

CO-PO-PSO Mapping Zoology

UG																	Average mapping strength
Course Code	Course Name	COs	CO Description	PO						Average mapping strength	PSO					Average mapping strength	
				1	2	3	4	5	6		1	2	3	4	5		
Semester I																	
UGZOCC 01	NON-CHORDATES I: PROTISTS TO PSEUDOCOELOMATES	CO 1:	Describe the protozoan reproduction, polymorphism in cnidarians, nervous system in molluscs	3						2.8	2					2.6	
		CO 2:	Apply and evaluate the biological and medicinal importance of various larvae and sponges respectively			3					3						
		CO 3:	Understand the invertebrate defence and feeding mechanisms		3									3			
		CO 4:	Analyse and discuss the adaptive radiation, evolution, affinities of a variety of invertebrates				3										
		CO 5:	Acquire skills in teaching the structural and functional features of invertebrate animal life's diversity						2					2			
UGZOCC 02	PRINCIPLES OF ECOLOGY	CO 1:	Define and demonstrate the components and characteristics of population, community and the ecosystem	3	3					3	3		2			2.83	
		CO 2:	Analyze, apply and evaluate the various concepts of population and community and relate the impact of man on the ecological balance				3						3				
		CO 3:	Interpret and analyse the importance of biodiversity and its conservation management				3						3				
		CO 4:	Demonstrate and evaluate the interactions among various environmental parameters		3								3				
		CO 5:	Demonstrate and recommend environmental ethics related issues and management strategies.						3				3				
Semester II																	
UGZOCC 03	NON-CHORDATES II: COELOMATES	CO 1:	Demonstrate and distinguish different coelomate invertebrates and the structural and functional biology of these taxonomic categories		3					2.87	3					2.86	
		CO 2:	Illustrate different vector born diseases and the related life cycles, epidemiology, pathology, diagnosis, symptoms and treatments and take part in controlling these diseases	3	3									2			
		CO 3:	Define, interpret and analyse the adaptive radiation, evolution and affinities of a variety of coelomates			3						3					
		CO 4:	Demonstrate and apply various techniques of sericulture, apiculture, lac culture and pearl culture. Thus create the entrepreneurship.					3	3				3	3			
		CO 5:	Compare and apply the compound vision in arthropods			3			2			3			3		
UGZOCC 04	CELL BIOLOGY	CO 1:	Define and demonstrate the structures and functions of plasma membrane and all cellular organelles in details.		3	3				3		3			3	3	
		CO 2:	Illustrate the structure and functions of endomembrane system and cytoskeleton		3							3					
		CO 3:	Demonstrate and identify the detail structure of nucleus and compare the functional mechanism of different parts of the nucleus.		3							3					
		CO 4:	Elaborate the mechanism of cell signalling and cancers.		3							3					
		CO 5:	Compare and apply the techniques to measure and stain different cell types.		3				3			3		3			
Semester III																	
C 05	Y OF IATA	CO 1:	Define and classify different class of chordates.	3	3							3					
		CO 2:	Demonstrate and compare the structure, function and biology of chordates of different taxonomic classes.		3							2	3				

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				1	2	3	4	5	6		1	2	3	4	5	
UGZOOC	DIVERSITY OF CHORDATA	CO 3:	Outline and evaluate the origin of chordates		3					3	3					2.86
		CO 4:	Illustrate and analyse some special topics like zoogeography, metamorphosis, snake bites, migration of birds, parental care of amphibian, echolocation of mammals.		3						3					
		CO 5:	Apply the knowledge of poultry managements and different breeds of domestic animals to build animal husbandary.					3			3					
UGZOCC 06	ANIMAL PHYSIOLOGY : CONTROLLING AND COORDINATING SYSTEMS	CO 1:	Define and demonstrate the basics of histology and functions of various tissues.	3	3					2.67		3				3
		CO 2:	Illustrate the structure and physiology of muscles, nerves.		3							3				
		CO 3:	Explain the reproductive systems and distinguish the physiology of male and female reproduction.		3		2					3				
		CO 4:	Demonstrate and evaluate the histology of endocrine glands.		3			3				3			3	
		CO 5:	Classify hormones and Explain their biosynthesis, receptors, mode of molecular actions, physiological function, feedback controls and related disorders.					2						3	3	
		CO 6:	Examine histology different tissues through preparation of temporary and perantent slides						2			3		3		
Semester IV																
UGZOCC 07	FUNDAMENTALS OF BIOCHEMISTRY	CO 1:	Define and demonstrate the basic and fundamental biochemistry of carbohydrates, proteins, lipids and nucleic acids.	3						2.87		3				3
		CO 2:	Understand and apply the nature, mechanism, and kinetics of enzyme action.		3		2					3				
		CO 3:	Demonstrate, apply and evaluate some instrumentation such as microscopy, chromatography, electrophoresis, centrifugation, spectrophotometry etc.		3		3	3				3				
		CO 4:	Analyse and estimate pH, carbohydrates, proteins, lipids and chromatographic separation of amino acids				3		3			3			3	
UGZOCC 08	COMPARATIVE ANATOMY OF VERTEBRATES	CO 1:	Define, demonstrate and compare the structures of different systems such as, integumentary, skeletal, digestive, respiratory, circulatory, urinogenital, nervous and sensory organs in the vertebrate groups.	3	3				3	3	3	3				3
		CO 2:	compare the disarticulated skeleton of many vertebrates.				3				3	3				
		CO 3:	Demonstrate and identify the skeletal modifications in vertebrates.		3						3	3				
		CO 4:	Discuss the evolution of urinogenital ducts, heart and aortic arches.		3			3			3				3	
UGZOCC 09	ANIMAL PHYSIOLOGY : LIFE SUSTAINING SYSTEMS	CO 1:	Define and illustrate the physiology of digestion, absorptions and hormonal control of enzyme secretion	3	3					3	3					3
		CO 2:	Demonstrate the respiratory system and is mechanism		3							3				
		CO 3:	Explain the mechanisms of circulation and excretion				3								3	
		CO 4:	Understand and analyse the adaptational Physiology.			3		3				3			3	
		CO 5:	Compare and analyse the histology of different tissue, determine ABO Blood group, and examine red blood cells, white blood, haemoglobin and blood pressure				3	3				3			3	
Semester V																
UGZOCC 10	BIOCHEMISTRY OF METABOLIC PROCESSES	CO 1:	Define and explain the basic mechanisms and pathway of metabolism.	3	3					2.78		3				3
		CO 2:	Demonstrate and compare the metabolism of carbohydrates, lipids and proteins in details.		3			3				3				
		CO 3:	Illustrate and experiment the oxidative phosphorylation and redox reactions.		3				3			3			3	
		CO 4:	Estimate total protein and evaluate SGOT and SGPT or GST and GSH in serum/ tissue.		3			3				3			3	

