



Shri Yogeshwari Education Society's
Yogeshwari Mahavidyalaya Ambajogai



Department of Zoology

Programme Outcomes: B. Sc. Zoology

Department of Zoology	After successful completion of three year degree program in Zoology a student should be able to;
Programme Outcomes	<p>PO-1. The program helps to develop scientific tempers and attitudes, which in turn can prove to be beneficial for the society since the scientific developments can make a nation or society to grow at a rapid pace.</p> <p>PO-2. Students will be more equipped to learn and know about different biological systems, their coordination and control as well as evolution, behavior and biological roles of the animals in the ecosystem.</p> <p>PO-3. They will be able to qualitatively and quantitatively analyse evolutionary parameters using various bioinformatics and computational tools used in modern sciences.</p> <p>PO-4. This will provide them ample opportunities to explore different career avenues.</p> <p>PO-5. The program will also provide a platform for classical genetics in order to understand distribution or inheritance of different traits and diseases among populations, their ethnicity and correlate with contemporary and modern techniques like genomics, metagenomics, genome editing and molecular diagnostic tools.</p> <p>PO-6. After the completion of this course, students have the option to go for higher studies, i.e., M. Sc. / Integrated Ph.D. and then do research work for the welfare of mankind.</p> <p>PO-7. After higher studies, students can join as scientist or assistant professor or assistant teacher and can even look for professional job oriented courses, such as Indian Civil Services, Indian Forest Service, Indian Police Service.</p> <p>PO-8. Science graduates can go to serve in industries or may opt for establishing their own industrial unit.</p> <p>PO-9. Practical and theoretical skills gained in this program will be helpful in designing different public health strategies for social welfare.</p> <p>PO-10. The program has been designed to provide in-depth knowledge of applied subjects ensuring the inculcation of employment skills so that students can make a career and become an entrepreneur in diverse fields.</p>

	<p>PO-11. After the completion of the B.Sc degree there are various other options available for the science students.</p>
<p>Programme Specific Outcomes</p>	<p>PSO-1. Gain the knowledge of Zoology through theory and practical's.</p> <p>PSO-2. Students enrolled in B.Sc. degree program in Zoology will study and acquire complete knowledge of disciplinary as well as allied biological sciences.</p> <p>PSO-3. They are likely to possess expertise which will provide them competitive advantage in pursuing higher studies from India or abroad; and seek jobs in academia, research or industries.</p> <p>PSO-4. Students will be able to define and explain major concepts in the biological sciences.</p> <p>PSO-5. They are able to correctly use biological instrumentation and proper laboratory techniques.</p> <p>PSO-6. Students will be able to communicate biological knowledge in oral and written form.</p> <p>PSO-7. Students will be able to identify the relationship or synchronization between structure and function at all levels: molecular, cellular, and organismal. Students should be able to identify, classify and differentiate diverse chordates and nonchordates based on their morphological, anatomical and systemic organization.</p> <p>PSO-8. They will be able to describe economic, ecological and medical significance of various animals in human life. This will create a curiosity and awareness among them to explore the animal diversity and take up wild life photography or wild life exploration as a career option.</p> <p>PSO-9. The procedural knowledge about identifying and classifying animals will provide students professional advantages in teaching, research and taxonomist jobs in various government organizations; including Zoological Survey of India and National Parks/Sanctuaries.</p> <p>PSO-10. Students will be able to apply the scientific method to questions in biology by formulating testable hypotheses, gathering data that address these hypotheses, and analysing those data to assess the degree to which their scientific work supports their hypotheses.</p> <p>PSO-11. Students will be able to present scientific hypotheses and data both orally and in writing in the formats that are used by practicing scientists.</p> <p>PSO-12. Students will be able to access the primary literature, identify relevant works for a particular topic, and evaluate the scientific content of these works.</p>

