

ANNEXURE1.1

OBJECTIVES OF THE DEPARTMENT

- ❖ To expand knowledge in fields such as animal behavior, ecology, evolution, genetics, physiology, and taxonomy.
- ❖ Conservation and management of animal species and ecosystems.
- ❖ To increase awareness and appreciation of the natural world and the importance of biodiversity conservation.
- ❖ Collaborating with other departments, research institutions, and organizations to address interdisciplinary questions and challenges.
- ❖ Embracing new technologies and innovative approaches to study animal biology and address conservation challenges.
- ❖ Supporting the professional development of faculty, staff, and students through opportunities for training, collaboration, and networking.

PROGRAMME OUTCOMES (POs)

The Programme has been designed to enable the students to understand

- ❖ Vital aspects of biological processes like Comparative Animal physiology, Endocrinology, Microbiology, Environmental Biology, Evolution, Animal Biodiversity, Conservation etc.
- ❖ The application of biological sciences in other entrepreneurship skill enhancing fields viz., Apiculture, Fisheries, Aquaculture, Aquarium Fish keeping, Vermiculture etc.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

SEMESTER-I

PSO1: the basic concepts and components of various ecosystems with respect to habitat, community structure, biodiversity and conservation strategies.

PSO2: the nature and structure of genetic material, basic genetic principles and processes involved.

PSO3: the fish taxonomy, morphology, physiology and adaptive strategies.

PSO4: the concepts of immunity and immunological processes. PSO5: the morphology, ecology and physiology of insects.

SEMESTER-II

PSO-1: the nature and basic concepts of cell biology and instrumentation.

PSO-2: a comparative account of structure & functioning of various organs and organ systems as developed during evolution.

PSO-3: the basic morphology, anatomy, histology, endocrines and their functioning.

PSO-4: the study of biotechnological techniques and their applications. PSO-5: the concepts of biodiversity and their management.

SEMESTER-III

PSO-1: the basic and advanced concepts of animal physiology in mammals.

PSO-2: the structure, function and metabolic pathways of various bio-molecules.

PSO-3: evolutionary trends of diverse taxa along the geological time scale.

PSO-4: various skill based and entrepreneurship oriented practices such as insect management, poultry / dairy breeds, aquaculture etc for human welfare.

SEMESTER - IV

PSO1: advances in reproductive behaviour and developmental processes in vertebrates.

PSO2: crucial aspects involved in modern aquaculture practices.

PSO3: basic and applied aspects of microbiology in medicines, industries and agriculture.

PSO4: critical aspects of limnology with emphasis on bio resource management.

PSO5: basic concepts, utility and management strategies in fish and fisheries.

PSO6: principles of inheritance and advances in cytogenetic and molecular biology.

PSO7: the key concepts of insect behaviour, ecology, their interactions and role in agriculture.

PSO8: biological anthropology and its use for human welfare

SEMESTER-WISE COURSE OUTCOMES (COs)

Course Title	Course Learning Outcomes
SEMESTER-I	
Ecology & Environmental Biology	Students shall be able to <ul style="list-style-type: none">❖ CO1: the concept of basic theories and principles of ecology.❖ CO2: critical understanding of the concepts like population dynamics, community structure and abundance, species interactions, energy flow, productivity, succession, biological invasions etc.❖ CO3: critical understanding of the human influence on environment.❖ CO4: the practical aspects based on research/field trainings.
Fundamentals of Genetics	Students shall be able to: <ul style="list-style-type: none">❖ CO1: basic concepts of chromosomes, their special forms and aberrations.❖ CO2: structure of genetic material, basic hereditary principles ; mutations and DNA repair mechanism .❖ CO3: fundamentals of DNA replication, protein synthesis and control of gene expression.
Ichthyology	Students shall be able to: <ul style="list-style-type: none">❖ CO1: the fish classification, structure and adaptations in relation to diverse habitat conditions in fishes.❖ CO2: the basic concepts of feeding, reproductive & respiratory ecology in fishes❖ CO3: parental care and adaptive capabilities to special environment in fishes etc.
Immunology	<ul style="list-style-type: none">❖ CO1: the basic knowledge about immune system and its role in improving general health and immunity.❖ CO2: critical concepts of immune system, immune cells and immunological techniques

	❖ CO3:tumour immunology and transplantation immunology
An Introduction to Insect Diversity	<p>Students shall be able to:</p> <ul style="list-style-type: none"> ❖ CO1: the basic knowledge about the morphology, taxonomic diversity and physiology of insects. ❖ CO2: Critical understanding of the key concepts of insect ecology, biology and its relationship with various biotic and abiotic factors. ❖ CO3: practical and applied aspects of entomology.

