

B.SC. HONOURS IN ZOOLOGY
PROGRAMME SPECIFIC OUTCOME

The syllabus for Zoology Honours at undergraduate level using the Choice based Credit system has been framed in compliance with model syllabus given by UGC. The main objective of framing this new syllabus is to give the students a holistic understanding of the subject giving substantial weightage to both the core contents and techniques used in Zoology. Keeping in mind and in tune with the changing nature of the subject, adequate emphasis has been given on new techniques and understanding of the subject.

HONOURS COURSE OUTCOME

SEMESTER	COURSE CODE	COURSE TITLE	COURSE OUTCOME
I	CC 1	NONCHORDATE I	Students will be able to understand the fundamental principles of systematic in which the Protist, Porifera, Cnidaria, Ctenophora, Platyhelminthes and Nemathalminthes are classified according to their characters up to class. → Life cycle and pathogenicity of <i>Plasmodium vivax</i> , <i>Entamoeba histolytica</i> , <i>Fasciola hepatica</i> , <i>Taenia solium</i> , <i>Ascaris lumbricoides</i> and <i>Wuchereria bancrofti</i> are studied here. Students will also gain knowledge on origin, evolution and significance of parasitism, specialized organs, symmetry and segmentation of non-chordates. In lab course they will study prepare whole mount of <i>Euglena</i> , <i>Amoeba</i> , <i>Paramoecium</i> , identification of various

			non-chordate marine species as well as some helminth parasites and staining and mouting of parasitic protozoa/helminth from gut of cockroach.
I	CC2	ECOLOGY	Students will be able to learn in details about population ecology, community ecology and ecosystem ecology. → The students will be able to link the intricacies of food chains, food webs, nutrient cycle and flow of energy through the ecosystem. This course will enable the students to comprehend and analyze the practical aspects of ecological parameters by using Shannon-Weiner index, Winkler's method, fecundity tables, survivorship curve and soon. → The learner will also be able to understand and appreciates the diversity of ecosystems and its role and significance in Wildlife Conservation and Management. The inclusion of National Park/Biodiversity Park/Wild Life Sanctuary visit in the course will expose the students to new ideas and enhance their experimental, participative and life skill.
II	CC3	NONCHORDATE II	Students will be able to understand the fundamental principles of systematic in which the Coelomates, Annelida, Arthropoda, Onychophora, Mollusca and Echinodermata are classified according to their characters up to class. → They will be introduced to

			<p>the concept of metamorphosis in insects, respiration in Arthropoda, torsion and detorsion in gastropods, pearl formation in Mollusca and life cycles showing the intricate social structure in these invertebrates. The practical included in the course will enable the students to identify the specimens of the above mentioned phyla and also it's evolutionary significances</p>
II	CC4	CELL BIOLOGY	<p>The learners will understand and be able to compare and differentiate between the prokaryotic and eukaryotic system. The students will be able understand the structures, cellular mechanisms and functioning of basic components of prokaryotic and eukaryotic cell component particularly plasma membrane, endomembrane system, mitochondria, peroxisomes, cytoskeleton and nucleus. Acquire the detailed knowledge of different pathways related to cell signalling and mechanism of cell division – mitosis and meiosis. The practical included in the course will enable the students to visualize chromosome behaviour during cell division in onion root tip and grasshopper testis. The students will learn to demonstrate the presence of Barr body, mucopolysacchradies and protein by using appropriate stain/reaction in preparing permanent slide.</p>

III	CC5	CHORDATE	The students will be able to describe the origin of chordates and also general taxonomic rules on classification of chordate and protochordata. Students will be able to understand the fundamental principles of systematic in which the Agnatha, Pisces, Amphibia, Reptilia, Aves and Mammals are classified according to their characters up to class. 3 Students will be familiarized with biting mechanism of snake, parental care in different animals, flight adaptation in birds and also adaptive radiation in mammals. Zoogeography included in the course will enable the students to understand the pattern of distribution of animal with the help of pertaining theories –Plate tectonic and Continental Drift Theory. → The practical included in the course will enable the students to identify the specimens of the different class and also it's evolutionary significance.
III	CC6	ANIMAL PHYSIOLOGY	The students will be introduced to the terminologies and working mechanism relating to various organs systems in animal physiology- tissue, bone and cartilage, reproductive system, nervous system, muscular system and endocrine system.
III	CC7	BIOCHEMISTRY	The students will learn about the chemical foundation of biology-pH. pK, acid and base, buffer

			and free energy. Students will understand the basis and fundamental biochemistry of carbohydrate, lipids, protein and nucleic acids. They will also be able to understand the nature and mechanism and kinetics of enzyme action. Students will understand the role of thermodynamics in biology and ATP in metabolism
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SEMESTER	COURSE CODE	COURSE TITLE	COURSE OUTCOME
IV	CC 8	COMP. ANATOMY OF VERTEBRATES	The student will understand in detail about the Integumentary system, skeletal system, Digestive system, Respiratory system, circulatory system, nervous system and sensory system. → They will be able to compare and differentiate the above mentioned systems in different vertebrate group. → The practical included in the course will enable the students to practically visualize and demonstrate different types of scales in fish, carapace and plastron in tortoise and also mammalian skull.
IV	CC9	ANIMAL PHYSIOLOGY	Students will learn physiology of digestion, absorption of carbohydrates, lipid, proteins etc. mechanisms of respiration, physiology of circulation, cardiac cycle, cardiac output, blood pressure and its regulation, thermoregulation and

