 | 5 | 7 | On the successful completion of the course, student will be able to:<br>**CO1** Remember the general concepts and major groups in animal classification, origin, structure, functions and distribution of life in all its forms.<br>**CO2** Understand the evolutionary process. All are linked in a sequence of life patterns.<br>**CO3** Apply this for pre-professional work in agriculture and conservation of life forms.<br>**CO4** Analyze what lies beyond our present knowledge of life process.<br>**CO5** Evaluate and to create the perfect phylogenetic relationship in classification. |
| | Core Course - III: **Lab Course in Invertebrates & Lab Course in Vertebrates** | VZOL11 | 4 | 6 | On the successful completion of the course, student will be able to:<br>**CO1** Understand the structure and functions of various systems in animals<br>**CO2** Learn the adaptive features of different groups of animals<br>**CO3** Learn the mounting techniques<br>**CO4** Acquire strong knowledge on the animal skeletal system |
| | Elective - I: **Biochemistry** | VZOE11 | 3 | 5 | On the successful completion of the course, student will be able to:<br>**CO1** Learn the structure, properties, metabolism, and bioenergetics of biomolecules<br>**CO2** Acquire knowledge on various classes and major types of enzymes, classification, their mechanism of action and regulation |

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| | | | | | **CO3** Understand the fundamentals of biophysical chemistry and biochemistry, importance, and applications of methods in conforming the structure of biopolymers<br>**CO4** Comprehend the structural organization of and proteins, carbohydrates, nucleic acids and lipids<br>**CO5** Familiarize the use of methods for the identification, characterization, and conformation of biopolymer structures. |
| | Elective - II:<br>**Sericulture** | VZOE14 | 3 | 5 | Upon completion of this course, Students would have<br>**CO1** To understand the various practices in sericulture. To know the needs for sericulture and the status of India in global market.<br>**CO2** Able to apply the techniques and practices needed for sericulture.<br>**CO3** To know the difficulties in sericulture and be able to propose plans against it. |
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| **Semester – II M. Sc. Zoology** | | | | | |
| Part - A | Core Course – IV:<br>**Cellular and Molecular Biology** | VZOC21 | 5 | 6 | Upon completion of this course, students could<br>**CO1** Understand the general concepts of cell and molecular biology.<br>**CO2** Visualize the basic molecular processes in prokaryotic and eukaryotic cells, especially relevance of molecular and cellular structures influencing functional features.<br>**CO3** Perceive the importance of physical and chemical signals at the molecular level resulting in modulation of response of cellular responses.<br>**CO4** Updated the knowledge on the rapid advances in cell and molecular biology for a better understanding of onset of various diseases including cancer.<br>**CO5** Understand the general concepts of cell and molecular biology. |
| | Core Course - V:<br>**Developmental Biology** | VZOC22 | 5 | 6 | On the successful completion of the course, student will be able to<br>**CO1** Define the concepts of embryonic development<br>**CO2** Observe various stages of cell divisions under microscope<br>**CO3** Understand the formation of zygote<br>**CO4** Differentiate the blastula and gastrula stages<br>**CO5** Learn the distinguishing features of three different germ layers and formation of various tissues and organs |
| | Core Course - VI:<br>**Lab Course in Cell Biology & Lab Course in** | VZOL21 | | | Upon completion of this lab course, students<br>**CO1** Acquire knowledge to differentiate the cells of various living organisms and become awares of physiological processes of cells e.g. cell divisions, various stages of fertilization and embryo development. |

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| | **Developmental Biology** | | | | **CO2** Understand and observe as well as correctly identify different cell types, cellular structures using different microscopic techniques.<br>**CO3** Develop handling - skills through the wet-lab course.<br>**CO4** Learn the method of culturing of Drosophila and identification of their wild and mutant strains<br>**CO5** Acquire skills to perform human karyotyping and chromosome mapping to identify abnormalities |
| | Elective - III: **Biostatistics** | VZOE21 | 3 | 4 | Upon completion of this course, Students would have<br>**CO1** Clear understanding of design and application of biostatistics relevant to experimental and population studies.<br>**CO2** Acquired skills to perform various statistical analyses using modern statistical techniques and software.<br>**CO3** Knowledge on the merits and limitation of practical problems in biological/ health management study as well as to propose and implement appropriate statistical design/ methods of analysis. |
| | Elective - IV: **Research Methodology** | VZOE23 | 3 | 4 | On the successful completion of the course, student will be able to<br>**CO1** Understand the implications of GLP<br>**CO2** Learn the working principles of different instruments<br>**CO3** Gain the knowledge on techniques of histology and histochemistry<br>**CO4** Acquire knowledge on the basic principle and application of various modules of light and electron microscopy |
| | SEC - I: **Poultry Farming** | VZOSE21 | 2 | 4 | Upon completion of this course, Students would have<br>**CO1** To understand the various practices in Poultry farming. To know the needs for Poultry farming and the status of India in global market.<br>**CO2** To be able to apply the techniques and practices needed or Poultry farming.<br>**CO3** To know the difficulties in Poultry farming and be able to propose plans against it |
| **Semester – III M. Sc. Zoology** | | | | | |
| Part - A | Core Course –VII: **Genetics and Evolution** | WZOM31 | 5 | 6 | On the successful completion of the course, student will be able to<br>**CO1** Explain the different principles of inheritance<br>**CO2** Explicate the structures and functions of chromosomes and identify the diseases caused by the chromosomal abnormalities.<br>**CO3** Apply the concepts and rate of change in gene frequency through natural selection, migration and random genetic drift<br>**CO4** Comprehend the concepts of variation and adaptation<br>**CO5** Evaluate the process of evolution of higher taxa |
| | Core Course -VIII: **Animal** | WZOM32 | 5 | 6 | On the successful completion of the course, student will be able to<br>**CO1** Understand the functions of different systems of animals |

