Maratha Vidya Prasarak Samaj's

Karmaveer Shantarambapu Kondaji Wavare Arts, Science and Commerce College, CIDCO, Nashik

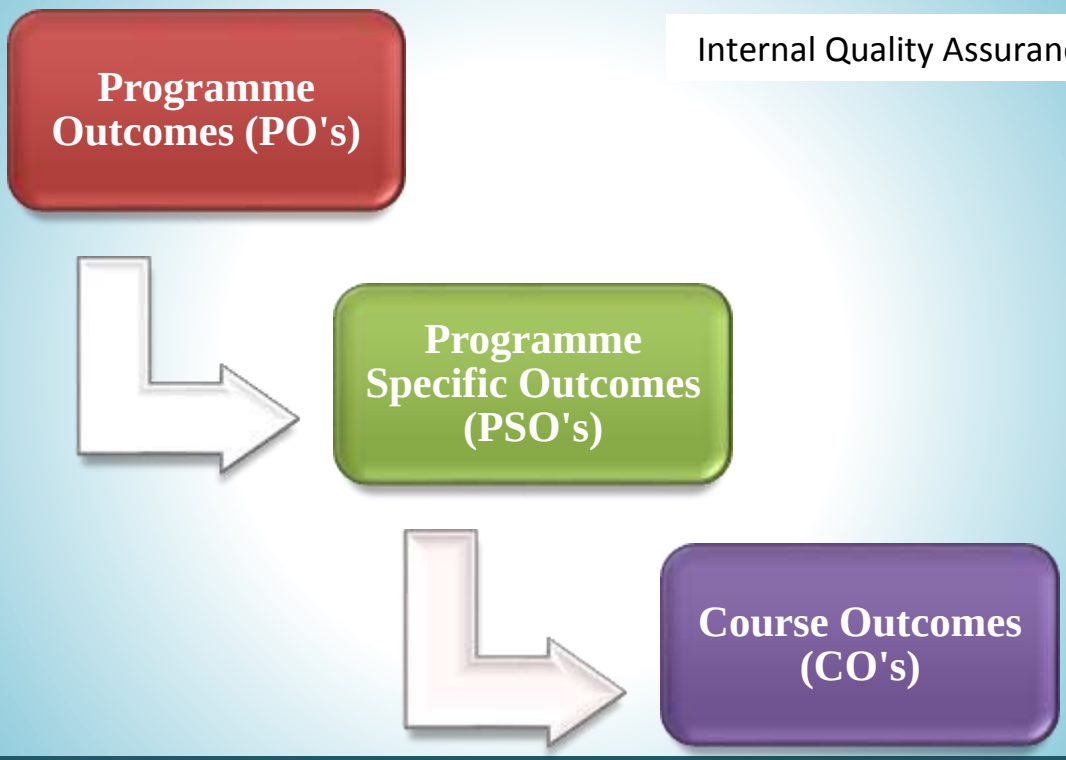
Uttamnagar, Nashik- 422 008 (Maharashtra)

Affiliated to Savitribai Phule Pune University Id. No. PU/NS/ASC/047/1993

AISHE C-42086 NAAC Re-accredited 'A' Grade (III Cycle 2017-22, CGPA 3.20)

Best College Award of Savitribai Phule Pune University Pune in 2009-10 and 2021-22

Internal Quality Assurance Cell



Syllabus: 2019 Pattern

Programme Outcome (PO's), Programme Specific Outcome (PSO's), Course Outcome (CO's)

Department: Zoology

Syllabus: 2019 Pattern

Programme Specific Outcome (B.Sc Zoology)

Program and Courses

Sr. No.	Name of the Programme	Year of introduction of programme	Duration of introduction of Programme
2	M. Sc. Zoology	2021-2022	2 Years

Programme Specific Outcome (M.Sc Zoology)

Sr. No.	Programme Specific Outcome (M.Sc Zoology)
PSO 1	Students will able to apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PSO 2	Students will understand the impact of the natural and anthropogenic activities in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development. Identify a range of invertebrates and vertebrates and justify their conservation.
PSO 3	Students will able to apply ethical principles and commit to professional ethics and responsibilities and norms of the work/research practice.
PSO 4	Students will understand the function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PSO 5	Students will able to communicate effectively on complex life activities with the scientific community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PSO 6	Students can demonstrate knowledge and understanding of Zoology and management principles and apply these to one's own work, as a member and leader in a team.
PSO 7	Students can recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Course outcome (M.Sc. Zoology)

