

Department of Zoology

B.Sc. Honours in Zoology CBCS based Six -Semester Programme

Programme Outcome:

After completion of the three-year six-semester undergraduate programme in Zoology, the students will be able to:

- To understand the fundamental principles of Zoology, including its historical development, its relevance to society, and its relationship with other scientific disciplines.
- To identify, describe, and classify organisms, including their morphology, functional anatomy, physiology, ecology and behaviour.
- To develop a strong foundation in cell and molecular biology, genetics, developmental biology, ecology and evolution, and apply this knowledge in the shaping of life processes.
- To create practical skills in laboratory techniques, fieldwork, and data analysis and the interpretation of datasets.
- Students will be able to apply the scientific methods to investigate and solve biological problems.
- To develop critical thinking and analytical skills to evaluate scientific literature and develop evidence-based arguments.
- To communicate scientific information effectively to different audiences.
- To demonstrate an understanding of the ethical and societal implications of biological research.
- To develop transferable skills, including teamwork, problem-solving and time management.
- To develop a commitment to stay up- to- date with the latest advances in Zoology.

Course outcome:

Course Code	Course Name	Course Outcome
CC1 Semester 1	CC1-1 Non-chordates	<ol style="list-style-type: none">1.Students will be able to get an idea about how to name an organism and how to place them in an appropriate category as per rules of ICZN.2.Students will get a clear concept about Protists. They will also get a picture of biological diversity, behaviour, and ecological/medical significance of some protists if any.3.Students will be acquainted with the evolution of metazoan animals with special reference to acoelomates and pseudocoelomates and coelomates.
	CC1-2 Molecular biology	<ol style="list-style-type: none">1.Students will get very basic information about Molecular Biology.2.Students will build up knowledge on the structural properties of nucleic acids with special reference to DNA and RNAs.3.Students will be able to know the concept of ‘Central dogma of molecular biology’.4.They will be acquainted with the process of gene regulation both in prokaryotes and eukaryotes.5.They will get a clear picture of how genetic material is repaired in vivo.6.They will also know the basic working principle of some molecular techniques.
GE1	ZOOG-CC1-1 Animal Diversity	<ol style="list-style-type: none">1. Students will be able to understand and classify the great variety of living species2. This study will help them better understand how to conserve the diversity of life on earth
CC2 Semester 2	CC2-3 Non-chordates	<ol style="list-style-type: none">1.Students will understand evolutionary history and relationships of different non-Chordates through functional and structural affinities.2.Students will be able to describe the unique characters of Annelida , Arthropoda, Mollusca and Echinodermata.
	CC2-4 Cell biology	<ol style="list-style-type: none">1. Students will understand the structures and purposes of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles.2. Students will understand how these cellular components function in a healthy cell.3. Students will understand the cellular components responsible for cell cycle regulation and apoptosis.4. They will have an overview of cancer biology and oncogenesis.5. Students will apply their knowledge of cell biology to selected examples of changes or losses in cell function. These can include responses to environmental or physiological changes, or alterations of cell function brought about by gene mutation.

CC3 Semester 3	CC3-5 Chordata	<ol style="list-style-type: none"> 1. The students will develop clear concept on different vertebrate forms, their taxonomic position, anatomy, structural features and associated physiological mechanisms. 2. They will learn the process of classification from Protochordates to Mammals properly. 3. They will develop knowledge on complex vertebrate associations and interactions.
	CC3-6 Animal Physiology	<ol style="list-style-type: none"> 1. This course will disclose fundamental physiological principles of animals along with finding out their interrelation between structure and function. 2. Students will develop an understanding of the related disciplines, such as cell and molecular biology, their genetic perspective, neurophysiology, pharmacology, biochemistry etc. It will further enable the students to think and interpret individually due to different aspects chosen. 3. They will undertake research in any aspect of animal physiology in future. They will compare physiological systems across the animal kingdom including thorough and in-depth topic presentations
	CC3-7 Fundamentals of Biochemistry	<ol style="list-style-type: none"> 1. After successfully completing this course, the students will be able to understand about the importance and scope of biochemistry and also understand the structure and biological significance of carbohydrates, amino acids, proteins, lipids, nucleic acids and enzymes. 2. They also learn biochemical tests for amino acids, carbohydrates, proteins and nucleic acids and do measurement of enzyme activity and its kinetics
SEC-A	Sericulture	<ol style="list-style-type: none"> 1. Students would gain a brief background on different components of Sericulture. 2. They will learn about the origin, growth and status of the sericulture industry across the globe. 3. Students would know all about mulberry plants and cultivars in the field. 4. They would gain knowledge and acquire skill in cultivation of mulberry plants in the garden
CC4 Semester 4	CC4-8 Comparative Anatomy of Vertebrates	<ol style="list-style-type: none"> 1. Students will develop an understanding of the evolution of vertebrates thus integrating structure, function and development 2. They will understand how cells, tissues, and organisms function at different levels. The course content also provides the basis of understanding their abnormal function in animal and human diseases and new methods for treating those diseases 3. They will have an overview of the evolutionary concepts including homology and homoplasy, and detailed discussions of major organ systems

