DEPARTMENT OF ZOOLOGY

1. PROGRAMME OUTCOME

After completion of the undergraduate programme, the student will be able to accomplish the following programme outcomes:

PO 1. Zoology teaches about Biological sciences with biological technologies that manipulate living organism and biological systems to improve various fields, Agriculture, Sericulture, Apiculture, Poultry, Dairy, Food technology, Environment, Wild life, Sanctuaries, Forest etc...

PO 2. Understand the unity of life with the rich diversity of organisms and their ecological and evolutionary significance.

PO 3. Students will acquire competancy in laboratory skills applicable to life science research methods including accurately reporting observations and analysis.

PO 4. The knowledge of internal structure of cells and its functions in control of various metabolic functions of organisms.

PO 5. Understand about various concepts of genetics and its importance in human health.

PO 6. Understanding the fundamentals of environment, current environmental issues, conservation process and its importance. Pollution control, energy resources, biodiversity and protection of endangered species.

PO 7. Correlates the physiological processes of animals and relationship of organ systems.

PO 8. Apply ethical principles and commit to professional ethics and responsibilities in delivering his duties.

PO 9. Apply the knowledge and understanding of zoology to one's own life and develops sympathy and love towards animals.

PO 10. After completing and graduating with a degree in Zoology, the students have a wide scope in different fields. Apart from perusing for higher studies, the students can also opt from a variety of related branches and science:

. Paramedical sciences, Forestry,

. Wild life officers

. Marine biologist

. Professional field such as sericulture, poultry, apiculture, pisiculture, dairy etc...

PO 11. Acquire knowledge and skills in certain applied branches and enable them for self-employment.

2. PROGRAMME SPECIFIC OUTCOME

PSO 1. To provide thorough knowledge about various sciences from primitive to highly evolued animal groups.

PSO 2. Understanding the morphology and functional characteristics at cellular, sub cellular(molecular) and organism level.

PSO 3. Explain various physiological changes in our bodies.

PSO 4. Explain the role and impart of different environmental conservation programmes.

PSO 5. Understand various genetic abnormalities and importance of genetic engineering.

PSO 6. Understand the application of biological sciences in various fields.

PSO 7. Identify various potential risk factors to health of humans.

PSO 8. To develop the scientific temperment, problem solving attitude to promote learning and research aptitude to serve the society.

PSO 9. Pathological laboratory need technician for different analytical purposes and in forensic laboratory also need, so the student may be treated as key persons.

PSO 10. Make aware and handle the sophisticated instruments/equipments.

PSO 11. To inculcate interest and formation for further studies and research in zoology.

3. COURSE OUTCOME

COURSE NAME: ZOOLOGY I BSC ZOOLOGY

COURSE NATURE	COURSE OUTCOME I BSC
1. NON CHORDATA	CO1: Understand the animal architecture.
	CO2: Describe general characters and classification from phylum protozoa to Hemichordata with taxonomic keys.
	CO3: Understand the functional aspects of different systems of non-chordates.
	CO4: Understanding of the mode of transmission, pathogenicity, prevention and control of diseases.(protozoa,Helminthes)
	CO5: Understand the economic importance of Annelida.
	CO6: Come to know atat the resemblance and evolutionary significance of larval forms of Echinoderms.
	CO7: Understand the basis of life process in the non-chordates and recognize the economically important invertebrate fauna
	CO8:Identify various methodology and perspective of applied branches of zoology for the possibility of self employment.