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| | **Physiology** | | | | **CO2** Learn the anatomy of heart structure and functions, blood composition, regulation<br>**CO3** Know the transport and exchange of gases, neural and chemical regulation of respiration and function of excretory System<br>**CO4** Acquire knowledge on the organization and structure of central and peripheral nervous systems<br>**CO5** Evaluate the role and mechanism of hormones |
| | Core Course -IX: **Lab in Genetics & Evolution and Animal Physiology** | WZOL31 | 5 | 6 | On the successful completion of the course, student will be able to<br>**CO1** Acquire knowledge in proving the laws in genetics<br>**CO2** Understand the genetic traits in man<br>**CO3** Apply the practical methods to verify Hardy Weinberg law.<br>**CO4** Study the evolutionary significance of fossils.<br>**CO5** Learn the process of salivary amylase activity in relation to temperature |
| | Core Course –X (Industry Module): **Medical Laboratory Techniques** | WZOM33 | 4 | 4 | Upon completion of this course, Students would have<br>**CO1** Understand protocols and procedures to collect clinical samples for blood analysis and to study human physiology.<br>**CO2** Explain the characteristics of composition of blood and their function.<br>**CO3** Evaluate the usage of the various instruments in clinical diagnosis.<br>**CO4** Analyze the Procedures involved in Diagnostic Techniques<br>**CO5** Evaluate the histological parameters of biological samples. |
| | Elective - V: **Applied Microbiology** | WZOE32 | 3 | 4 | Upon completion of this course, Students would have<br>**CO1** Relate the basic understanding on taxonomical classification of microbes<br>**CO2** Pursuing high skills and knowledge on bacterial isolation, Sterilization and Preservation<br>**CO3** Analyse the nutritional requirements, common microbial flora in Food<br>**CO4** Evaluate microbiological role in the manufacture of industrial products; solve environmental problems.<br>**CO5** Impart the knowledge of clinically important human diseases with respect to their causative agent. |
| Part - B | SEC - II: **Dairy Farming** | WZOSE31 | 2 | 4 | Upon completion of this course, Students would have<br>**CO1** To understand the various practices in Dairy farming. To know the needs for Dairy farming and the status of India in global market.<br>**CO2** To be able to apply the techniques and practices needed for Dairy farming.<br>**CO3** To gain knowledge on feed additives and to apply it in feed management in Dairy farming.<br>**CO4** Understand about Milk and its products. To apply different techniques to protect milk products from getting spoiled.<br>**CO5** Explain the methods to protect cattle from diseases and the medicines to be given if they are infected |

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| | Internship / Industrial Activity/ Field visit/ Research Knowledge updation Activity | | 2 | | |
| **Semester – IV M. Sc. Zoology** | | | | | |
| Part - A | Core Course –XI: **Immunology** | WZOM41 | 5 | 6 | Students would have acquired clear knowledge on<br>**CO1** Various basic concepts in immunology and organization of immune systems.<br>**CO2** Understanding immunogenicity, vaccines<br>**CO3** Mechanisms of immune response in health and their defects in various diseases.<br>**CO4** The application of immunological principles in biomedical sciences including blood transfusion, tissue grafting and organ transplantation.<br>**CO5** Vaccinology and its importance in disease management |
| | Core Course -XII: **Ecology** | WZOM42 | 5 | 6 | On the successful completion of the course, student will be able to<br>**CO1** Learn about the ecosystem, biotic communities and utilizing the energy processing<br>**CO2** Study the various community and population and population control<br>**CO3** Understand species interaction and ecological succession.<br>**CO4** Analyse the different types of ecosystems and their energy flow.<br>**CO5** Realizing the nature of pollution and the ways for its control/ reduction. Impact of environmental studies on solid waste management |
| | Core Course -XIII: **Lab course in Immunology Ecology** | WZOL41 | 3 | 4 | On the successful completion of the course, student will be able to<br>**CO1** Acquire ability to perform/demonstrate various basic concepts of immunology<br>**CO2** Understand the structure and to identify WBC.<br>**CO3** Perform expts to measure primary productivity<br>**CO4** Analyse the marine and freshwater planktons<br>**CO5** Evaluate the content of different water samples |
| | **Project with Viva Voce** | WZOP41 | 4 | 6 | |
| | Elective - VI: **Aquaculture** | WZOE41 | 3 | 4 | Upon completion of this course, Students would have<br>**CO1** To develop knowledge on the fish farm and their maintenance.<br>**CO2** Understand the methods of fish seed and feed production and develops knowledge on hatchery |

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| | | | | | techniques<br>**CO3** To apply the knowledge about different culture methods in aquaculture and gain knowledge on fish and shrimp breeding techniques and larval culture<br>**CO4** Identify the different fishes diseases, diagnosis and their management strategies.<br>**CO5** Understand the biology of freshwater and marine Ornamental fishes and activities of central aquaculture organizations |
| Part - B | SEC - III: **Animal Behaviour** | WZOSE41 | 2 | 4 | Upon completion of this course, Students would have<br>**CO1** Recall and record genetic basis and evolutionary history of behaviour.<br>**CO2** Analyze and identify innate, learned and cognitive behaviour<br>**CO3** Evaluate the behaviour of Animals in changing environments<br>**CO4** Classify movement and migration behaviours<br>**CO5** Understanding circadian system and Chrono pharmacology |
| Part - C | Extension Activity Services | | 1 | | |