Class	Subject code	Title	Cos:After successful completion of This course, student will be able to
	ZOUT 121	Molecular Biology and Bioinformatics.	CO 1: students will be able to explain the DNA structure & types, topology, Physical properties; chromatin structure and organization
			CO 2: Understand genome organization, DNA and Protein sequencing with their application in evolutionary studies.
			CO 3: Can explain the mobile DNA elements, mechanism of DNA damage and repair.
			CO 4: Can explain the process of DNA replication, transcription, translation and their Regulations, schematically represent the processes of central dogma.
	ZOUT 122	Endocrinology and Parasitology.	CO 1: Discuss the roles of Pituitary gland and pineal body and explain hormonal regulation of biomolecules and mineral metabolism.
			CO 2: Students can describe the role of parasites in public health and hygiene.
			CO 3: Can explain the morphology and life cycle of common parasites, the pathogenicity and control measures of common parasites, the process of parasitic infections to human.
			CO 4: Can explain the hormonal regulation of metabolism, the mechanism of hormone action and role of hormone receptors
			CO 5: Students can understand the terminologies of parasitology, concepts of animal association with examples.
			CO 6: Students can describe the role of parasites in public health and hygiene.
			CO 7: Can explain the role of hormones in moulting, change in body colour of crustaceans; yolk synthesis in amphibians; insect development.
			CO 8: Can understand the importance of control strategies against parasitic infections.
M.Sc Sem-II	ZOUT 123	Comparative Animal Physiology & Environmental Biology.	CO 1: Students will able to explain the physiology of processes like digestion, respiration, muscle contraction and excretion.
			CO 2: Can understand the mechanism of thermoregulation in both poikilotherms and homeotherms, the mechanism of chemical communication in vertebrates.
			CO 3: Can comment on the structure and functions of various sense organs.

Class	Subject code	Title	Cos:After successful completion of This course, student will be able to
			CO 4: Understand the survival strategies of organism in varied climatic conditions
			CO 5: Students can list the endangered, endemic and extinct animal species of India, illustrate the wildlife management practices and their significance
			CO 6: Students can identify various types of natural resources, human impact on these resources, and common resource management practices.
			CO 7: Understand concepts in population ecology and their significance, environmental hazards and risks and the socio-economic implications. .
	ZODT 124	Ichthyology	CO 1: Students can identify the common fishes in India and explain the general characters and evolution of fishes, the fish morphology and anatomical modifications.
			CO 2: Can understand the physiology of reproductive and endocrine organs in fish.
			CO 3: Understand the signs, symptoms and control measures of common diseases in fish.
			CO 4: Able to setup aquarium and manage it.
	ZOUP 125	Basic Zoology Lab-2	CO 1: Identify the various parasites and parasitic stages of common parasites, nitrogenous waste products of animals, freshwater planktons and slides of endocrine glands.
			CO 2: Explain the principle and significance of gonadectomy, thyrodectomy and pancreactomy.
			CO 3: Demonstrate the role of eye stalk and insulin in sugar level in crab.
			CO4: Demonstrate the retro cerebral complex in cockroach.
			CO5: Demonstrate the RBCs of common vertebrates and effect of various osmolarities.
			CO6: Determine the bleeding and clotting time, heartbeat of crab, species richness in selected area, physico- chemical properties of soil and water.
			CO7: Demonstrate the effect of body size, oxygen consumption and Insulin on aquatic animal.
			CO8: Perform Sterilization of lab equipment, prepare microbial culture, Isolate Bacterial, liver DNA and RNA from given sample, quantify and resolve them using electrophoretic procedures, analyse protein

Class	Subject code	Title	Cos:After successful completion of This course, student will be able to
			sample by PAGE and SDS PAGE and construct phylogenetic tree using tools in bioinformatics.
MSc Sem III	ZOUT 231	Animal Physiology- I (Special Paper)	CO1: Explain the membrane physiology and its dynamics.
			CO2: Explain the concept of nutrition and digestion.
			CO3: Explain the structure, contraction and types of contraction of muscle.
			CO4: Illustrate bioluminescence and animal electricity with examples and its significance
			CO5: Correlate the organisms Internal and external environments with homeostasis and biological clocks.
	ZOUT 232	Fundamentals of Systematics and Economic Zoology	CO1: Explain principles, methods of biological classification and diversity in kingdom Animalia.
			CO2: Explain the importance of taxonomic keys and taxonomic characters.
			CO3: Explain the principles of zoological classification and nomenclature
			CO4: Discuss the various taxonomic procedures and molecular phylogenetics & phylogeography.
			CO5: Illustrate the lac culture, apiculture, prawn culture, vermiculture, Poultry, dairy industry
			and Piggery.
			CO6: Explain the role of insects of economic importance.
			CO7: Explain parasitic roundworms of animal and plants.
			CO8: Signify the role of parasitic and soil protozoan in human welfare.
	ZOUT 233	Research Methodology and Insect Physiology and Biochemistry	CO1: demonstrate knowledge of research processes (reading, evaluating, and developing)
			CO2: perform literature reviews using print and online databases.
			CO3: select and define appropriate research problem and parameters to prepare a project proposal.
			CO4: identify, explain, compare, and prepare the key elements of a research proposal/report.
			CO5: compare and contrast quantitative and qualitative research paradigms
			CO6: Explain the structure, Chemistry of integument and sclerotization.