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				1	2	3	4	5	6		1	2	3	4	5		
UGZOCC 11	MOLECULAR BIOLOGY	CO 5:	Explain the enzymatic activity.					1		2.9		3				2.9	
		CO 1:	Define and illustrate the replication, transcription, translation.	3	3							3					
		CO 2:	Demonstrate the post transcriptional and post translational modifications, gene regulation, DNA repair mechanisms and		3							3					
		CO 3:	Demonstrate and apply various molecular tools and techniques like PCR, southern, northern and western blotting, recombinant DNA technology etc.		3		2					3		2			
		CO 4:	Elaborate various tools and techniques related to bacterial microbiology and apply some aspects of applied microbiology and diseases related to microbiology.				3	3				3		3			
		CO 5:	Prepare bacterial culture and examine bacterial growth.					3	3			3			3		
UGZOCC 12	PRINCIPLES OF GENETICS	CO 6:	Estimate of DNA and RNA					3		3		3			3	2.75	
		CO 1:	Define and explain fundamental genetics like Mendelian and Non Mendelian inheritances, linkages, mutations.	3	3							3			3		
		CO 2:	Demonstrate sex determination of various animals, extrachromosomal inheritances, transposable genetic elements etc.		3							3			1		
		CO 3:	Illustrate and compare various aspects of human genetics by covering chromosomal aberrations, gene mutation, etc..		3		3					3			3		
		CO 4:	Apply and evaluate various aspects of biostatistics such as central tendency, t-test, chi-square, ANOVA, correlations and regression.					3	3					3	3		
Semester VI																	
UGZOCC 13	DEVELOPMENTAL BIOLOGY	CO 5:	Test the Mendelian laws and gene interactions, draw linkage maps and examine chromosomes.					3		3					3	3	
		CO 1:	Define and demonstrate the historical perspective and basic concepts of developmental biology	3	3								3				
		CO 2:	Explain and compare the different aspects of early, late and post embryonic developments.		3			3					3				
		CO 3:	Apply and adapt the knowledge of developmental biology in various fields, such as in teratogenesis, stem cell biology, in vitro fertilization, cryopreservation, cord blood transfusion etc.				3	3				3			3		
		CO 4:	Inspect the developmental stages, different sections of placenta, .						3				3				
UGZOCC 14	EVOLUTIONARY BIOLOGY	CO 5:	Compose study report on Drosophila culture and chick embryonic development					3		2.54		3				2.54	
		CO 1:	Learn various evolutionary concepts and historical perspective about evolution.				3		3						3		
		CO 2:	Understand the importance and implication of the evidences of evolution.		2												
		CO 3:	Understand the population genetics and evaluate the evolutionary forces and its impact.		2	3							1				
		CO 4:	Understand the origin and evolution of man and draw phylogenetic trees		3			1				3	2				
		CO 5:	Learn various evolutionary concepts and historical perspective about evolution.		3				3			3		3			
Semester V (DSE)																	
DSE 01	OLOGY	CO 6:	Understand the importance and implication of the evidences of evolution.	3	3							3			3		
		CO 1:	Define and demonstrate the structures and function of immune cells, immunoglobulins, antigens and their interactions with antibodies.		3									1			
					3							3					