Course Outcomes B.Sc.: Zoology

B.Sc. First Year

Course Details	Outcomes of the course: On successful completion of the course, Students will be able to,
Paper-I (ZOL-101) Protozoa to Annelida	<ul style="list-style-type: none"> ➤ General characters and classification of Protozoa, porifera, Helminthes, Annelida. ➤ Structure and reproduction of Paramoecium, Plasmodium, Sycon, Obelia, Ascaris, Leech ➤ life cycle of Plasmodium, Obelia, Ascaris, Taenia solium. ➤ Parasitic Protozoans of Man- Mode of infection and its control, parasitic adaptations in helminthes. <p>Canal system in sponges, corals and coral reef formation, Vermiculture and its importance.</p>
Paper-II (ZOL-102) Cell Biology	<ul style="list-style-type: none"> ➤ Ultra structure of prokaryotic and eukaryotic cell , ➤ structure and function of Cell organelles. ➤ Oxidative phosphorylation, Glycolysis and Krebs's cycle & Electron Transport Chain and ➤ terminal oxidation. ➤ Giant chromosomes: Lamp-brush and polytene chromosome ➤ Cell cycle and Mitosis ,Meiosis (different phases and significance), <p>Cellular ageing and cell death, Elementary idea of cancer and its causative agents.</p>
Paper-V (ZOL-201) Arthropoda to Echinodermata & Protochordata	<ul style="list-style-type: none"> • Create the awareness of the economic importance and significance of arthropods and molluscs • Identify and appreciate the unique characters of different arthropods, molluscs and echinoderms • Explain the diversity of higher invertebrates • To appreciate the diversity in higher invertebrates including arthropods, molluscs and echinoderms
Paper-VI (ZOL-202) Genetics-I	<ul style="list-style-type: none"> ➤ Mendelian Principles & laws. ➤ Interaction of genes, quantitative genetics & extra nuclear genome. ➤ Cytoplasmic inheritance, Linkage and crossing over.

B.Sc. Second Year

Course Details	Outcomes of the course
<p>Paper-IX (ZOL-301)</p> <p>Vertebrate Zoology</p>	<p>On successful completion of the course, Students will be able to,</p> <ul style="list-style-type: none"> ➤ Identify, classify and distinguish the characters and adaptive features of animals from: <ul style="list-style-type: none"> • Reptilia, Aves & Mammals. • understand poison apparatus, biting mechanism, snake venom and its importance. • understand Comparison of Ratitae and Caranitae, Flight adaptations and migration. • understand Adaptations in animals. • understand Races in Man • understand embyology of Mammals & chick understand Biological clock : Diurnal and rhythmic behavior in birds and mammals.
<p>Paper-X (ZOL-302)</p> <p>Genetics-II</p>	<ul style="list-style-type: none"> ➤ Concepts of genes & Genetic disorders in human. ➤ Sex determination. ➤ Gene mutations & Lethal genes. ➤ population genetics, Genetic counseling & Applied genetics
<p>Paper-XIII (ZOL-401)</p> <p>Animal Physiology</p>	<ul style="list-style-type: none"> ➤ Importance of vitamins & Enzymes-biocatalyst, ➤ Glands and hormones associated with digestion. ➤ explain the physiology of digestion, respiration, circulation ➤ Blood pressure, E.C.G. & working of Heart. ➤ Composition of blood, respiratory pigments in mammals.
<p>Paper-XIV (ZOL-402)</p> <p>Biochemistry and Endocrinology</p>	<ul style="list-style-type: none"> ➤ To understand the importance of metabolism of substrates. ➤ Will acquire chemistry and biological importance of biological macromolecules. ➤ To acquire knowledge in qualitative and quantitative estimation of the biological macromolecules. ➤ To know the interpretation of data emanating from a Clinical Test Lab. ➤ To know how physiological conditions influence the structures and re -activities of biomolecules. ➤ Demonstrate/illustrate how the homeostatic model applies to every endocrine system in normal physiology and disease ➤ Demonstrate/illustrate how every aspect of our physiology and behaviour is directly controlled or modified by hormones using reproduction, growth, development, stress, and metabolism as

	<p>examples.</p> <ul style="list-style-type: none"> ➤ Demonstrate/illustrate that the same biochemical and cellular processes of chemical communication are involved in endocrinology as they are in any other biological systems; i.e., all chemical communicators (hormones, neurocrines, cytochromes, etc.) work in essentially the same manner ➤ Demonstrate/illustrate the concept of cross talk between physiological systems and within target cells between signalling pathways; i.e., how many hormones affect the secretion and actions of other hormones. ➤ 5. Demonstrate/illustrate how endocrine systems can be disrupted with respect to synthesis, secretion, transport, receptors, mechanisms of action, and metabolism/excretion.
<u>B.Sc. Third Year</u>	
Course Details	Outcomes of the course
	On successful completion of the course, Students will be able to,
Paper-XVII (ZOL-501) Ecology	<ul style="list-style-type: none"> ➤ Describe the structure and function of ecological systems and explain how ecological systems work at different spatial and temporal scales ➤ List abiotic and biotic factors that affect, the distribution, dispersal, and behavior of organisms ➤ Identify factors that affect biological diversity and the functioning of ecological systems in Wisconsin. ➤ Use an ecological vocabulary in arguments and explanations of ecological phenomena ➤ Apply concepts and theories from biology to ecological examples. ➤ Analyze and interpret ecological information, research and data
Paper-XVIII (ZOL-502) Fishery Sciences-I	<ul style="list-style-type: none"> ➤ The basic concept of Aquaculture their uses ➤ To impart knowledge about fish nutrition, methods of determining the food of fishes. ➤ The students will gain knowledge of fish farming with Agriculture: rice cum fish culture and culturable species in rice fields, rotational and simultaneous culture. ➤ The students will gain knowledge Sewage fed fisheries, culture of air breathing fishes. ➤ The students will gain knowledge cold water fisheries, fish farm Management, Brood stock and hatchery management.
	<ul style="list-style-type: none"> ➤ describing the meaning of microevolution and its significance to modern evolutionary theory.

