

DEPARTMENT OF ZOOLOGY
NSS COLLEGE OTTAPALAM

UG PROGRAMME OUTCOME

- Understand and solve the problems of relevance to society to meet the specified needs using the knowledge, skills and attitudes acquired from humanities/sciences/mathematics/social sciences.
- Demonstrate empathetic social concern and equity centered national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.
- Understand the issues of environmental contexts and sustainable development.
- Acquire the ability to engage in independent and life-long learning in the broadest context of socio-technological changes.

PROGRAMME: B.Sc. ZOOLOGY

Programme Specific Outcome:

- Understand the biological diversity and grades of complexity of various animal forms through their systematic classification and process of organic evolution.
- Understand the roles of plants, animals and microbes in the sustainability of the environment and their interaction among themselves and deterioration of the environment due to anthropogenic activities.
- Understand the concepts and principles of biochemistry, immunology, physiology, ethology, endocrinology, developmental biology, cell biology, genetics, molecular biology and microbiology and develop technical skills in biotechnology, bioinformatics and biostatistics.
- Perform laboratory procedures as per standard protocols in the different areas of zoological branches.

Course Outcomes:

Sl. No.	NAME OF THE PAPER	COURSE OUTCOMES
CORE COURSES		
1	Animal diversity: Non-chordata Part- I	<ul style="list-style-type: none"> • Describe the principles of classification and nomenclature and understand the concepts of classification of animals • Explain the classification with examples and characteristic features of kingdom Protista, phylum Porifera, phylum Cnidaria, phylum Ctenophora, super-phylum Aschelminthes, phylum Nematoda and phylum Platyhelminthes and elucidate the salient features of each class • Elucidate the characters of Pseudocoelomate minor phyla Rotifera and Gastrotricha
2	Animal diversity: Non-chordata Part- II	<ul style="list-style-type: none"> • Explain the classification with examples and characteristic features of phylum Annelida, phylum Arthropoda, phylum Mollusca and phylum Echinodermata and describe the morphology and structural organization of <i>Neanthes</i>, <i>Penaeus</i> and <i>Pila globosa</i> • Describe the distribution, peculiarities and affinities of phylum Onychophora and phylum Hemichordata • Elucidate the characters of coelomate minor phyla Phoronida, Ectoprocta and Echiura
3	Animal diversity: Chordata Part- I	<ul style="list-style-type: none"> • Explain the characteristics of chordates and outline classification of the phylum Chordata Describe the salient features and affinities of subphylum Urochordata, subphylum Cephalochordata and its classification down to classes; elucidate the morphology and structural organization of <i>Ascidia</i> and <i>Branchiostoma</i> • Describe the salient features of subphylum Vertebrata, illustrate its classification down to classes and elucidate the characteristics of division Agnatha • Enumerate the salient features of superclass Pisces, class Amphibia and class Reptilia and illustrate its classification down to orders and the morphology and structural organization of <i>Mugil cephalus</i>, <i>Hoplobatrachus tigerinus</i> and <i>Calotes versicolor</i>
4	Animal diversity: Chordata Part- II	<ul style="list-style-type: none"> • Describe the classification of class Aves down to orders, salient features of each order with suitable examples • Enumerate the salient features and classification of class Mammalia down to orders with suitable examples • Compare the circulatory, excretory and nervous systems of vertebrates
5	Zoology Practical-I: Animal Diversity	<ul style="list-style-type: none"> • Identify and describe specified non-chordate specimens; Perform mounting of the specified organs of selected nonchordates. • Identify and describe specified chordates and specified bones of chordates;

		Prepare key for identification of venomous snakes; Perform mounting and dissection of specified organ systems of chordates.
6	Cell Biology and Genetics	<ul style="list-style-type: none"> • Understand the principles and applications of techniques in cell biology and illustrate the histological and histochemical processing of tissues • Explain the basic structure of a eukaryotic cell and the structure and functions of different organelles; Enumerate eukaryotic cell cycle and cell division by amitosis, mitosis and meiosis • Explain the causes of cancer; mechanism and significance of apoptosis • Enumerate allelic and non-allelic gene interactions
7	Biotechnology, Microbiology and Immunology	<ul style="list-style-type: none"> • Illustrate the steps in genetic engineering and animal cell culture • Understand the biological diversity of microbial forms and the various techniques for handling microbes in the laboratory; Understand the industrial and medical importance of microorganisms • Enumerate the basic structure and life cycle of bacteria and virus • Describe different types of immunity and the cells and organs of the immune system
8	Biochemistry & Molecular biology	<ul style="list-style-type: none"> • Describe the classification, types, structure, reactions and biological roles of carbohydrates, amino acids; protein structure, purification and sequencing of proteins • Explain the classification and functions of lipids and fatty acids; chemistry and structure of nucleic acids and sequencing of DNA • Explain different metabolic pathways.
9	Methodology in Science, Biostatistics and Bioinformatics	<ul style="list-style-type: none"> • Explain science, its importance, disciplines and the major steps in formulating a hypothesis; Describe the ethical concerns in practicing science • Illustrate the principles and procedures in designing experiments and elaborate the requirements for carrying out experiments • Understand the Scope and role of statistics; methods and procedures of sampling; Construction of tables, charts and graphs • Enumerate major biological databases and database search engines; Understand molecular phylogenetics
10	Zoology Practical-II	<ul style="list-style-type: none"> • Understand techniques in biochemistry. • Perform gram staining and preparation of culture media for bacteria and demonstrate bacterial motility by standard laboratory protocols. • Understand the detection of human blood groups and organs of immune system • Perform standard biochemical tests for the detection of reducing and non-reducing sugars, polysaccharides, proteins and lipids.
11	Physiology and Endocrinology	<ul style="list-style-type: none"> • Describe the physiologic processes and the regulation in man • Describe functions, composition, coagulation, transfusion, agglutination and clinical analysis of blood, haemoglobinopathies, types of heart and common cardio-vascular problems. • Describe invertebrate neuro-endocrine organs and hormones, vertebrate endocrine glands, their hormones and functions
12	Reproductive & Developmental	<ul style="list-style-type: none"> • Explain the reproductive strategies in invertebrates and vertebrates and structural and functional features of human reproductive system • Explain the scope of reproductive technologies in infertility management; prenatal diagnostic techniques and methods of fertility control