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UGZOC	IMMUNOLOGY	CO 3:	Compare and elaborate the cellular immune response		3			3	3	3		3			3	2.8
		CO 4:	Understand and identify the histology of spleen, thymus and lymph nodes and analyse the bloodcells, blood groups and immune reactions		3		3					3		2		
		CO 5:	Demonstrate and apply immune diffusion technique and ELISA		3	3						3		2		
UGZOODSE 02	Animal Behavior and Chronobiology	CO 1:	Define and demonstrate the details about patterns of behaviours, survival strategies, social and identify the cooperative behaviours.	3	3	3				3	3		2			2.87
		CO 2:	Explain the design of signals and analyse its application in ecology and evolution		3	3		3			3		3			
		CO 3:	Illustrate and evaluate the chronobiology			3		3			3		3			
		CO 4:	Compare nesting habits of animals, analyse the ethogram and prepare a short report on behavioural activities of animals					3	3		3			3		
UGZOODSE 03	POLLINATION BIOLOGY	CO 1:	Define, demonstrate and apply the knowledge about flowering of plants in natural environment and its relation with pollination, and above all ecological impact.	3	3	3				3	3		2			2.9
		CO 2:	Illustrate and evaluate the basic principle and modes of pollination, types and identification of flower visitors, pollinator diseases, colour vision capabilities of insect pollinators.			3					3		3		3	
		CO 3:	Explain and analyse the importance of pollination and threats to pollinators and conservation of pollinators					3	3		3		3	3		
		CO 4:	Demonstrate and analyse Gymnosperms & Angiosperms pollination systems													
		CO 5:	Evaluate and prepare report on the relationship between the flowering plants and mouthparts of the pollinating insects			3			3		3	3			3	
UGZOODSE 04	PROJECT WORK (BIOINFORMATICS AND)	CO 1:	Define and demonstrate the basic concepts in bioinformatics and molecular biology.	3	3					3		3				3
		CO 2:	Apply various bioinformatics tools, analyse and interpret various biological data.		3		3					3				
		CO 3:	Identify research questions and design insilico experiments				3	3				3		3		
		CO 4:	Perform and solve the research problems.					3	3			3			3	
		CO 5:	Discuss the results and prepare scientific reports.						3			3			3	
Semester VI (DSE)																
UGZOODSE 05	BIODIVERSITY AND WILD LIFE CONSERVATION	CO 1:	Define and understand the various issues related to biodiversity loss and conservation as well as status, conditions and conservation of forests and wildlife.	3	3					3			1			2.29
		CO 2:	Understand and apply the various tools used in field biology			3							2		1	
		CO 3:	Compare and evaluate the pitfall/ trail / transect monitoring for abundance and diversity estimation				3						3		3	
		CO 4:	Prepare on complete report on excursion or field visit.						3				3		3	
UGZOODSE 06	COMPUTATIONAL BIOLOGY	CO 1:	Define and explain the importance, goal and scope of bioinformatics	3	3					2.89		3				2.71
		CO 2:	Illustrate, inspect and apply the biological databases to retrieve biological data			3	3					3				
		CO 3:	Demonstrate and apply the basic concept of sequence alignment.			3						3				
		CO 4:	Demonstrate and apply the tools in bioinformatics and biostatistics			3			2			3			1	
		CO 5:	Construct the graphical representations of statistical data.			3			3			3			3	
GENERIC ELECTIVES (GE)																
GE01	GENERAL SCIENCE	CO 1:	Define and demonstrate the general characters and special structures in different animal groups.	3								3				

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				1	2	3	4	5	6		1	2	3	4	5		
UGZOO001	ANIMAL DIVERSITY AND SYSTEM	CO 2:	Demonstrate and apply the taxonomy and classifications of animals.							2.8						2.8	
		CO 3:	Define, demonstrate and illustrate the basic endocrinology and histology of animals.		3							3	3				
		CO 4:	Define, demonstrate and illustrate the basics of developmental biology in animals.					3									
UGZOOGE02	ECOLOGY, ECONOMIC AND MEDICAL ZOOLOGY	CO 1:	Define, demonstrate and apply the definition, principle and scope of fisheries and aquaculture, lac culture and pest management		3	2				2.86		3				2.8	
		CO 2:	Illustrate, analyse and evaluate the concept of ecology, biodiversity and wildlife conservation.	3							2		3				2
		CO 3:	Define, demonstrate and apply the concept of parasitism and evaluate the life history, pathogenicity and clinical features of selected parasites.	3		3							3	3			
		CO 4:	Define and understand the basic principles of biotechnology and immunology.								3				3		2
		CO 5:	Define, demonstrate and apply the concept of biotechnology and immunology.	3				3					3				
UGZOOGE03	BIOTECHNOLOGY: MICROBES TO ANIMALS	CO 1:	Define, demonstrate and apply the concept of biotechnology.	3					3	3		3				2.71	
		CO 2:	Demonstrate and analysing the techniques in gene manipulation	3								3					
		CO 3:	Demonstrate and evaluate the application of microbes in biotechnology		3							3					
		CO 4:	Define, demonstrate and evaluate the method of transgenic animal production.		3	3						3					
		CO 5:	Extend the basic concept in biotechnology and human welfare and perform experiments.				3		3				3	3			
UGZOOGE04	INSECT, VECTORS AND DISEASES	CO 1:	Define, demonstrate the characteristic and morphological features of Insects.	3						2.8						2.83	
		CO 2:	Illustrate and evaluate the insects as vectors.		3	3							3	3			
		CO 3:	Demonstrate and analyse different vectors of different orders.				3							3			
		CO 4:	Demonstrate, identify and prepare report on different vectors and their associated diseases.								2	3					2
SKILL ENHANCEMENT COURSE (SEC)																	
UGZOOSEC01	Value Education and Indian Culture	CO 1:	Define, understand and apply the daily routine, self-evaluation & Integral Personality Development	3						3					3	3	
		CO 2:	Learn, and apply the Power of thoughts & the Science of Peace			3									3		
		CO 3:	Understand the relation: Values and enlightened citizenship		3										3		
		CO 4:	Discuss the awareness about the Indian Practice and Culture												3		
		CO 5:	Demonstrate and practice the Four Yogas						3						3		
		CO 6:	Explain and analyse the idea about Modern India: her hopes, challenges and Swami Vivekananda						3						3		
UGZOOSEC02	Spoken Tutorial on CellDesigner	CO 1:	Recall how to install and use the CellDesigner programme						3	3					3	2.92	
		CO 2:	Build gene-regulatory and biochemical networks by CellDesigner, a structured diagram editor.					3				3			2		
		CO 3:	Design models of biochemical reaction networks in Computer-readable format.					3				3			3		
		CO 4:	Analyze simulation and other analysis packages.					3	3			3			3		
		CO 5:	Relate data representation with various pictorial representations.					3	3			3			3		
		CO 6:	Browse and modify existing SBML models with references to existing databases, simulate and view the dynamics through an Intuitive graphical interface.					3	3						3		
		CO 7:	Define, demonstrate and apply the daily routine, self-evaluation & Integral Personality Development	3													3
AECC																	
01	Education	CO 1:	Enhance their English language proficiency in the aspects of reading, writing, listening and speaking.	3	3	3										3	