<p>Paper-XXI (ZOL-601)</p> <p>Evolution</p>	<ul style="list-style-type: none"> ➤ identifying the mechanisms that bring about changes in the allele frequencies of POPulations (mutation, genetic drift, gene flow, non-random mating and naturalselection) and evaluating their relative significance. ➤ explaining how the various mechanisms of microevolution function to bring about change in the allele frequencies of POPulations.
<p>Paper-XXII (ZOL-602)</p> <p>Fishery Sciences-II</p>	<ul style="list-style-type: none"> ➤ The students will learn about breeding of ornamental fishes. ➤ The students will learn about fish Seed resources and their transport. ➤ The students will learn about nutritional value of feed ingredients and live feed, ImPORTance of natural food.



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Department of Zoology

Programme Outcomes: (M. Sc. Zoology)

Department of Zoology	After successful completion of two year degree program in Zoology a student should be able to;
Programme Outcomes	<p>PO-1.The programme also works across related majors within the M.Sc zoology.</p> <p>PO-2.Distinguish between the Structure, Function, Behaviour and evolution of different animals .</p> <p>PO-3.For instance if you major in zoology, you can also still take courses from across the other complementary.</p> <p>PO-4.Master of Science majors of conservation biology and ecology, giving you an in-depth knowledge of those most closely related programmes.</p> <p>PO-5.Apply the wide range of subject based skills to various fields that provide a base for future career in disciplines such as Health Sciences, Agriculture, Environmental Management, Biotechnology, Publishing, Teaching and Research.</p> <p>PO-6.Perform, Assess and implement practical techniques and procedure to solve biological problems and analyse and quantify data collected during any project.</p> <p>PO-7.Understand the applications of Biological techniques to various fields of biology.</p> <p>PO-8.When you graduate with a Master of Science (Zoology) you will have learned how to work at a high level of academic achievement.</p> <p>PO-9.Work to deadlines under pressure and communicate effectively.</p>
	<p>PO-1. Understand Nature, environment natural resources and their conservation, Classification & Behaviour of different animals, Human genetics, Cytology and Evolution.</p>

Programme Specific Outcomes	<p>PO-2. Apply the wide range of subject based skills to various fields that provide a base for future career in disciplines such as Health Sciences, Agriculture, Environmental Management, Biotechnology, Publishing ,Teaching and Research.</p> <p>PO-3. Distinguish between the Structure, Function, Behaviour and evolution of different animals.</p> <p>PO-4. Perform, Assess and implement practical techniques and procedure to solve biological problems and analyse and quantify data collected during any project.</p> <p>PO-5. Understand the applications of Biological techniques to various fields of biology.</p>
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Course Outcomes M.Sc. Zoology

Course Details	Outcomes of the Course
ZOO-101 Biosystematics & Animal Diversity	<p>After completion of these courses students should be able to;</p> <p>CO-1. Classify animals on the basis of their relation to other animals by body structure,external characters, development and DNA.</p> <p>CO-2. Apply the International rules of Nomenclature to give a scientific name to animals which are found during research.</p> <p>CO-3. Understand the gradual development and evolutionary history of different kinds of living organisms from earlier forms over several generations.</p> <p>CO-4. Understand and demonstrate the internal anatomy of various animals,biodiversity and related indices.</p>
ZOO-102 Biochemistry	<p>CO-1. Understand the significance of Biochemistry</p> <p>CO-2. Describe the chemistry of carbohydrates, lipids, proteins and amino acids.</p> <p>CO-3. Describe the classification and structural organization of proteins.</p> <p>CO-4.Describe the mechanism of enzyme action and identify the classes of enzymes and factors affecting action.</p> <p>CO-5. Describe the catabolic reactions of carbohydrates, lipids and amino</p>

