



Mahatma Gandhi Vidyamandir's

**Loknete Vyankatrao Hiray Arts, Science and Commerce College,
Panchavati, Nashik-422003**

(Affiliated to SPPU, Pune, Reaccredited with 'A' grade, Recipient of Best College Award by SPPU)

**Programme Specific Outcomes,
&
Course Outcomes of B.Sc.**

Department of Zoology

**Academic Year
2021-22**

Programme Specific Outcomes: B.Sc. Zoology(USZ)

Name of the Department: Subject	
Program Specific Outcomes	
At the end of the programme, student will be able to	
1	Understand the key concepts of Zoology at biochemical, molecular, cellular, physiological, histological and systematic level.
2	Understand recent trends in zoological sciences and their applications in various fields like agriculture, apiculture, fisheries, poultry, sericulture, bioinformatics etc.
3	Collect, analyse and explore biological data by statistical and biological techniques, write reports, review articles related to zoology
4	Enhancing their self-sustainability capabilities through understanding of skill-based information and techniques, culturing techniques of economically important animals in applied and classical zoology.
5	Assess environmental impact on all life forms, particularly on applied disciplines related to public health.
6	Understand and develop social competence including observational, listening, effective interactive skills and presenting skills to meet global competencies

Course Outcomes: B.Sc. Zoology(PSZ)

Class : F.Y.B.Sc		
Semester-I		
Paper	Course code & course title	At the end of the course, student will be able to
I	USZ (ZT-111) Animal Diversity I	Understand the terms related to animal diversity, classify and identify the diversity of animals.
		Demonstrate the structure and functions of spicules of sponges and classify the sponges on the basis of their skeleton.
		Define the systematic position and habitat of earthworms. Describe the body wall and coelom of earthworm and explain the structure and functions of their organ system.
		Recall the names of protozoan and helminths parasites of animals and illustrate their life cycles and pathogenicity
		Analyse invertebrates on the basis of their morphology and anatomy in respective systematic position.
		Carry out the field survey and write the field report on the basis of comparative morphology of animals.
II	USZ (ZT-112) Animal Ecology	Understand terms related to animal ecology and distribution of animals in different realms interaction
		Knows his role in nature as a protector, preserver and promoter of life which he has achieved by learning, observing and understanding life, wild life conservation and management
		Analyse the population & community ecology applicable to life sciences
		Describe the history, introduction and nature of ecosystem
		Explain the bio-geocycles and laws, understand environmental impact on it
		Develop understanding of aquatic ecology, wild life conservation and management
III	USZ (ZT-113) Zoology Practical Paper	Gain knowledge to identify and classify various animals based on morphological features
		Prepare the culture of Paramecium, for live observations of organelles, nutrition, locomotion, excretion, reproduction, fission etc
		Understand the principle, applications and use of microscopes and micrometry.
		Analyse invertebrate animals according to their class by morphology and anatomy
		Performed laboratory experiments blood cells as differential and total count with normal range
		Identify various larval stages and development in invertebrate groups.
Semester-II		
I) USZ (ZT-121) Animal Diversity II	Understand classify and identify the diversity of arthropod, Mollusca, Echinodermata by morphology and anatomy
		Identify various larval stages and development in insects, and echinoderms
		Understand various modifications in animal groups and the need of the modification for survival
		Know the differences and similarities in the various aspects of classification.
		Apply the underlying principles of classification of animals

		Analyse and explore animal diversity surround us by statistical and biological techniques, write reports
II	USZ (ZT-122) Cell Biology	Understand the importance of cell as a structural and functional unit of life.
		Compare between the prokaryotic and eukaryotic system and extrapolates the life to the aspect of development.
		Able to describe cell organelle structure and functions with inter relationship
		Apply their knowledge of cell biology to selected examples of changes or losses in cell function.
		Understand how these cellular components are used to generate and utilize energy in cells
		The fundamental of cell cycle and Apoptosis, difference between Somatic cell division and Gametic cell division
III	USZ (ZT-123) Zoology Practical Paper	Gain knowledge to identify and classify various arthropods, molluscs and echinoderms based on morphological features
		Understand the knowledge of mouth parts of insects, shell in molluscs
		Prepare vermicomposting bin preparation and maintenance
		Insect pest collection and its identification, preservation of it
		Write report of visit to a vermicomposting unit
		understand economic importance of honey bees, Lac insects silk worms, red cotton bug, Anopheles mosquito