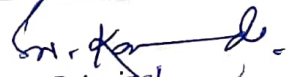
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				1	2	3	4	5	6		1	2	3	4	5	
UGZ00AECC	English Communication	CO 2:	Develop academic literacy required for undergraduate learning, further studies and research	3	3	3				3					3	2.8
		CO 3:	Apply the requisite communicative skills and strategies to future careers	3	3	3									3	
		CO 4:	Gain an insight into cultural literacy and cross-cultural awareness and engage in self-directed English language learning			3		3							3	
		CO 5:	Be responsible and ethical English users			3		3							2	
UGAECC02	ENVIRONMENTAL SCIENCE (ENVS)	CO 1:	Define and demonstrate the concept, components and function of natural resources and ecosystems.	3						3			3			2.83
		CO 2:	Define, illustrate and analyse the cause, effects and control measures of various environmental pollutants.			3							3			
		CO 3:	Demonstrate the basic idea about the disasters and its management.			3							3			
		CO 4:	Illustrate and apply the knowledge about the social, environmental issues and environmental legislation.				3						3			
		CO 5:	Define, demonstrate and evaluate the impact of human population on the Environment						3				3		2	

Grand average (PO) = 2.92.

Grand Average (PSO) = 2.84.


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				MSC					PO				Average mapping strength	PSO					Average mapping strength
Course Code	Course Name	COs	CO Description	1	2	3	4	1	2	3	4	5							
Semester I																			
PGZOCC 1.1	Diversity and Biology of Nonchordate	CO 1:	Describe the protozoan reproduction, polymorphism in cnidarians, nervous system in molluscs	3				2.83	3					2.67					
		CO 2:	Apply the biological and medicinal importance of various larvae and sponges respectively			3			3										
		CO 3:	Demonstrate the invertebrate defence and feeding mechanisms	3					2										
		CO 4:	Analyse and discuss the adaptive radiation, evolution, affinities of a variety of invertebrates	3					3			3							
		CO 5:	Compare and apply the compound vision in arthropods, insect flight mechanism	3					3			3							
		CO 6:	Acquire skills in teaching about the structural and functional features of invertebrate animal life's diversity	2							2	2							
PGZOCC 1.2	Diversity and Biology of Chordates	CO 1:	Describe the characteristic features and explain the affinities of Protochordata (Hemichordata Urochordata, Cephalochordata), Cyclostomes, Dipnoi	3				3	3					2.87					
		CO 2:	Demonstrate and evaluate the origin of birds and mammals		3				3	3									
		CO 3:	Demonstrate and analyse the Skeletal system and its functional and evolutionary significance		3	3			3			2							
		CO 4:	Demonstrate and apply the Circulatory systems, Nervous system and Sense organ				3		3			3							
		CO 5:	Analyse and discuss structural adaptation of different vertebrates	3					3										
PGZOCC 1.3	Cell biology & Instrumentations	CO 1:	Explain, analyse and apply the buffer systems					3						2.75					
		CO 2:	Define, explain and apply centrifugation, spectrophotometry, electrophoresis & blotting and microscopy.	3		3					2	2							
		CO 3:	Demonstrate the cell membrane and demonstrate and evaluate cell transport mechanisms.	3					3		3								
		CO 4:	Define and demonstrate the structure and function of cellular organelles	3					3			3							
		CO 5:	Demonstrate, apply and discuss the cell signalling system.				3		3										
PGZOCC 1.4	Genetics	CO 1:	Define and explain the chromosome structure and its metabolic pathways	3				2.83	3					2.8					
		CO 2:	Demonstrate and apply the concept of crossing over & linkage to construct gene map			3						3							
		CO 3:	Demonstrate and evaluate the mechanism of gene mutation and DNA repair			3			3			3							
		CO 4:	Explain and discuss cause of epigenetic modifications		3				3		3	3							
		CO 5:	Define, Demonstrate and analyse human karyotyping and chromosomal disorders	3			2		3			2							
PGZOCC 1.5	Structures & Systems of organisms	CO 1:	Develop knowledge on dissection of various organ and systems in animals and analyse the correlation	3				3	3		3			2.9					
		CO 2:	Demonstrate, apply and design the hypophysectomy technique		3	3	3		3		3								
		CO 3:	Explain, evaluate and design the aquaculture farm operation.			3	3		3		3								