			<p>osmoregulation, thermal biology.</p> <p>Students also learn practical aspects of life sustaining systems like determination of ABO blood group, estimation of Hb, recording of BP etc.</p>
IV	CC10	IMMUNOLOGY	<p>Students will learn an overall perspective, innate and adaptive immunity, antigenicity and immunogenicity, hybridoma technology, properties and functions of cytokines and complement system and vaccines.</p> <p>Students will also learn the practical aspects of different lymphoid organs, histological studies of spleen, thymus, TC, DC of WBC and ELISA method.</p>
V	CC11	MOLECULAR BIOLOGY	<p>This course provides basic molecular structure and chemistry of DNA, RNA. This course describes how DNA is replicated in prokaryotes and eukaryotes and how information is transferred by means of transcription and translation. This course also describes the post-transcriptional RNA processing, regulation of gene expression and role of siRNA miRNA in this regard. It also explains how organism prevent and repair DNA damage. This course also imparts practical knowledge how to isolate, measure and separate nucleic acid as</p>

			well as isolation and staining of chromosome.
V	CC12	GENETICS	This course describes different types of inheritance such as, incomplete dominance, co-dominance, sex-linked, sex-limited, sex-influenced etc., enabling students to critically analyse the mode of inheritance. This course also inculcate knowledge among the learners about the chromosomal mapping, cause of mutation. Students also learn how recombination and transfer of genetic element took place in bacteria.
VI	CC13	DEVELOPMENTAL BIOLOGY	While going through this course the learners will understand how multicellular organism are formed from single cell, molecular mechanism and cell-cell interactions of such complex and integrated development. This course also describes the developmental process of two model organs such as eye and brain. Besides, this course also imparts knowledge about fascinating field of regeneration, <i>in vitro</i> fertilization, stem cell therapy etc. Students also develop the skill to culture and maintain model organism such as <i>Drosophila</i> .
VI	CC14	EVOLUTIONARY BIOLOGY	Among the students this course inculcates the knowledge how life is originated and progressed from simple

			<p>molecules to unicellular and then to complex multicellular organisms. Students also able to understand the various laws and principles of evolution. They also know how hominid are originated and evolved. They also gain knowledge to construct and interpret phylogenetic tree.</p>
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SEMESTER	COURSE CODE	COURSE TITLE	COURSE OUTCOME
III	SEC I	SERICULTURE	<p>Students will learn about the history and present status of mulberry and non-mulberry sericulture. They will also be able learn about the life cycles, rearing, pest management and entrepreneurship in non-mulberry sericulture.</p>
IV	SEC II	MEDICAL DIAGNOSTIC	<p>The objective of this paper is to give students a unique opportunity to learn how doctors and clinicians make decisions about disease prognosis, prevention, diagnosis. Students will gain knowledge about various infectious, non-infectious and lifestyle diseases, tumors and their diagnosis. After completing this course, the students should be able to learn scientific approaches/techniques used in the clinical laboratories to investigate various</p>

			diseases. This paper will also help to gain knowledge about common imaging technologies and their utility in the clinic to diagnose a specific disease.
V	DSE I	ANIMAL BIOTECHNOLOGY	Students going through this course able to acquire modern day biotechnological techniques like gene cloning, cDNA synthesis and cloning, PCR, blotting, DNA sequencing, animal cell culture. This course also provides knowledge about production of transgenic organism for the benefit mankind
V	DSE II	PARASITOLOGY	After completion the course student will be able to understand the mode of transmission of different parasites, their infective stages and what preventive measures can be taken to get rid of those parasites. They will also able to identify differ parasites and how to isolate and preserve different parasites.
VI	DSE III	ANIMAL BEHAVIOUR	The main objective of this course is to provide theoretical knowledge about different types of animal behaviour and their importance for the benefit of the organism. Student also able to learn how solar and lunar cycle affects the biological rhythms and activity of organisms. Not only that they also

			understand the applied value of such knowledge for the benefit of mankind.
VI	DSE IV	ENDOCRINOLOGY	Endocrinology will help the students to understand the endocrine system, basic properties and functioning of different hormones. They will gain knowledge about the mechanism of hormone action and their regulation. Learners will also able to learn the consequence of disorders of different endocrine glands.