Class : S.Y.B.Sc.		
Semester-III		
Paper	Course code & course title	At the end of the course, student will be able to
I	USZ (ZT-231) Animal Diversity III	Understand the terms related to Animal diversity, classify and identify the diversity of higher vertebrates.
		Aware regarding his role and responsibility towards nature as a protector, to understand his role as a trustee and conservator of life which he has achieved by learning, observing and understanding life.
		Understand the linkage among different groups of higher vertebrates
		Analyse and explore animal diversity surround us by statistical and biological techniques, write reports
		Identify reptiles, Pisces, amphibians by external morphology and anatomy
		Understand animal type study of fish with all systems, reproduction and life cycle
II	USZ (ZT-232) Applied Zoology I	Learn for controlling agricultural pests as need for more crop yield
		Understand the basic information about silk, silkworm rearing management
		Learn about rearing and life cycle of Mulberry, Tassar, Eri and Muga silk moths
		Identify and treat important diseases and pests of silkworm and use of Shoulder type Rotary duster, Knapsack sprayer for agricultural pests, Cynogas Pump.
		Know about preparation of cocoons for marketing and understand post harvesting methods

		Gain knowledge of biotechnological and biomedical applications of silk
III	USZ (ZT-233) Zoology Practical Paper	Prepare map showing distribution of silk moth and sericulture practices in India
		Gain knowledge of equipment's in Sericulture and methods of their use
		Explain the tools and techniques used in agricultural pest control including Rotary duster, Knapsack sprayer for agricultural pests, Cynogas Pump
		Illustrate management of the agricultural pests and sericulture units
		Gain knowledge to define the concepts of the applied subjects like Apiculture and Sericulture
		Select economically important species of Silk moth for sericulture unit
Semester-IV		
I	USZ (ZT-241) Animal Diversity IV	Understand the terms related to Animal diversity, classify and identify the diversity of higher vertebrates.
		classify vertebrates and to become able to understand the possible group of vertebrates observed in nature.
		Become aware regarding his role and responsibility towards nature as a protector, to understand his role as a trustee and conservator of life
		Understand Origin & Ancestry of Chordates
		Understand the linkage among different groups of higher vertebrates.
		Gain knowledge of Reptiles, Mammals and Pisces with animal type study of fish
II	USZ (ZT-242) Applied Zoology II	Learn for managing beehives for honey production and pollination as need for more crop yield
		Differentiate between different life stages of honey bee and explain their life cycle. Discuss control and prevention of pests and diseases.
		Outline the important tools and equipment's used in apiculture and fisheries.
		Understand knowledge of fish preservation technique, fish by-products
		Aware of principle and use of Crafts and Gears in Indian Fishery
		Understand Bee diseases, Bee pests and Bee predators, bee pollination
III	USZ (ZT-243) Zoology Practical Paper	Gain knowledge of equipment's in beekeeping, fisheries and methods of their use
		Learn about rearing and life cycle of honeybee
		Understand Freshwater fisheries, Marine fisheries, Brackish water fisheries.
		Aware of various harvesting methods of marine forms fisheries
		Understand knowledge of fish preservation technique, fish by-products
		Identify Bee diseases, Bee pests and Bee predators

Class: T. Y. B. Sc

Semester-V

Paper	Course code & course title	At the end of the course, student will be able to
I		To identify the pest and strategy for effective pest control.
		To understand differences between continuous pests, sporadic pests, and potential pests.