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PGZ	Strucy o	CO 4:	Define and illustrate the process of collection, preservation and identification of museum specimens	3					3	2	3			
PGZOOCC 1.6	Tools & techniques in biological study	CO 1:	Analyse and estimate protein and nucleic acids using spectrophotometric techniques		3			3			3		3	3
		CO 2:	Analyse the adulteration and estimate the insulin using HPLC and ELISA respectively		3					3	3			
		CO 3:	Discuss and compare chromosome structure in man and drosophila		3		3			3	3			
		CO 4:	Analyse, evaluate and construct the pedigree		3		3			3				
		CO 5:	Apply and estimate the Hardy Weinberg law in population dynamics study		3	3				3				
		CO 6:	Evaluate the extrachromosomal DNA through DNA preparation, purification and gel ectrophoresis.			3				3	3			
PGZOO SOC 1	Yoga	CO 1:	Define, demonstrate and apply general awareness about health	3			3	3	3				3	2.67
		CO 2:	Learn and apply how to manage life style of students' life			3						2		
		CO 3:	Discover and apply how to increase concentration	3								2		
		CO 4:	Demonstrate and improve the decision-making capacity				3					3		
		CO 5:	Build up confidence in their life				3					3		
Semester II														
PGZOOCC 2.1	Biochemistry & Metabolism	CO 1:	Define, explain and evaluate the molecular conformations and interactions of carbohydrates, proteins, lipids and nucleic acids				3	3	3				3	2.87
		CO 2:	Demonstrate and apply the law of thermodynamics in biophysical chemistry	3	3				3		2			
		CO 3:	Demonstrate, evaluate and analyse the different metabolic pathways			3			3		3			
		CO 4:	Demonstrate, apply and discuss the synthesis of fatty acids and nucleic acids				3		3			3		
PGZOOCC 2.2	Molecular Biology & Biotechnology	CO 1:	Define, Demonstrate and analyse the mechanisms and regulation of replication, transcription and translation	3				3	3		3			3
		CO 2:	Demonstrate and apply the gene regulation, gene silencing and non-coding RNAs interference for drug development	3		3			3		3			
		CO 3:	Demonstrate, evaluate and discuss the importance of transposable elements and microbial genetics	3		3			3		3	3		
		CO 4:	Explain, adapt and apply different genetic engineering tools	3		3			3		3			
		CO 5:	Demonstrate the mechanism of cancer formation and access the role of carcinogens	3					3		3			
		CO 6:	Demonstrate and apply the transgenic organisms production and ethical issues	3			3		3	3	3			
PGZOOCC 2.3	Ethology & Chronobiology	CO 1:	Define, Demonstrate and analyse the various types of social organization in animals	3		3		3	3	2				2.82
		CO 2:	Demonstrate and apply the animal's communications system in resource exploration and discuss the significance	3		3			3	3			3	
		CO 3:	Demonstrate, analyse and apply the learning behaviours in animals			3			3				2	
		CO 4:	Demonstrate and evaluate the migration and defence systems in animals	3		3			3	3				
		CO 5:	Demonstrate, analyse and discuss the development of behaviour and biological rhythms and chronobiology in animals and human	3			3		3				3	
		CO 1:	Demonstrate, analyse and design models in the population and community ecology	3			3			3			3	

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				1	2	3	4		1	2	3	4	5		
PGZOCC 2.4	Ecological Sciences	CO 2:	Define, Demonstrate, and apply the ecosystem concepts and theory in different ecosystems	3		3		2.90		2			2	2.60	
		CO 3:	Explain, evaluate and apply the riverine ecosystem composition, interactions and impact	3		3	2			2			2		
		CO 4:	Demonstrate, apply and formulate the riverine ecosystem pollution management strategy	3			3			3			3		
		CO 5:	Demonstrate, evaluate and adapt the wetland biodiversity and pollution management	3			3			3			3		
PGZOCC 2.5	Biochemical and molecular aspects of life	CO 1:	Analyse, evaluate and estimate glucose, lipids and lipid peroxidation products		3			3				3	3	2.81	
		CO 2:	Evaluate and examine of oxidative stress enzymes and redox cycle enzymes		3							3	3		
		CO 3:	Identify and evaluate the quaternary haemoglobin protein		3							3			
		CO 4:	Construct the gene clone and evaluate gene expression		3		3					3	3		
		CO 5:	Apply the cell culture lab protocols and maintain cell culture		3		3					2	2		
		CO 6:	Identify, analyse and solve DNA sequence		3		3					3	3		
PGZOCC 2.6	Ethological & Ecological studies	CO 1:	Analyse, evaluate and apply the nesting behaviour of birds			3		3		3	3			3	
		CO 2:	Demonstrate, analyse and evaluate the FAP and aggressive behaviour in fishes and birds	3		3				3	3				
		CO 3:	Analyse and prepare report and documentary on field visit			3	3			3			3		
		CO 4:	Perform toxicity test, physicochemical parameters of water and soil		3	3				3			3		
		CO 5:	Apply, analyse and adapt the knowledge of population ecology to solve ecological problems		3	3	3			3			3		
PGZOOSOC 2	Communicative English	CO 1:	Enhance their English language proficiency in the aspects of reading, writing, listening and speaking.			3		3					2	2.4	
		CO 2:	Develop academic literacy required for undergraduate learning, further studies and research			3							3		
		CO 3:	Apply the requisite communicative skills and strategies to future careers			3							2		
		CO 4:	Gain an insight into cultural literacy and cross-cultural awareness and engage in self-directed English language learning			3							3		
		CO 5:	Be responsible and ethical English users			3							2		
Semester III															
PGZOCC 3.1	Parasitology and Immunology	CO 1:	Define, explain and analyse the parasites detection, diagnosis, prophylaxis and host parasite interactions	3		3		3					2	2.56	
		CO 2:	Demonstrate and apply the mechanisms of innate immunity	3		3							2		2
		CO 3:	Illustrate, analyse and discuss the importance of immunogens, antigens, cytokines, immunoglobulins and different immune cells and their functions	3			3						3		3
		CO 4:	Demonstrate and apply the hypersensitivity reactions, Immunological tolerance, autoimmunity and diseases	3									2		
		CO 5:	Explain and apply the knowledge on immunological mechanisms of infectious and noncommunicable disease formation	3		3							3		3