	CO9: Understand the external and internal features of non-chordates.
	C10: Describe general taxonomical rules on animal classification.
II BSC	
2. **CHORDATA**	CO1: Understand the basic concepts about chordata.
	CO2: Understand the characters, morphology, larval stages and retrogressive metamorphosis in Urochordata.
	CO3: Understand the morphology , feeding mechanism and circulatory system in cephalochordate.
	CO4: Understand the classes of vertebrates Fishes, Amphibia, Reptiles, Aves and Mammals.
	CO5: Understand the origin of Amphibia, Frog osteology` and migration in fishes.
	CO6: Able to know the adaptive radiation in Reptiles, Flight adaptations in birds, migration in birds.
	CO7: To aware Aquaculture and pisciculture, composite fish farming.
	CO8: Able to understand breeds in Fowls, diseases in poultry birds, poultry products and bi-products.
	CO9: Understand the different breeds of cattle, Artificial insemination, Milk and its bi-products, pasteurization and Gober gas.
2. COMPARATIVE ANATOMY	C10: Able to know the various Respiratory organs in vertebrates.
	C11: Understand the Evolutionary trends of Heart and aortic arches in vertebrates.
	C12: Able to know about evolution of kidney in different classes of vertebrates.
	C13: Understand the Evolution of Brain in vertebrates.
3. HUMAN ANATOMY	CO14: Able to know about Digestive system, Lung, Heart, Brain, Eye and Ear.
	CO15: Understand the osteology of human.
4. CELL BIOLOGY	CO16: Able to know about structure and chemical composition of plasma membrane. Functions of membrane.
	CO17: Understand the importance of nucleus and its compounds.
	CO18: They understand the principles of cell theory, cell cycle and regulators. Cell senescence and Apoptosis.
	CO19: Able to know the general properties of cancer cells, carcinogens, preventive and regulations.
	CO20: Understand the process of chemotherapy, radiotherapy and gene therapy
5.IMMUNOLOGY	CO21: It allows the students to understand types of Immunity systems in the body and Autoimmune diseases.
6.HISTOLOGY	CO22: Understand the terms Histology and histological

	features of mammalian organs.
III BSC	
PAPER –V ENVIRONMENTAL BIOLOGY AND ECOLOGY	CO1: Imparts knowledge tot eh student regarding abiotic factors, concept of Habitat, Nisch.
	CO2: Understand various Laws of ecology, productivity, population, community characteristics.
	CO3: Students gain fundamental knowledge in Ecological successions and current environmental issues-acid rain, ozone depletion and greenhouse effect.
	CO4: Understand Toxicology, types of toxins, pest management, types of energy resourses.
	CO5: Able to know about wildlife conservations and management, Remote sensing and geographical information systems.
8.ETHOLOGY	CO6: Gains knowledge in the areas of animal behavior, communication in animals, parental care and sociobiology.
PAPER VI **9.GENETICS**	CO7: Develop idea about Mendelian, non-Mendelian inheritance, sex-linkage.
	CO8: Able to know about giant chromosomes, geneic disorder, gene mutations and Eugenics.
10. BIOTECHNOLOGY	CO9:Use in Recombinant DNA technology.
	CO10: Understand the applications of Biotechnology, Transgenesis and gene therapy.
	CO11:Knowsbout stem cells and DNA finger printing.
	CO12:They become familiar with PCR technology.
	CO13:Able to know definatations of RELP,RAPD and AFLP
PAPER VII **11. DEVELOPMENTAL BIOLOGY**	CO14:Imparts knowledge about development of different animals.
	CO15: Understand the process of fertilization, cleavage and gastrulation.
	CO16: Able to know the role of organizers in the development of organs. Formation of foetal membranes in chick.
	CO17: Understand the significance of placenta and different types with examples.
	CO18: came to know about parthenogenesis, types and its significance and the process of regenerations.
12.EVOLUTION	CO19:The course helps students gain fundamental knowledge about Neo-Darwinism and speciation.
	CO20: Understand genetic drift, Natural selection, Isolation and Isolating mechanisms.
	CO21: Able to know about paleontological evidences in fossil formation and types.
	CO22: Understand the Homologous and analogous structures in animals
	CO23: Students will gain knowledge about Human evolution.

PAPER-VIII **13. ANIMAL PHYSIOLOGY**	CO24:This course helps in understanding the biological functions of various organs and the cells of which they are composed.
	CO25: Students understand the concepts of digestion, circulation, respiration and excretion.
	CO26: Able to know about Neuro-physiology, functioning of musles and sense organs.
	CO27: Understand the concept of Endocrine systems and Homeostasis.
	CO28:Able to know the hormonal control of metamorphosis in Insects and Amphibians.
	CO29: Understand the osmoregulatatory mechanisms in animals and in migratory fishes.
	CO30:Able to know about Thermoregulation in Homotherms.
	CO31:Understand the common disorders in Man.
14. BIOLOGICAL TECHNIQUES	CO32: Enable the student to get sufficient knowledge through the principles and applications of certain useful biological techniques such as Microtechnique, chromatography, centrifugation.
	CO33: Understand the principle and applications of Autoradiography, Microtechnique and Endoscopy.
	CO34: Able to know about Immuno assay and separation techniques.