	<p>acids.</p> <p>CO-6. Identify the class and functions of secondary metabolites.</p>
<p>ZOO-103</p> <p>Ecology: Principles & Practices</p>	<p>CO-1. Students will be understanding the various features and aspects of POpulation ecology, community ecology and ecosystem ecology.</p> <p>CO-2. They might have the knowledge about environmental biology in details.</p> <p>CO-3. They will acquire knowledge about various tools and techniques of field ecology.</p> <p>CO-4. Critically analyze technical subject matter (written or oral) for scientific merit apply learned environmental knowledge and understanding to solve technical /research problems in new contexts.</p>
<p>ZOO-104</p> <p>Research Methodology</p>	<p>CO-1.Applying various methods for collecting primary and secondary data.</p> <p>CO-2.Modeling, developing hyPOthesis and devising new algorithms.</p> <p>CO-3.Drawing inferences from data analysis.</p> <p>CO-4. Thesis writing & RePOrt writing.</p> <p>CO-5.Application of computing skills and computer applications in research.</p> <p>CO-6. In-depth knowledge of the subject chosen for research.</p>
<p>ZOO-106</p> <p>Protozoology-I</p>	<p>CO-1. To familiarise yourself with morphologic criteria to differentiate the most common protozoan .</p> <p>CO-2. To improve your diagnostic skills by solving basic and advanced diagnostic exercises using a virtual microscope</p> <p>CO-3. To get an overview of diagnostic strategies and to apply or adapt these to specific diagnostic questions</p> <p>CO-4. To get an overview of alternative methods to microscopy (mainly molecular and immunological methods)</p> <p>CO-5. To gain experience with diagnostic keys and assistance in choosing appropriate keys (from textbooks or WHO documents) for your own work</p> <p>CO-6. To understand the basics of diagnostics by optimising diagnostic strategies (e.g. by minimising false POsitives or false negatives) taking into account the specific diagnostic goal, the consequence of the diagnostic result for the patient and the concepts of predictive</p>

	values.
ZOO-201 Genetics & Bioinformatics	<p>CO -1. To get an in-depth understanding on the principles and mechanisms of inheritance.</p> <p>CO-2. To analyse the fine structure and molecular aspects of genetic material.</p> <p>CO-3. To understand the imPOrtance of inheritance in Man and congenital diseases.</p> <p>CO-4. To get acquainted with the field of bioinformatics and able to take up bioinformatics studies.</p>
ZOO-202 Cell & Molecular Biology	<p>CO-1. Understand the structural and functional details of the basic unit of life at the molecular level.</p> <p>CO-2. Understand and explain the basics of cell biology.</p> <p>CO-3. Explain the new developments in molecular biology and its implications in human welfare.</p>
ZOO-203 Biophysics	<p>CO-1. Understand the biophysical properties and functioning of life processes.</p> <p>CO-2. Have an idea of the different tools and techniques available for studying biochemical and biophysical nature of life.</p> <p>CO-3. Use the tools and techniques for project work/ research in biology.</p>
ZOO-204 Instrumentation & Biological Techniques	<p>CO-1. Understand the biophysical properties and functioning of life process.</p> <p>CO-2. Have an idea of the different tools and techniques available for studying biochemical and biophysical nature of life.</p> <p>CO-3. Use the tools and techniques for project work/ research in biology.</p>
ZOO-206 Protozoology-II	<p>CO-1. Impart advance knowledge on various imPOrtant protozoan parasites.</p> <p>CO-2. Give understanding about host parasite relationship and control measure.</p> <p>CO-3. To familiarise yourself with morphologic criteria to differentiate the most common protozoan and parasites.</p> <p>CO-4. To get an overview of diagnostic strategies and to apply or adapt these to specific diagnostic questions.</p>
	CO-1. To understand the developmental process that lead to establishment of body plan of vertebrates and the corresPOnDing cellular and genetic mechanisms.