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Course Code	Course Name	COs	CO Description	PO				Average mapping strength	PSO					Average mapping strength
				1	2	3	4		1	2	3	4	5	
PGZOCC 3.2	Developmental biology and Neurobiology	CO 6:	Demonstrate and explain the basic idea about organ transplantation and vaccination	3								3		
		CO 1:	Define, Demonstrate and analyse the mechanisms of early developmental processes and morphogenetic movements	3	3				3			2		2.82
		CO 2:	Demonstrate and analyse the cellular and molecular aspects of regenerative biology and stem cell	3	3				3			2		
		CO 3:	Explain the nervous system organization and brain structure through imaging	3					3			3		
		CO 4:	Demonstrate, apply and analyse the nerve impulse transmission	3	3	3			3			3		
		CO 5:	Demonstrate the brain aging and various neuropathological diseases	3					3			3	3	
PGZOCC 3.3	Endocrine physiology	CO 1:	Define, demonstrate and explain the role of receptors, and signalling pathways, and feedback mechanisms in hormone action	3									3	3
		CO 2:	Explain and evaluate the role of hormone in cancers, endocrine disorders, stress and obesity disorders	3			3		3				3	
		CO 3:	Demonstrate, apply and discuss the hormonal regulation of male & female reproductive systems.	3									3	
		CO 4:	Explain the structure, biosynthesis and functions of melatonin and Prostaglandins	3			3		3				3	
		CO 5:	Illustrate and discuss the reproductive disorders endocrine disruptions	3					3				3	
PGZOE 3.1A	Elective paper 1A (Entomology)	CO 1:	Define, demonstrate, and explain insect biology, including general entomology, basic systematics, morphology, physiology, and biodiversity	3	3					3	3			3
		CO 2:	Demonstrate, apply and explain insect reproduction, development and hormonal regulation	3		3				3	3	3		
		CO 3:	Demonstrate, apply and adapt the significance of parthenogenesis Paedogenesis in social insects	3		3				3			3	
		CO 4:	Demonstrate, apply and explain the evolution and biodiversity generation	3			3			3	3		3	
		CO 5:	Demonstrate, evaluate, and discuss the application of social insects	3						3				
PGZOE 3.1B	Elective paper 2A (Cellular and Molecular Biology)	CO 1:	Define and Demonstrate advanced issues related to structure and metabolism of Carbohydrates, Amino acids, Lipids, and nucleic acids	3						3				3
		CO 2:	Demonstrate, apply and elaborate the role of various enzymes in disease formation and disease diagnosis	3	3					3		3		
		CO 3:	Define, Demonstrate the cellular organization, cell division and cell cycle	3			3			3		3		
		CO 4:	Demonstrate, evaluate and compare the central dogma, its regulation and modifications	3		3	3			3			3	
		CO 5:	Demonstrate, apply and discuss the tools and techniques in molecular biology	3		3	3			3			3	
		CO 6:	Demonstrate and elaborate the application of tools for genetic engineering	3		3				3		2		
PGZOE 3.4	Parasitology, biology and Immunology	CO 1:	Demonstrate and apply the knowledge of dissection or surgical procedure of various endocrine organs and microtome procedure		3						3	3		
		CO 2:	Analyse and evaluate the bioassays of hormones like insulin and TSH		3							3		
		CO 3:	Analyse and estimate the glycogen/cholesterol/ascorbic and/fructose in given endocrine tissue		3							3		

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Course Code	Course Name	COs	CO Description	PO				Average mapping strength	PSO					Average mapping strength
				1	2	3	4		1	2	3	4	5	
PGZOOC	Immunology, Pa Developmental & Endocrine	CO 4:	Demonstrate and apply the knowledge of chick embryo, mounting and stage identification	3	3			3	3		2			2.64
		CO 5:	Demonstrate, apply and explain the knowledge of preparation of stains, fixatives, culture media for parasites, and their spot identifications and blood smear examination	3	3	3			3					
		CO 6:	Demonstrate and apply the knowledge on preparation and gel electrophoresis of blood sera		3		3					2	2	
PGZOEEC 3.2A	Dissertation and practical of elective paper 1A/ 2A	CO 1:	Demonstrate, analyse and apply the knowledge of Collection, Preservation, Curation, Identification and Classification of Major Insect Orders	3	3	3		3		3	3			3
		CO 2:	Demonstrate and evaluate the of Mouth parts, antenna and genitalia dissection of some major order of insects through dissection	3	3						3			
		CO 3:	Design and perform original research work in entomology				3				3		3	
PGZOEEC 3.2B	Dissertation and practical of elective paper 2A	CO 1:	Demonstrate, and apply the knowledge of DNA and protein isolation and evaluate the DNA quality through visualization	3	3			3			3	3		3
		CO 2:	Demonstrate perform and explain the bacterial culture and plasmid DNA preparation	3	3						3	3		
		CO 3:	Demonstrate and design the PCR primer	3	3						3	3		
		CO 4:	Design and perform original research work using molecular biology techniques		3	3	3					3	3	
PGZOOSOC 3	Value Education and Indian Culture	CO 1:	Define, Demonstrate and apply the daily routine, self-evaluation & Integral Personality Development	3				2.86					2	2.25
		CO 2:	Learn, and apply the Power of thoughts & the Science of Peace				2			2			2	
		CO 3:	Demonstrate and explain the relation: Values and enlightened citizenship				3						3	
		CO 4:	Discuss the awareness about the Indian Practice and Culture				3						3	
		CO 5:	Demonstrate and practice the Four Yogas	3									2	
		CO 6:	Explain and analyse the idea about Modern India: her hopes, challenges and Swami Vivekananda			3	3					2	2	
Semester IV														
PGZOOC 4.1	Taxonomy and Biostatistics	CO 1:	Define and explain the basic statistical concepts.	3				3				3	3	3
		CO 2:	Demonstrates, apply and analyse the descriptive statistics and construct skills in diagrammatic representations	3	3						3	3		
		CO 3:	Apply various sampling techniques and statistical inference to solve various problems		3	3					3	3		
		CO 4:	Formulate research objectives and research methodologies respectively			3	3						3	
		CO 5:	Apply machine learning tools to construct decisions			3	3					3		
PGZOOC 4.2	Genetics & Molecular Biology	CO 1:	Describe and explain various database used for nucleotides and proteins	3								3		

