

Department of Zoology

PROGRAM OUTCOMES, PROGRAM SPECIFIC OUTCOMES & COURSE OUTCOMES OF B.SC IN ZOOLOGY.

Program outcomes (PO)

- After studying this program, 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.
- Students will be able to qualitatively and quantitatively analyze evolutionary parameters using various bioinformatics and computational tools used in modern sciences.
- It provides 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.
- Students have the option to go for higher studies, i.e., M. Sc. / Integrated MS Ph.D. and then do research work for the welfare of mankind
- 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.

Program Specific Outcomes (PSOs)

The department offers undergraduate program with zoology as honors to impart quality education in the subject of zoology as a basic science and its applied branches to the students.

The department aims:

- To give complete knowledge of disciplinary and as well as allied biological sciences.
- To enable students to correctly use biological instrumentation and proper laboratory techniques.
- To facilitate higher education and research in zoology.
- To motivate students for self-employment in applied branches of zoology.
- To conduct field studies and different projects of local interest.
- To provides opportunities for professional and personal development through extracurricular activities.

Course outcomes (Cos)

SEMESTER I

ZOO-HC-1016: Non-chordates I: Protista to Pseudoceolomates

- The course will enable the students to learn all the identification characteristics and the classification upto classes from the phylum Protista to Nematelminthes.
- It also covers all the important biologically significant process or life cycles of the given phylum in the course.
- The practical section of the course enables the students to learn the distinct morphological differences of the specimens that will help in identification of any specimen.

ZOO-HC-1026: Principles of ecology

- The course provides the basic understanding of ecology, inter relationship of population and communities of the ecosystem and also management of wildlife ecology.
- The course will enable the students to develop an understanding of the differences in the structure and function of different types of ecosystem.
- Students will learn techniques of data analysis as well as methods of presenting information in figures and tables.
- Through the practical section of the course the students are able to work on various field data or hypothetical data and learn various type of data analysis. It also offers the students to visit a National Park or Wildlife Sanctuary.

ZOO-HG/RC-1016: Animal Diversity

- The detailed course designed for Generic and Regular students on animal diversity enable them to learn about Non Chordates and Chordates.
- It enhances the knowledge on all the general features, classification and important biological process present in all the Animal kingdom.
- The practical enables the students to easily identify the specimens and classify it.

SEMESTER II

ZOO-HC-2016: Non-chordates II-Coelomates

- The course enables the students to understand about coelomates animals of the following phylum: Annelida, Arthropoda, Onychophora, Mollusca and Echinodermata.
- The course provides detailed coverage of the characteristics, classification, and identification, biologically important process and life cycles of certain ceolomates.
- Through the practical of this course students are able to learn the identification and classification methods of the specimens.

ZOO-HC-2026: *Cell Biology*

- The course will enable students to understand the structures and purpose of basic components of prokaryotic and eukaryotic cells.
- Students will learn about all the cellular components and the functioning of cellular components in cell division.
- The practical portion enable the students to get hands on experience on preparation of various permanent and temporary slides through which various cellular components and cell division are studied.

ZOO-HG/RC-2016: *Comparative Anatomy and Developmental Biology of Vertebrates*

- The course designed for generic and regular students enable the students to understand the concept of anatomy and developmental biology of Vertebrates together.
- Students will learn about the Anatomy of the vertebrates in a comparative manner which help in easy differentiation.
- The developmental biology portion of the course enable the students to learn about the history of complex life forms and its developmental process.
- The practical allows the comparative study on osteology and various developmental stages of frog, different types of placenta and gametes of frog/rat.

SEMESTER III

ZOO-HC-3016: *Diversity of Chordata*

- This paper is solely dedicated on the study of chordates which allows the students to learn about diversity of chordates and its systemic position.
- The course makes the students aware of the economic importance of some classes. Understand the evolutionary importance of selected chordate groups.
- The practical enable the students to strengthen their knowledge on identification and classification of various chordate animals.

ZOO-HC-3026: *Animal physiology: controlling and coordinating systems*

- The course develop an understanding on the physiology of coordinating systems such as tissue, bone & cartilage, nervous system and reproductive system.
- It familiarize the students on the concepts of hormones and endocrine system.
- The practical allows the students to learn the detailed process of Microtomy and gives a hands on experience on making of temporary and permanent slides of mammalian tissues.

ZOO-HC-3036: *Fundamentals of Biochemistry*

- The course offers advance understanding of the core principle and the topics of Biochemistry and their experimental basis.

- It enables fundamental understanding of all the biomolecules and enzyme kinetics.
- The practical enables qualitative tests on various functional groups and experiments on action of salivary amylase. It also familiarizes on the proteins separation through SDS-PAGE.

SKILL ENHANCEMENT COURSE SEC-1

ZOO-SE-3014: *Sericulture*

- The course enable detailed and advance understanding of the biology of silkworms, its rearing techniques and its pests and diseases.
- The course focuses on entrepreneurship in sericulture and offers a visit to various sericulture centers.

ZOO-HG/RC-3016: *Human physiology*

- The course enable the students to learn about overall physiology in human such as digestion, respiratory, nerve & renal physiology and reproduction.
- It also enlightens the students on the aspect of hormones and endocrinology.
- The practical offers hands on experience on basic preparation of temporary mounts. It also enable the students to learn various Hematology tests and strengthen their knowledge on various histological sections of mammalian organs.

