Programme: Ph. D (Zoology)

POGRAMME OUTCOMES (POs)

PO 1: Gain a thorough grounding in the fundamentals in different areas of Zoology such as ecology, biodiversity, entomology, developmental biology, applied zoology etc.

PO 2: Develop the skill of applying concepts and techniques used in animal sciences.

PO 3: Apply ethical principles in animal behaviour, wild life conservation etc.

PO 4: Effectively aware the society about human wildlife conflict.

PO 5: Develop an attitude to perform effectively and efficiently as a leader as well as a member of a team in a sustainable development.

PO 6: Ability to engage in lifelong learning.

PO 7: To integrate knowledge, skill and attitude that will sustain an environment of learning and creativity among the students.

PO 8: Exposure about museums, zoos, national parks, sanctuaries, apiary, diary, vermicomposts units and laboratories.

PO 9: Enabling students to be capable of making decisions at personal and professional level.

PO 10: Getting prepared for post graduate studies and other competitive exams in order to achieve success in their professional careers.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO 1: Students will be able to develop, demonstrate and disseminate the knowledge and skills to laymen about climate change, pollution, communicable diseases and biodiversity.

PSO 2: Students also acquire skills to work as animal trainers, animals care takers, conservationists, lab technicians, zookeeper, wildlife biologists and many more.

PSO 3: Students will be able to play roles of animal breeder, forensic experts, lab technicians etc. which will help learners to possess knowledge and other soft skills and to react aptly when confronted with critical or unethical decision making.

PSO 4: Students will learn modern techniques such as composite culture such as pisciculture, aquaculture, sericulture, lac culture, oyster culture etc. applying these skills in their future careers in Zoology and other applied fields.

PSO 5: Students will be able to develop and demonstrate knowledge of applied zoology in integrated farming system for sustainable development.

PSO 6: Students will gain thorough systematic and subject skills within various disciplines of entomology, parasitology, embryology, physiology, ecology and applied zoology (apairy, diary, vermiculture etc.).

PSO 7: Learners will be able to recognize the role of zoologist, animals and wild life educators, veterinarian, entomologist, parasitologist etc. which will help learners to possess knowledge and other soft skills.

PSO 8: Learners will acquire the skills like effective communication, decision - making, problem solving in day to day life affairs.

PSO 9: Learners will involve in various co-curricular activities to demonstrate relevancy of foundational and theoretical knowledge of their academic major and to gain practical exposures therein.

PSO 10: Apart from theoretical knowledge learners can also acquire practical skills to work as zoo keeper, wildlife educators, animal trainers, veterinarian and various sectors such as healthcare centres, Pharmaceutical companies, pathology labs, medical camps academic institutions etc.

Course	Course outcomes (COs)
	Ph. D Zoology
Research Methodology (ZOO-609)	**CO 1:** To equip the students about history, myths and ethnic practices and research process. **CO 2:** To know about how to write synopsis of research projects etc. **CO 3:** To know the importance of computer and informatics in research. **CO 4:** Students should be aware about the current status and future prospects of research
Tools and Techniques for Research in Zoology (ZOO-606)	**CO 1:** Students will be get knowledge about microscopy, its principle & applications along with the other techniques used in biochemistry and Microbiology. **CO 2:** Students will get knowledge about Chromatography, Electrophoresis their principle type and applications. Radioisotopes and main isotope techniques in biology.

	CO 3: Students will learn about histological techniques: Principles of tissue fixation, microtomy, staining, mounting and other parameters used in histochemistry. **CO 4:** Students will study various cell culture techniques: Culture media, essential components and Preparation, Cell viability testing and Polymerase chain reaction (PCR).
Advances in Parasitology (ZOO-601)	**CO 1:** Students will understand Pathogenesis due to protozoans and helminth parasites (animal and plant- parasitic nematodes). Basis of host cell parasite interactions with special reference to autoimmune response and pathogenesis of protozoan diseases in general. **CO 2:** Students will learn how to prepare in vitro culture of protozoan and helminth parasites in the laboratory. **CO 3:** Students will examine ecobiology of egg and larval forms in helminth parasites along with egg hatching mechanisms in these parasites. **CO 4:** It will also help the students to understand the effect of parasitism on the host and reaction of host in reponse to these parasites.
Advanced topics in Entomology (ZOO-602)	**CO 1:** To equip the students about insect pheromones and allelochemicals. **CO 2:** This course will felicitate the students about insect toxicology Bio-chemistry and behavioural Physiology. **CO 3:** Students will learn about type of nervous system, signal transmission and Diapause found in insects. **CO 4:** Students will learn about eco-friendly pest control systems such as Biological control and Integrated Pest Management (IPM) etc.
Special topics in Biochemistry ((ZOO-603)	**CO 1:** Understanding of covalent properties of proteins. **CO 2:** Proper understanding of protein structure and their folding. **CO 3:** Students will learn about enzyme kinetics. **CO 4:** Students will understand the importance of molecular biology and medical biochemistry.
Advanced topics in Cytogenetic and Molecular	**CO 1:** Learners can acquire knowledge on structural gnomics: genome sequencing, Chromosome maps, Physical Mapping of Genomes and use of genome maps in genetics analysis.

Genetics (ZOO-604)	**CO 2:** Learners can learn various cytogenetic techniques used in molecula biology. **CO 3:** Understanding of molecular tools used in biology. **CO 4:** Students will be able to understand evolutionary genetics and its role in modern context
Advanced topics in Physiology (605)	**CO 1:** Students will be able to understand stem cells and their role in myogenesis. **CO 2:** Understanding the concept of metabolic fuels and effects of exercise, training on muscle metabolism, anapleuroslis in muscle, muscle glutamine and oxidative stress. **CO 3:** Students will learn basics of smooth muscle excitation and contraction. **CO 4:** Students will understand calcium dependent activation of contractile mechinary in vertebrate smooth muscle.