Class	Subject code	Title	Cos:After successful completion of This course, student will be able to
			CO7: Describe the process of digestion and metabolism
			CO8: Explain the characteristics of haemolymph and types of haemocytes.
			CO9: illustrate the structure, physiology and biochemistry of flight muscle.
			CO10: Demonstrate the process of excretion, detoxification and water balance
	ZODT 234	Immunology	CO1: List the primary and secondary immune organs.
			CO2: Explain the concepts of immunity, self-nonself immune response, autoimmune diseases
			CO3: Explain the theories of antibody synthesis and generation of antibody diversity.
			CO4: Explain the principle and application of the common techniques used in Immunology
			CO5: Illustrate the events and dynamics of inflammation
	ZOUP 235	Special Lab I	CO1: Demonstrate the effect of starvation on liver and muscle glycogen in given animal
			CO2: Demonstrate the effect of exercise on breathing, pulse rate and blood lactate level.
			CO3: Demonstrate the effect of pH, temperature and inhibitors on salivary amylase.
			CO4: Map the taste buds on human tongu
			CO5: Identify animals with the help of taxonomic keys.
			CO6: Collect and preserve animal samples using common methods.
			CO7: Write scientific report of field/ institutional visit.
			CO8: Compare the methods of collection and curation of insects.
			CO9: Identify the poultry breeds.
			CO10: Write the abstract, key words, result, discussion, conclusion and citations of references.
			CO11: Write a research project to seek funding.
			CO12: Conduct a scientific survey.
	ZODP 234	Zoology Practical Paper-3 (Immunology)	CO1: Identify the pattern of identity of antigen-antibody reaction.
			CO2: Identify the microscopic structure of the lymphoid organs.

Class	Subject code	Title	Cos:After successful completion of This course, student will be able to
			CO3: Demonstrate immunoelectrophoresis technique.
			CO4: Demonstrate the double diffusion techniques.
			CO5: Detect the human blood groups by antigen - antibody reactions
MSc Sem IV	ZOUT 241	Animal Physiology-II (Special Paper)	CO1: Explain the composition of blood, types of blood cells, vascular dynamics and clotting.
			CO2: Illustrate the anatomy and physiology of heart and cardiac cycle
			CO3: Describe the excretory system, nitrogenous wastes and renal regulation
			CO4: Illustrate the osmoregulatory mechanism in Invertebrates and Vertebrates
			CO5: Discuss the neuronal physiology and various potentials.
			CO6: Justify the location and structure of eye, ear and taste buds to their functions
	ZOUT 242	Mammalian Reproductive Physiology and Aquaculture	CO1: Explain the male and female reproductive systems and sexual dimorphic characteristics
			CO2: Explain the sexual cycles with examples
			CO3: Illustrate the reproductive dysfunctions.
			CO4: Diagrammatically represent the hormonal regulation of reproductive processes like
			CO5: Identify the fish diseases and the causative organisms
			CO6: Mention the various composite fish culture with significance of each type.
			CO3: Describe the methods of freshwater prawn culture and its management.
			CO4: Explain the methods of pearl culture and pearl harvesting.
			CO5: Illustrate the preparation and management of fish culture ponds.
	ZODT 243:	Pest Control	CO1: Explain the Pest, nature of damage caused by pests and pest control.
			CO2: Explain medical, veterinary, Household and stored grain pests.
			CO3: Explain the Principles and methods of pest control including Biological control measures.
			CO4: Explain the Integrated pest management (IPM)
			CO5: Explain the Non- insect pest and their control: Rat, Bandicoots, Crabs, Snails, Slugs, Birds and Squirrels.

Class	Subject code	Title	Cos:After successful completion of This course, student will be able to
	ZODP 243	Zoology Practical Paper- 4	CO1: Determine the bleeding and clotting time of human blood.
			CO2: Demonstrate the invertebrate heart.
			CO3:Calculate the heartbeats of Daphnia/Drosophila larva.
			CO4: Determine serum urea and protein and glucose in human blood and urine.
			CO5: Justify the effects of various physical and chemical factors on frog heart and muscle.
	ZODT 244:	Apiculture	CO1: Explain the basic concepts of apiculture like systematics, colony organization, polymorphism, morphology and foraging.
			CO2: Explain the tools and management of apiary.
			CO3: Explain the importance of institutions pertinent to apiculture.
			CO4: Discuss the setup of beekeeping business.
			CO5: Illustrate the bee keeping as occupation.
	ZODP 244	Zoology Practical Paper- 5	CO1: Identify the histological slides of reproductive organ/tissues.
			CO2: Explain the various types of placenta in mammals.
			CO3: Comment on merits and demerits of contraceptive devices/methods.
			CO4: Illustrate the technique of gonadectomy
			CO5: Identify Indian oysters.
			CO6: Identify the common freshwater fish used in culture farming.
			CO7: Demonstrate the processing and storing methods for fish and prawn.
			CO8: Test the freshness of fish/prawn by histological methods.
			CO9: Identify the honey bees
			CO10: explain the bee morphology and behaviour

HoD ,Zoology

IQAC Coordinator

IQAC

Principal
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