	CC4-9 Animal Physiology: Life Sustaining System	<ol style="list-style-type: none"> 1. This course will explore the basic physiological principles common to animals, relating structure to function. 2. Students will develop an understanding of the related disciplines, such as cell biology, neurophysiology, pharmacology, biochemistry etc. It will further enable the students to think and interpret individually due to different aspects chosen. 3. They will undertake research in any aspect of animal physiology in future. They will compare physiological systems across the animal kingdom including thorough and in-depth topic presentations
	CC4-10 Immunology	<ol style="list-style-type: none"> 1. Students will have an overall idea of the vertebrate immune system with special reference to humans, its key components and functions. 2. Conceptualize how the innate and adaptive immune responses coordinate to fight invading pathogens. 3. Determine what immunomodulatory strategies can be used to enhance immune responses or to suppress unwanted immune responses like hypersensitivity. 4. Get an idea of monoclonal antibody generation and its significance. 5. Explore different existing and upcoming vaccination strategies to combat several diseases.
SEC-A	Aquarium Fishery	<ol style="list-style-type: none"> 1. Students will apply information and practical experience in aquarium decoration 2. They will learn about management, development, breeding and rearing of ornamental fish 3. This course aims to familiarise the students with the principles of ornamental fish culture management, history and status of ornamental fish industry
GE2	Comparative anatomy and Developmental Biology	<ol style="list-style-type: none"> 1. Students will have a vivid idea on different systems viz., Integument, circulation, digestion, respiration and urino-genital systems in a series of vertebrates. 2. They will learn about the very basics of developmental biology with special reference to gametogenesis, fertilisation, cleavage and gastrulation. 3. They will have a general idea about placenta and metamorphosis in frog.
AECC2	Environmental Studies	<ol style="list-style-type: none"> 1. This course helps to understand the importance and dimension of a healthy environment for sustainable development. 2. Comprehend the significance and issues related to ecosystems, natural resources and biodiversity and become aware of the need and ways to protect/ preserve them. 3. Grasp the issues related to environmental pollution, solid waste management and climate change, and become conscious and proactive in the discharge of their responsibilities towards the environment. 4. Become aware and appreciate the values and concerns of environmental movements and policies and the role of communities, and act responsibly on environment-related issues.

CC5 Semester 5	CC5-11 Ecology	<ol style="list-style-type: none"> 1. Know the evolutionary and functional basis of basic ecology. 2. Understand what makes the scientific study of animal ecology a crucial endeavour. 3. Engage in field-based activities to learn techniques for gathering data from the field. 4. Analyse a biological problem, derive testable hypotheses and then design experiments and put the tests into practice. 5. Understand the environmental problems involving interaction of humans and natural systems at local or global level.
DSE-A1	CC5-12 Principle of Genetics	<p>The students will get a thorough concept on Fundamental mechanisms of Mendelian genetics, linkage mapping, sex determination, extra chromosomal inheritance etc. and they will also learn about advanced topics like mutations, genetic fine structure and transposable genetic elements.</p>
	Parasitology	<ol style="list-style-type: none"> 1. The first aim of this paper is to engage all students in enriching, enjoyable and intellectually stimulating learning experiences. 2. This course offers an overview of the biological and epidemiological bases of important parasitic diseases and an understanding of the impact of parasitic diseases on endemic communities. 3. It covers many disciplines while studying the life-cycles, ecology, physiology, biochemistry, immunology, pathology and molecular biology of the covered parasites. 4. Both protozoan parasites (unicellular parasites) and parasitic helminths (parasitic worms) will be considered with emphasis on the most important parasites of humans.
DSE-B1	Endocrinology	<ol style="list-style-type: none"> 1. They will learn in depth knowledge on hormone interaction among various internal and external conditions by means of chemical modulations on various physiological processes. 2. They will understand functions of different hormones and their regulations in cellular and molecular levels.
CC6 Semester 6	CC6-13 Developmental Biology	<ol style="list-style-type: none"> 1. The students will gain fundamental knowledge on principles of development of animals from zygote in the life cycle. 2. Various fundamental and genetic processes of development of animals are discussed.

	CC6-14 Evolutionary Biology	<ol style="list-style-type: none"> 1. Students will get an idea on the origin of life on our planet 2. They will be able to learn about concepts on the mechanism of origin of new species given by Lamarks, Darwin and NeoDarwinists. 3. They will get a vivid picture about geological time scale, fossil records and K-T extinction and human evolution. 4. They will be able to explain genetic aspects of variation in a species population. 5. They will learn about constructing phylogenetic trees using parsimony.
DSE-A2	Animal Biotechnology	<ol style="list-style-type: none"> 1. The students will learn the basic theoretical knowledge of biotechnology and the process as well as applications of biotechnology in agriculture, pharmaceutical research and transgenesis. 2. They will get knowledge on principles of cell & tissue culture, GMOs and gene therapy
DSE-B2	Fish and Fisheries	<ol style="list-style-type: none"> 1. Students understand the types of fisheries and aquaculture and apply relevant scientific principles in the area of aquatic biology 2. they will critically analyse, interpret and evaluate information relevant to aquaculture and fisheries 3. They will appreciate the multidisciplinary nature of the study of Fish and Fisheries and engage positively with people and ideas beyond their own discipline 4. Develop <i>employable skills</i> in freshwater biological water quality analysis