SEMESTER IV

ZOO-HC-4016: *Comparative Anatomy of Vertebrates*

- The course is a detailed course on comparative study of various anatomical structures of Vertebrates, which enables the students to compare various vertebrates.
- It enlighten the students on comparative aspect in terms of the types, succession, and evolution of various systems of vertebrates.
- The practical familiarizes the students on the comparative account of vertebrates through the study of different types of scales, disarticulate skeleton and mammalian skulls.
- It also allows the students to try a hand on dissection of rat for the study of arterial and urogenital system. (as per UGC guidelines)

ZOO-HC-4026: *Physiology: Life Sustaining Systems*

- Through this course students are provided with detailed knowledge of physiological functioning of various systems.
- It develops an understanding of the fundamental concepts of Blood vascular system.
- The major portion of the practical enable the students to learn various hematological experiments.

ZOO-HC-4036: *Biochemistry of metabolic processes*

- The course aims in detailed understanding of metabolism, its metabolic pathways, shuttle systems and membrane transporters.
- It develops an understanding of fundamental concepts of metabolism of biomolecules such as carbohydrate, lipid and protein.
- The practical course offer students various biochemical assays such as detection of SGOT/SGPT, total protein estimation, etc. It develop skills of performing basic biochemical tests important in clinical investigations and to develop familiarity with biochemical laboratory techniques.

SKILL ENHANCEMENT COURSE SEC-2

ZOO-SE-4024: *Aquarium Fish Keeping*

- This course enhances the interest and scope of Aquarium fish industry.
- It enable the students to learn about the biology of aquarium fishes, its feeding and maintenance.
- After the completion of this course students will be able to take up fisheries or fish keeping as an entrepreneurship option.

ZOO-HG/RC-4016: *Genetics and Evolutionary Biology*

- The completion of the course will enable students to understand fundamental terminology and concepts in the fields of genetics and evolution.
- Students will be able to understand basics of genetic concepts such as linkage, crossing over & recombination and various mutations.
- The evolutionary part enables to understand core concept of beginning of life, various theories & evidences of evolution and lastly the concept of mass extinction.
- Through the practical the students are able to study various genetic concepts based on linkage maps, numerical on cross overs and study of karyotypes. It enhances knowledge on evolutionary concepts and offers a visit to National History Museum.

SEMESTER V

ZOO-HC-5016: *Molecular Biology*

- On the completion of the course, students will learn about the concepts of DNA, RNA, and their replication, mutations, regulations, DNA repair mechanism.
- Through this course students will gain understanding on the molecular mechanisms of DNA replication, transcription, translation, and gene regulation in both prokaryotes and eukaryotes.
- The practical enable hands on experience of the students through various molecular analysis experiment. Students will gain insight into the most significant molecular and cell based methods.

ZOO-HC-5026: *Principles of Genetics*

- On the completion of the course students will gain a detailed understanding of the basic concepts of Genetics, heredity and inheritance.
- Students will get detailed insight about sex determination, mutations, extra chromosomal & polygenic inheritance and transposable elements.
- Through the practical students are able to study linkage mapping, pedigree analysis and chi square analysis.

ZOO-HE-5016: *Immunology*

- Through this course students are able to understand the overview of Immune system and how immunity works in human body.
- Students will learn about the cellular and non-cellular components of the immune system and the ways they interact to provide immunity.
- The practical enable the students to gain knowledge on histological study and various immunological assay

ZOO-HE-5026: *Animal Biotechnology*

- The course familiarize all the techniques used in Animal Biotechnology.
- It gives an insight on the concepts and scope of Biotechnology.
- The practical enable the students to study various techniques used in Biotechnology and gives a hands on experience on genomic DNA and plasmid isolation.

SEMESTER VI

ZOO-HC-6016: Developmental Biology

- The course enable students to learn detailed information of early, late and post embryonic developmental process.
- It also gives insight on the implications of Development Biology.
- The practical provide students with expertise on identification of various developmental stages of frog, chick and drosophila.

ZOO-HC-6026: Evolutionary Biology

- Through this course students gain detailed understanding about the beginning of life, theories and evidences of evolution, micro evolutionary changes and mass extinction.
- It also enable the students to learn about population genetics and methods to construct phylogenetic tree.
- The practical portion enable the students to learn methods used in population genetics. Students will gain insight on the study of fossils, homology & analogy of specimens and construction of phylogenetic tree.

ZOO-HE-6016: Fish and Fisheries

- On completion of the course, students will gain detailed understanding on the classification, morphology and physiology of fishes.
- Students are able to gain knowledge on fisheries, aquaculture and transgenic fish as model organism.
- The practical enable students to study different morphology and physiology of fishes. Students will learn about to water quality criteria in aquaculture.

ZOO-HE-6026: Endocrinology

- The course enable the students to gain detailed understanding about the history of endocrinology, roles of endocrine system in maintaining homeostasis, integrating growth and development.
- Students get insight on the regulation of hormone action.
- The practical allow students to get hands on experience on dissection of rat to study various endocrine system and learn the castration/ovariectomy process (as per UGC guidelines).