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Course Code	Course Name	COs	CO Description	PO				Average mapping strength	PSO					Average mapping strength
				1	2	3	4		1	2	3	4	5	
PGZOCC 4.1	Bioinformatics Computational biology	CO 2:	Demonstrate apply and discuss various algorithms for sequence analysis and molecular interactions	3	3			3				3		2.86
		CO 3:	Analyse nucleotide and protein sequences using various databases and software tools		3							2		
		CO 4:	Evaluate RNA interference and RNA regulatory networks.			3						3	3	
		CO 5:	Predict gene, ORF, protein structure and their functional role.				3					3	3	
PGZOCC 4.3	Bio python And LaTeX	CO 1:	Learn, evaluate and apply the handling and analysis of nucleotide, protein sequences and databases.	3	3	3		3	3			3		3
		CO 2:	Demonstrate, analyse and create neural networks and learn genetic algorithms.	3	3		3		3			3	3	
		CO 3:	Organize documents into different sections, subsections, etc., Formatting pages (margins, header, footer, orientation), Formatting text, create presentations using Beamer	3								3	3	
		CO 4:	Write complex mathematical formulae, Include tables and images, Cross-referencing, bibliography, and Indexing	3		3						3	3	
PGZOEC 4.1A	Elective paper 1B (Entomology)	CO 1:	Demonstrate, evaluate, analyse and apply the insect biology and its diversity in the field of agriculture, forest ecology, vector biology and forensic science	3	3	3		3	3	3			3	2.83
		CO 2:	Define, Demonstrate and apply the knowledge of insect biology in apiculture, sericulture, and lac culture	3		3			3	2			2	
		CO 3:	Demonstrate, access and apply the insect diversity in environment monitoring and the global environmental impact on insects	3	3	3			3	3			3	
		CO 4:	Demonstrate, apply and discuss the various aspect of Insect Ecology	3			3		3	3			3	
PGZOEC 4.1B	Elective paper 2B (Cellular and Molecular Biology)	CO 1:	Demonstrate and analyse various cellular metabolic disorders	3				3	3					3
		CO 2:	Demonstrate and evaluate the mendelian principles related to gene interactions and construct pedigree	3	3							3		
		CO 3:	Define, Demonstrate and discuss the gene transfer and gene manipulation methodologies in biotechnology	3		3						3	3	
		CO 4:	Demonstrate, design and apply the tools and techniques in molecular biology viz. PCR, Cloning.	3	3	3						3	3	
		CO 5:	Demonstrate, analyse and apply various nucleotide sequencing techniques	3	3	3						3	3	
PGZOEC 4.4	Phylogenetics, Biostatistics and Bioinformatics	CO 1:	Demonstrate and apply MEGA software to draw Phylogenetic tree	3	3			2.93				2		2.5
		CO 2:	Demonstrate, analyse and evaluate the molecular taxonomy and bar coding	3	3							3	3	
		CO 3:	Demonstrate and apply the Basics operations in R, data Visualization with R and construct graph	3	3							3	3	
		CO 4:	Demonstrate and apply various data analysis tools and techniques	3		3						2	2	
		CO 5:	Demonstrate, evaluate and apply the concept of facilitating the access from various Bioinformatics databases	3			3					3	3	
		CO 6:	Examine various in silico Experiments	3			2					2		
		CO 7:	Demonstrate and apply the python for bioinformatic analysis	3	3							2	2	

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Course Code	Course Name	COs	CO Description	PO				Average mapping strength	PSO					Average mapping strength
				1	2	3	4		1	2	3	4	5	
PGZOOEC 4.2A	Submission of final dissertation and practical of elective paper IB / 2B	CO 1:	Demonstrate and evaluate the knowledge of morphology of typical insects under different orders	3				3			3			3
		CO 2:	Demonstrate, analyse and evaluate the wing venations of insects under order Diptera, Coleoptera & Lepidoptera	3			3			3	3			
		CO 3:	Prepare a report on Apiary / Sericulture institute visit	3		3					3		3	
		CO 4:	Design, examine and interpret original research work in Entomology	3			3				3		3	
PGZOOEC 4.2B	Dissertation (Submission of final dissertation) and practical of elective	CO 1:	Demonstrate, evaluate and apply the knowledge of PCR	3	3			3			3	3		2.75
		CO 2:	Demonstrate, perform and discuss cloning and sequencing	3	3	3					3	3		
		CO 3:	Demonstrate and apply the knowledge of DNA barcoding	3	3	3					2	2		
		CO 4:	Design, examine and interpret original research work using molecular biology techniques		3		3				3		3	
PGZOOSC-4	Fundamentals of remote sensing and GIS	CO 1:	Define, demonstrate and evaluate the basics of GIS and remote sensing and its application	3		3		3			3		3	3
		CO 2:	Demonstration and apply the basic Map preparation in ArcGIS	3	3						3		3	
		CO 3:	Learn and analyses the handling of satellite data and visualization	3	3	3						3	3	