	USZ(ZT-351) - Pest Management	Student will be able to understand prevention, suppression, and eradication of pests
		To describe factors that contribute to pests evolving resistance to pest control strategies.
		To know what IPM is and why it is effective.
		To Distinguish positive and negative impacts of pesticide use.
	USZ(ZT-351) Histology	Understand basic terms related to histology and all four types of tissues
		Compare structural differences in digestive, respiratory, reproductive and organs of circulatory systems
		Distinguish the normal histology with altered organ structure in disease progression
		Outline the processes involved in the preparation of tissue sections and explain the purpose of each of these processes
		Develop skill in various histological staining techniques
		Identify sections of mammalian organs by its tissue layers, gross structure etc
	USZ(ZT-351)- Biological Chemistry	Understand concept of pH, buffer and water, its importance the biological system
		Analyse amino acids in Polar, non-polar, acidic basic and neutral amino acid groups
		Classify carbohydrates and demonstrate stereochemistry of carbohydrates and their properties
		Develop the knowledge to relate vitamins to the type of deficiency diseases and role of vitamins in metabolism.
		Differentiate structures of proteins, with examples and types of protein structures
		Classify lipids based on the structure, and functions
	USZ(ZT-351)- Genetics	To understand genes structure, chromosomes and the concept of Inheritance and Variations.
		To Demonstrate the Knowledge and practical skills of molecular genetic analysis of genetic diseases
		To know about the Classical and Modern genetics
		Student will be able to understand the concept of Mendelian genetics, gene, gene regulation and multiple alleles.
		To Identify genetic disorders based on Karyotypes and traits
		To Update current Knowledge regarding genetics, genomics, genomic medicine
	USZ(ZT-351)- Developmental Biology	Explain the principles and process of fertilization and cleavage
		Prepare the flow chart of gametogenesis process and Identify the developmental stages
		Understood the process of development and gametogenesis
		Understand the process of organogenesis of selected organs, development of extra embryonic membrane and the nature and physiology of placenta.
		Explain the theories of preformation, and concepts like growth, differentiation and reproduction
		Illustrate aspects and patterns of animal distribution.
	USZ(ZT-351)- Parasitology	Gain knowledge of basic terms and general concepts related parasitology
		Interpret the interactions between parasite with its host
		Explain the basic biology and lifecycle of parasites including epidemiology, diagnosis and treatment

		Recognize morphological characteristics for identification of parasites and their developmental stages
		Analyse the medical and public health aspects of human parasitic infections.
		Justify the control measures of arthropod vectors and Understand the importance of hygiene with respect to epidemic diseases.
	USZ(ZT-351- Zoology Practical Paper 1	Student will be able to analyse pest problems, to determine if management is necessary using IPM techniques.
		Student will be able to Describe characteristics of insect pests and factors that make them successful pests.
		To know different types of pesticides and to acquire information about the risks associated with the use of pesticides.
		To understand the structure & functions of various tissues in organ system.
		To know histological structure of various glands and its functions.
		To understand the histological aspects of mammalian organs.
	USZ(ZT-351- Zoology Practical Paper 2	To Explain the importance and applications of techniques used in biochemistry.
		To Explain the principle and applications of various chromatographic techniques with examples.
		To understand the importance of pH, buffer and water in living systems.
		Student will be able to understand how to Construct the pedigrees and analysis of pattern of inheritance in the families
		To describe the different methods of genetic testing.
		To demonstrate Knowledge and practical skills of molecular genetic analysis of genetic diseases.
	USZ(ZT-351- Zoology Practical Paper 3	Students will able to prepare chick embryo
		To know about blastula and gastrula stages of various embryo
		To study life cycle of various endoparasites.
		To study whole mount of chick embryo
		To understand parasite as vectors
		To know about the disease cause by various parasites.
	USZ(ZT-351- Aquarium Management	To be able to formulate fish food that provides with complete nutritional benefits.
		To comprehend the key skills needed to set up an aquarium
		To be able to identify and differentiate the different aquarium/ornamental fishes
		To analyse the required budget to set up a well-maintained home aquarium.
		students' knowledge about various techniques of ornamental fish breeding, rearing and its marketing to make them self-sustainable
		Students will learn Decorations of aquarium
	USZ(ZT-351- Poultry Management	The students will able to understand the poultry farming practices.
		Students will able to learn the poultry breeding techniques.
		Students will able to the poultry rearing techniques.
		Understand feeding requirement and food ingredients.
		To know about the poultry disease and their pathogens.
		Student will gain the knowledge of market value of poultry products.