<p>ZOO-301 Developmental Biology</p>	<p>CO-2. Attain a basic conceptual knowledge about the principal cellular mechanisms of development.</p> <p>CO-3. To explain the clinical implications of development and the mechanisms intervene in the developmental alterations.</p> <p>CO-4. To exPOse the learner to the new developments in embryology and its relevance to man.</p>
<p>ZOO-302 Immunology</p>	<p>CO-1. To POssess an in depth knowledge and new developments in immunology.</p> <p>CO-2. To describe the organisation and functioning of the immune system.</p> <p>CO-3. To give a detailed description of diagnostic tests of diseases.</p> <p>CO-4. To understand different types of vaccines and their role in human health and well being.</p>
<p>ZOO-303 Applied Biotechnology-I</p>	<p>CO-1. Demonstrate professional and scientific communication appropriate for biotechnology settings.</p> <p>CO-2. Demonstrate comprehensive understanding of organizational processes and product development pipelines.Distinguish among diverse methods and technologies and their applications in biotechnology.</p> <p>CO-3. Demonstrate strategic leadership and decision-making skills necessary in biotechnology.</p> <p>CO-4. Appraise the current regulatory, quality control, and legal frameworks that impact biotechnology.</p> <p>CO-5. Demonstrate professional and ethical behaviors that foster POsitive and productive interactions in diverse biotechnology settings.</p>
<p>ZOO-304 Biostatistics</p>	<p>CO-1. To understand the concepts of statistics and research methodology and create awareness about the gadgets, tools and accessories of biological research.</p> <p>CO-2. Help students to improve analytical and critical thinking skills through personal problem solving.</p> <p>CO-3. To enable learners to effectively apply suitable statistical tests in research and equip them to prepare research papers and project proPOSals.</p> <p>CO-4. To sensitize students about the ethics involved in research and enable</p>

	them to come up with innovative research designs.
ZOO-5308 Pisciculture	<p>CO-1. The students will gain knowledge of fish farming with Agriculture: rice cum fish culture and culturable species in rice fields, rotational and simultaneous culture.</p> <p>CO-2. The students will gain knowledge Sewage fed fisheries, culture of air breathing fishes.</p> <p>CO-3. The students will gain knowledge cold water fisheries, fish farm Management ,Brood stock and hatchery management.</p>
ZOO-313 Fishery Science-I	<p>CO-1. The basic concept of Aquaculture their uses</p> <p>CO-2. To impart knowledge about fish nutrition, methods of determining the food of fishes.</p> <p>CO-3. The students will gain knowledge of fish farming with Agriculture: rice cum fish culture and culturable species in rice fields, rotational and simultaneous culture.</p>
ZOO-401 Evolution &Behaviour	<p>CO-1. By biological evolution we could understand that many of the organisms that inhabit theEarth today are different from those that inhabited it in the past</p> <p>CO-2. Understood that the four proPOsitions underlying Darwin's theory of evolution throughnatural selection are: (1) more individuals are produced than can survive; (2) There is therefore, a struggle for existence (3) Individuals within a species show variation (4) Offspring tend to inherit their parental characters</p> <p>CO-3.Explained adaptation, providing examples from several different fields of biology</p> <p>CO-4. Explained how the molecular record provides evidence for evolution.</p> <p>CO-5. Understood the Human origin and evolution.</p>
ZOO-402 General & Comparative Physiology	<p>CO-1.Understand imPOrtant physiological challenges animals face, how those challenges vary in relation to the animals' environment, and the processes by which animals deal with these challenges.</p> <p>CO-2. Identify and describe structural differences of major physiological systems that characterize different taxonomic groups of animals.</p> <p>CO-3.Relate physiological processes, from the biochemical to the system level, to the function of the entire organism in its environment.</p> <p>CO-4. Develop an understanding of current research topics in animal</p>

	physiology using the primary literature and to develop research questions and methodology to address these questions.
ZOO-403 Animal Biotechnology	<p>CO-1. Describe the limitations and challenges facing the animal industries and disciplines.</p> <p>CO-2. Describe the biotechnologies available for application in industries or disciplines that involve animals.</p> <p>CO-3. Explain the POTential applications of current or developing biotechnologies to these animal related fields.</p> <p>CO-4. Evaluate and discuss public and ethical concerns over the use of animal biotechnology.</p> <p>CO-5. Locate and critically evaluate scientific literature and experimental studies relating to animal biotechnology and be able to effectively communicate the findings in oral and written form.</p>
ZOO-408 Fishery Science-II	<p>CO-1. The basic concept of Aquaculture their uses.</p> <p>CO-2. To impart knowledge about fish nutrition, methods of determining the food of fishes.</p> <p>CO-3. The students will gain knowledge of fish farming with Agriculture: rice cum fish culture and culturable species in rice fields, rotational and simultaneous culture.</p> <p>CO-4. The students will gain knowledge Sewage fed fisheries, culture of air breathing fishes.</p> <p>CO-5. The students will gain knowledge cold water fisheries, fish farm Management ,Brood stock and hatchery management.</p>


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