	Biology	<ul style="list-style-type: none"> • Illustrate the early developmental process of egg in Amphioxus, frog, chick and man.
13	Environmental and Conservation Biology	<ul style="list-style-type: none"> • Explain the structure of ecosystem and its functioning through energy flow and nutrient cycling • Describe the ecology of population, community and habitat as a self regulating system; Understand various types of population interactions Understand the threats to biodiversity, and strategies adapted for the conservation of diversity of organisms • Describe the toxic chemicals, their toxicity levels and the health hazards caused by them
14	Ethology, Evolution and Zoogeography	<ul style="list-style-type: none"> • Describe the patterns and mechanisms of animal behaviour • Describe the evidences for evolution and its required corollaries; Explain the various theories of evolution • Review the events in human evolution
15	Applied Entomology (Elective Course)	<ul style="list-style-type: none"> • Identify and explain the lifecycle, damages and control of insect pests of crop plants and domestic animals • Review the insect control strategies • List and describe the useful insects and the products derived from bees, silkworms and lac insects
16	Zoology Practical – III	<ul style="list-style-type: none"> • Perform standard laboratory experiments for the estimation of Hb, presence of hCG/abnormal constituents in urine, detection of blood pressure, bleeding and clotting time and identification of formed elements in blood • Carry out experiments of laboratory standards to estimate water quality parameters including, dissolved Oxygen, Carbon dioxide, hardness and pH; determination of adulteration of selected food items and identify marine planktons and soil organisms • Identify the normal and selected abnormal human karyotypes and inheritance of chosen traits from pedigree charts/describe ornamental and other culture fishes/ describe chosen beneficial and harmful insects
OPEN COURSE		
17	Reproductive health & Sex education (Open Course)	<ul style="list-style-type: none"> • Describe the structural and functional features of human reproductive system, fertilization, implantation, pregnancy, gestation, placenta, parturition and lactation. • Explain the scope of reproductive technologies in infertility management and the assisted reproductive techniques. • Understand the symptoms, mode of transmission, diagnosis and treatment of different sexually transmitted diseases and their socio economic dimensions. • Describe sexual orientation, sexual abuse and myths
COMPLEMENTARY COURSES		
18	Animal diversity and Wildlife Conservation	<ul style="list-style-type: none"> • Describe the general characters of non-chordate phyla and phylum Chordata with examples, and the structural organization of <i>Peneaus</i> sp. and <i>Oryctolagus cuniculus</i> • Explain levels of biodiversity, threats to biodiversity, biodiversity hotspots, importance and strategies for conservation of wildlife and sustainable development
19	Economic	<ul style="list-style-type: none"> • Explain parasitism and the major parasites of man and major insect vectors

	Zoology	<p>of human diseases and their control</p> <ul style="list-style-type: none"> • Understand major beneficial and harmful insects, damages caused to host plants and their control measures • Understand pisciculture, prawn, mussel and pearl culture
20	Physiology & Ethology	<ul style="list-style-type: none"> • Explain the different physiological mechanisms and its control in humans • Describe innate behavior, learned behavior, patterns of behavior and factors that affect behavior
21	Genetics & Immunology	<ul style="list-style-type: none"> • Describe human karyotype , chromosomal anomalies and polygenic inheritance • Illustrate the mechanism of recombinant DNA technology and its practical applications • Explain the types of cancer, causes of transformation and characteristics of transformed cells
22	B.Sc. Zoology Complementary Course Practical	<ul style="list-style-type: none"> • Identify the salient features of the phylum; taxonomic position, habit, habitat, adaptations/importance of selected protists, non-chordates and • Describe major human parasites and economically important insects, molluscs and fishes • Perform detection of human blood groups and prepare human blood smear as per laboratory standards; mounting of specialized organs of selected nonchordates and chordates, and demonstrate the presence of biomolecules in samples by standard laboratory protocols