Grand Average (PO) = 2.98

Grand Average (PSO) = 2.82

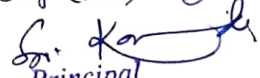

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PHD													
Course Code	Course Name	COs	CO Description	PO				Average mapping strength	PSO				Average mapping strength
				1	2	3	4		1	2	3	4	
Semester I													
PHDZOO 01	Research Methodology	CO 1:	Understand the objectives, motivation and types of research	3				3		3			3
		CO 2:	Define and formulate a research problem				3		3				
		CO 3:	Collect data (primary or secondary) based on the formulated problem and analyse the data.		3						3		
		CO 4:	Analyse the data with hypothesis testing, generalization and interpretation.			3					3		
		CO 5:	Discuss the application of results and write the thesis.			3					3		
PHDZOO 02	Computer Applications	CO 1:	Explain and use TeX and LaTeX.		2			2.8	3				3
		CO 2:	Understand the advantages of LaTeX over other more traditional software's.	3						3			
		CO 3:	Prepare handouts and presentations using LaTeX.				3				3		
		CO 4:	Understand the core Python scripting elements such as variables and flow control structures.	3							3		
		CO 5:	Use Python to read, write, demonstrations files.			3						3	
PHDZOO 03	Literature review	CO 1:	Identify and retrieve relevant publications within a field of research and write a literature review by searching the literature systematically.		3			3	3				3
		CO 2:	Select representative scientific sources from several perspectives relevant to the assignment.		3					3			
		CO 3:	Write a research proposal for obtaining Financial assistance from national funding agencies.				3					3	
		CO 4:	Draw conclusions related to the research problem and give recommendations towards new research opportunities.				3				3		
		CO 5:	Represent and systematically structure a discussion on the theories and experimental results and define, design and write a literature review independently			3					3		
PHDZOO 04	Tools and techniques in molecular biology and	CO 1:	Develop competency in molecular biology techniques	3				3	3		3		3
		CO 2:	Demonstrate and apply techniques in biomolecules purification and characterisation		3					3			
		CO 3:	Apply and analyse microscopic and histochemistry techniques			3					3		
		CO 4:	Design research experiments in molecular biology and genetic engineering.				3					3	
		CO 5:	Conducting molecular biology and genetic engineering experiments.				3						
PHDZOO 05	Pharmacology and Toxicology	CO 1:	Demonstrate and apply the scopes and techniques in Pharmacology and Toxicology.	3				3	3	3			3
		CO 2:	Evaluate the mechanism of Drug actions.		3					3			
		CO 3:	Demonstrate and analyse the pharmacogenomics.			3					3		
		CO 4:	Develop the skill of designing experiments in Pharmacology and Toxicology.				3					3	
		CO 5:	conduct experiments in Pharmacology and Toxicology.				3						
36	trial	CO 1:	Demonstrate the microbial pathogens and Anti-microbial defence.	3						3			
		CO 2:	Analyse and evaluate the role of natural compounds against microbes.		3	3				3	3		

Course Code	Course Name	COs	CO Description	PO				Average mapping strength	PSO				Average mapping strength
				1	2	3	4		1	2	3	4	
PHDZOO	Anti-Micro Defence	CO 3:	Demonstrate and apply the acquire knowledge about the Chemotherapeutic agents.	3				3	3	3			3
		CO 4:	Develop the skill of designing experiments to evaluate the impact of antimicrobial compounds.				3					3	
		CO 5:	Ddevelop the ability to conduct experiments to evaluate the impact of antimicrobial compounds.				3					3	
PHDZOO 07	Ecology, Environment and animal behaviour	CO 1:	Demonstrate the biodiversity and genetic diversity.	3				3		3			3
		CO 2:	Demonstrate and analyse the biodiversity through molecular and computational approach.		3	3				3	3		
		CO 3:	Apply the acquired knowledge about the field studies and evaluate various tools and techniques in biodiversity study.	3	3				3				
		CO 4:	Develop the skill of designing field-based experiments to evaluate the environmental impact on biodiversity.				3					3	
		CO 5:	Develop the ability to conduct experiments to evaluate the ecological and environmental impact on biodiversity.				3					3	
PHDZOO 08	Bioinformatics and computational Biology	CO 1:	Demonstrate the bioinformatics and its applications.	3				3		3			3
		CO 2:	Demonstrate and evaluate various tools in bioinformatics.	3	3					3			
		CO 3:	Apply and analyse the genome sequence, gene mapping, gene identification, prediction and protein structure prediction.	3		3			3		3		
		CO 4:	To develop the skill of designing computational-based experiments.				3					3	
		CO 5:	To develop the ability to conduct computational-based experiments.				3					3	

Grand Average (PO) = 2.98.

Grand Average (PSO) = 3


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