4.COURSE OBJECTIVE IN ZOOLOGY

1. To be familiar with the different Non-Chordate and Chordate Phyla their general and distinguishing characters.
2. To study how the different systems evolved and life process in different phyla.
3.To Understand the animal architecture and the taxonomic position of protozoa to hemichordata.
4. To give the students the necessary basic information about Sericulture, Apiculture, Prawn fisheries, Pearl culture, Pisciculture, Poultry, and Dairy to develop Enterpreneur.
5. Understand the Human anatomy and osteology.
6. Study of Cell structure, its organelles and their functions. To make the student understand the concept of cell and its activities.
7. To move the student to understand the concept of Immunity, Antigen, Antibody, Allergies and auto immune diseases.

8. The study of structure and functions of various mammalian organs.

9. Understand the Evolution of Heart, Brain and Kidneys in different groups of vertebrates.

10. To make student understand the concept of Diagnosis, Prevention, Control and treatment of diseases.

11. To make the student understand Environment, Habitat, Ecosystems, Greenhouse effect, Global warming, Acid rain, Ozone layer depletion, Solid waste management, Energy resources and conservation.

12. To study animal behaviour under natural conditions and viewing be as an evolutionary adaptive trait.

13. Apply concepts in applied ethology to interdiscipinaryproblems such as animal welfare assessment.

14. To make the student understand the concept of genes, Mendelian principles, Sex-linkage, Gene mutations, Chromosomes, Inheritance, Causes of genetic disorders and Eugenics.

15. Students understand the Recombinant DNA Technology. To equip the learner to use the tools and technique for project work. Applications of technology in biological field.

16.Study of development of Eggs, After fertilization, Understand the fundamental process in the embryonic development of animals, formation of the germ layers, role of organisers.

17.To understand how species evolve, Fossil formation, and Embrological evidences in organic evolution.

18. In Animal physiology, the objective of the course is to provide basic understanding of different physiological systems and their interaction to maintain homeostasis.

19. To understand the role of chemical messenger an hormones, whether they are endocrine or neural in origin.

20. Students understand various techniques used in Biology ie.,Microtechnique, Immuno-assay, Centrifugation, Chromatography, Autoradiography, Micrometry and endoscopy.

21. Inspire the students for persuing higher studies in Zoology and for becoming an Entrepreneur and also enable students to get employed in the biological research institutes, Educational institutes and in the various departments of State and Central Governement.

5. LEARNING OUTCOME

LO 1. At the end of the course, students will be familiar with the animal world that surrounds us.

LO 2. They will be able to understand the process of evolution and see how it progressed from simple unicellular cells to complex multicellular organisms.

LO 3. Students will be able to identify invertebrates and vertebrates and classify them up to the class level. They should be able to describe unique characters of different phyla, able to recognise life functions and the diversity.

LO 4. They will be able to use the evidence of comparative biology to explain how the theory of evolution offers the only scientific explanations for the unity and diversity of life on earth.

LO 5. They will be able to use example to explicate how descent with modifications has shaped animal morphology, physiology, life history and behavior.

LO 6. The general mechanism of cell division and their regulations will be understood. They will be acquainted with the membrane structure and compositions, transport and trafficking cell movement.

LO 7. The association between defect in the cell cycle, apoptosis and cancer biology will be the land mark towards understanding different human diseases.

LO 8. The course genetics will be able to explain the fundamentals of genetics and the mendelian laws, the concept of alleles, linkage and crossing over of genes.

LO 9. The course will open an avenue to be familiar with a variety of types of genetic data, gene mutations, gaint chromosomes and eugenics.

LO 10. Discuss the principle and applications of biotechnology, understand the steps involved in DNA technology.

LO 11. Understand the concept of immunity, allergy and auto immune diseases. Enable the student to get sufficient knowledge towards principles and applications of bioinstruments.

LO 12. The course histology make the student to understand the features of mammalian organs, concept of cell and their activities.

LO 13. The course environmental biology make the student to understand ecology and conservations of the environmental objectives. On successful completion of the subject the student should have understood ecosystem, energy flow, current environmental issues and uses and values of biodiversity.

LO 14. The course parasitology presents the diagnostics methods of various diseases. The student understand the concept of diagnostic methods.

LO 15. The course animal physiology will provide detailed knowledge on the various physiological organ system and their importance to the integrative functions of the body. The students will be able to compare and contrast endocrine and nervous control system.

LO 16. The course developmental biology will provide a broad area from embryology to developmental biology. The students will be able to understand the embryonic development, reproductive function and fertilization.