SEMESTER-II	
Cell Biology & Research Instrumentation	<p>Students shall be able to:</p> <ul style="list-style-type: none"> ❖ CO-1: the structural and functional unit of life. ❖ CO-2: the basic concepts of cell biology: cell cycle, cell communication, cell signalling and cell death. ❖ CO-3: principles and working of various instruments for the study of cell architecture, cellular components and cell machinery.
Functional Anatomy of Animals	<p>Students shall be able to:</p> <ul style="list-style-type: none"> ❖ CO1: comparative functioning of the organ systems across the animal world. ❖ CO2: the insights into developmental and physiological adaptations vs evolutionary strategies. ❖ CO3: coordination of various biological systems within diverse animal groups

Basic Endocrinology	<p>Students shall be able to:</p> <ul style="list-style-type: none"> ❖ CO-1: the comparative morphology and physiology of neuro-endocrine systems in invertebrates and vertebrates. ❖ CO-2: the basic information about the endocrine glands & their secretions. ❖ CO-3: the working principles of hormones and their related deficiency diseases.
Biotechnology	<p>Students shall be able to:</p> <ul style="list-style-type: none"> ❖ CO-1: the basics and applied aspects of biotechnology and animal tissue culture. ❖ CO-2: the advanced biotechnological practices and approaches. ❖ CO-3: technology application in medical, industrial, environmental and agricultural areas.
Biodiversity, Conservation & Management	<p>Students shall be able to:</p> <ul style="list-style-type: none"> ❖ CO1: the basic concepts of biodiversity and its use for human welfare. ❖ CO2: critical understanding of Indian biodiversity and its zoogeographical distribution. ❖ CO3: threats to biodiversity and conversational scope and strategies.

SEMESTER-III	
Animal Physiology	<p>Students shall be able to:</p> <ul style="list-style-type: none"> ❖ CO-1: Basic concepts of physiology: digestion, respiration, excretion, cardiovascular, excretory, nervous and muscular systems. ❖ CO-2: gastrointestinal disorders, respiratory stresses vs environment. ❖ CO-3: the mechanisms that work to keep the human body alive and functioning
Fundamentals of Biochemistry	<p>Students shall be able to:</p> <ul style="list-style-type: none"> ❖ CO-1: structure, types and classification of proteins, carbohydrates and fats. ❖ CO-2: enzymes and mechanism of enzyme action. ❖ CO-3: metabolic pathways of various bio-molecules and their functional significance.
Biosystematics, Taxonomy & Evolution	<p>Students shall be able to:</p> <ul style="list-style-type: none"> ❖ CO1: the importance and application of biosystematics. ❖ CO2: evolution with reference to various theories of organic evolution. ❖ CO3: the major events in evolutionary time scale. ❖ CO4: concepts, origin and mode of speciation. ❖ CO5: evolution of man in lieu of evidences favouring biological evolution.

SEMESTER-IV	
Reproductive & Developmental Biology	<p>Students shall be able to:</p> <ul style="list-style-type: none"> ❖ CO-1: the gonads and their role in reproductive process. ❖ CO-2: the factors and breeding behaviour in non mammalians and mammalians. ❖ CO-3: the mechanism, patterns and processes involved in cleavage, blastulation and gastrulation. ❖ CO-4: the key concepts of neural tube formation, organ formation in birds and mammals, metamorphosis in amphibians
Aquaculture	<p>Students shall be able to:</p> <ul style="list-style-type: none"> ❖ CO1: various forms and practices of aquaculture. ❖ CO2: aquaculture practices with special emphasis on culture of aquatic organisms ❖ CO3: preparation and management of different types of ponds for carp culture. CO4: types of fish feed, their composition and formulation techniques.
Microbiology	<ul style="list-style-type: none"> ❖ CO1: microorganisms and their application in health, industries and agriculture. ❖ CO2: transmission mechanism and clinical presentations of common diseases. ❖ CO3: agriculture / soil microbiology and bio remediation.
Limnology	<ul style="list-style-type: none"> ❖ CO1: limnological aspects of inland freshwater resources. ❖ CO2: relation of inland water resources with the terrestrial ecosystem. ❖ CO3: biological diversity of lentic and lotic water bodies. ❖ CO4: conservation, management and rehabilitation aspects of wetlands. .

Fish & fisheries	<ul style="list-style-type: none"> ❖ CO1: present status and future potential of fish resources of India. ❖ CO2: fish: its biotic and abiotic environment. ❖ CO3: fish breeding: culture and captive breeding techniques. ❖ CO4: fish nutrition: requirements, processing and preservation techniques. ❖ CO5: fish aquarium : setting and health management
Molecular Genetics & Cytogenetics	<ul style="list-style-type: none"> ❖ CO1: analysis of human chromosomes by using classical and advanced cytogenetic techniques. ❖ CO2: genetics of human disorders by Pedigree analysis and karyotyping ❖ CO3: genetic and molecular basis of human genetic diseases. ❖ CO4: human genome project, human cloning, single gene and multifactorial disorders
Entomology	<ul style="list-style-type: none"> ❖ CO1: importance of beneficial and non-beneficial insects. ❖ CO2: applied aspects of insects and their services to human welfare. ❖ CO3: insect behaviour, insect plant interactions, insect pest management and their control measures.
Biological Anthropology	<ul style="list-style-type: none"> ❖ CO-1: biological anthropology: historical background, scope and application. ❖ CO-2: history of human evolution / principles and processes of human evolution. ❖ CO-3: human biology; genetics, epidemiology and susceptibility to various diseases