Semester-VI		
Paper	Course code & course title	At the end of the course, student will be able to
	USZ(ZT-351)- Medical & Forensic Zoology	To understand the scope, need and History of Forensic Science.
		To provide a course of study in mammalian, principally human, systems physiology, building on knowledge of basic physiological principles
		To understand the various branches of Forensic Sciences from Life Sciences.
		To understand human physiology, post mortal investigations.
		To understand knowledge of handling different types of evidences and their examinations.
		Student will be able to describe the fundamental principles and functions of forensic science and its significance to human society.
	USZ(ZT-351) - Animal Physiology	To know various physiological organ-systems and their importance and functions of the human body.
		To know the concept of nutrition and digestion
		To understand Various aspects of Digestive physiology.
		Student will be able to understand the structure, contraction and types of contraction of muscle.
		To know the organisms Internal and external environments with homeostasis and biological Clocks.
		Student will be able to gain knowledge about the mechanism of different metabolic activities like Nutrition, Digestion, Respiration, Reproduction etc.
	USZ(ZT-351) - Molecular Biology	To gain an understanding of chemical and molecular processes that occurs in and between cells.
		To gain insight into the most significant molecular and cell-based methods used today to expand our understanding of biology.
		Students Will be able to design and implement experimental procedures using relevant techniques.
		The students will gain a basic understanding on human genetics and hereditary.
		The course has been devised to familiarize students with Molecular Biology which chiefly deals with interactions among various systems of the cell, including those between DNA, RNA and proteins and learning how these are regulated.
		Student will learn what are these chemical and physical mutagens; mutation caused by them and how they are repaired.
	USZ(ZT-351) - Entomology	To Understand scope of entomology
		The students will know about the insect ecology
		Students will understand insect metamorphosis
		Students will be able to understand the pest management
		Students know about the anatomy of the insects
		Students gain knowledge of diseases causing insects vectors.
		Thinking like a biologist
		Describing the breadth of the discipline

USZ(ZT-351) - Techniques in Biology	Using the tools and methods of modern biological research
	Synthesizing a range of biological concepts and ideas
	Developing critical thinking skills
	Communicating effectively, both orally and in writing
USZ(ZT-351) - Evolutionary Biology	Understand the theories of evolution and highlighted the role of evidences in support of evolution
	Explain the theories of organic evolution and the concept of origin of life and theories of origin of life
	Illustrate the presence of organisms at various geological time scale and evolution in man
	Apply the knowledge in relevant experimentations and Categorize different zoogeographical realms
	Compare animal distribution in different zoogeographical realms
	Described the evolutionary knowledge through the concepts of coloration and mimicry
USZ(ZT-351) - Zoology Practical Paper 1	To develop practical biological skills introduced in Physiology of Organisms.
	Students will be able to understand modern tools, techniques and skills in forensic investigations.
	To understand the advance technique in the field of Medical and Forensic Zoology.
	To Demonstrate the effect of pH, temperature and inhibitors on salivary amylase.
	To understand the Structure and functions of muscles
	Student will be able to know the mechanism of chemical communication in vertebrates.
USZ(ZT-351) - Zoology Practical Paper 2	Student's will able to prepare DNA paper model
	Student's will able to estimate DNA by diphenyl amine method
	To Principle & application of Spectrophotometer & PCR.
	Students will able to study Different types of head, legs and wings of insects
	Students will able to prepare temporary mounting of mouth parts, antenna legs and wings of insects.
	To understand general entomology, basic systematics, morphology, physiology, and biodiversity.
USZ(ZT-351) - Zoology Practical Paper 3	To understand techniques involved in understanding the immunological aspects of physiology and biological samples.
	To know concept of light, electromagnetic spectrum and its application in absorption spectroscopy.
	To understand principle and applications of various chromatographic techniques with examples.
	Students will be able to learn most of the essential aspects of Evolutionary Biology.
	To Apply evolutionary theory and concepts and to solve theoretical questions in evolutionary biology
	Student will be able to focus on the explanation of various theories of evolution comprising of Lamarckism, Darwinism and Neo-Darwinism.
	To know the concept of environment, Sustainable development and Exploitation

	ZO 3610 Environmental Impact Assessment	To Demonstrate a general understanding of the breadth and interdisciplinary nature of environmental issues.
		To provide the knowledge about the EIA and Processes involved in EIA.
		To Understand and evaluate the global scale of environmental problems.
		To understand different acts for Protection of Environment.
		To understand different types of Pollutions and different strategies to overcome the Pollution.
	USZ(ZT-351) - Environmental Impact Assessment	Illustrate importance of topic, material & Methods and reference work for research project
		Write effective scientific and technical communication based on the project
		Design experimentation to prove the hypothesis
		Represent interpretations of research data within scientific and technical communities.
		Collect data, analyse and interpret it by field visits
		Understand research presentation, preparation of research article, reference work etc.

Head, Department of Zoology