

UG Zoology , RKMVC College

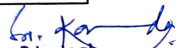
Course code	Title of the Course	Need			Remarks
		Experiential Learning	Participative Learning	Problem solving methodology	
UGZOOCC01	Non-chordates I: Protists to pseudocoelomates	✓		✓	various larvae and sponges respectively. Acquire skills on the structural and functional features of invertebrate animal life's diversity
UGZOOCC02	Principles of ecology	✓	✓	✓	Analyze, apply and evaluate the various concepts of population and community and relate the impact of man on the ecological balance. Apply the acquired knowledge to solve the environmental and ecological problems. Demonstrate and evaluate the interactions among various environmental parameters
UGZOOCC03	Non-chordates II: coelomates	✓	✓	✓	Learn different vector born diseases and the related life cycles, epidemiology, pathology, diagnosis, symptoms and treatments and take part in controlling these diseases. Demonstrate and apply various techniques of sericulture, apiculture, lac culture and pearl culture. Thus create the enterprenureship. Understand and apply the basics of sericulture, apiculture, lac culture and pearl culture.
UGZOOCC04	Cell biology	✓		✓	stain different cell types. Know how to measure and stain different cell types.
UGZOOCC05	Diversity of chordates	✓		✓	Students will learn how to apply the knowledge of poultry managements and different breeds of domestic animals.
UGZOOCC06	Animal physiology: Controlling and coordinating systems	✓	✓		Students will examine histology different tissues through preparation of temporary and peranent slides. Demonstrate and evaluate the histology of endocrine glands.
UGZOOCC07	Fundamentals of biochemistry	✓	✓	✓	lipids and chromatographic separation of amino acids. They will Demonstrate, apply and evaluate some instrumentation such as microscopy, chromatography, electrophoresis, centrifugation, spectrophotometry etc.


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UGZOCC08	Comparative anatomy of vertebrates	✓				different systems such as, integumentary, skeletal, digestive, respiratory, circulatory, urinogenital, nervous and sensory organs in the vertebrate groups.
UGZOCC09	Animal physiology: Life sustaining systems	✓	✓	✓		Students will Compare and analyse the histology of different tissue, determine ABO Blood group, and examine red blood cells, white blood, haemoglobin and blood pressure
UGZOCC10	Biochemistry of metabolic processes	✓	✓	✓		Students will estimate total protein and evaluate SGOT and SGPT or GST and GSH in serum/ tissue.
UGZOCC11	Molecular biology	✓	✓	✓		growth. Demonstrate and apply various molecular tools and techniques like PCR, southern, northern and western blotting, recombinant DNA technology etc. Students will be able to elaborate various tools and techniques related to bacterial microbiology and apply some aspects of applied microbiology and diseases related to microbiology.
UGZOCC12	PRINCIPLES OF GENETICS	✓		✓		Illustrate and compare various aspects of human genetics by covering chromosomal aberrations, gene mutation, etc..
UGZOCC13	Developmental biology	✓		✓		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.
UGZOCC14	Evolutionary biology	✓				Explain the population genetics and evaluate the evolutionary forces and its impact.
UGZODSE1	Immunology	✓	✓	✓		nodes and analyse the bloodcells, blood groups and immune reactions
UGZODSE2	Animal behaviour and chronobiology	✓		✓		EM, SD - Compare nesting habits of animals, analyse the ethogram and prepare a short report on behavioural activities of animals


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UGZOODSE3	Pollination biology	✓	✓	✓	EM, EN - Illustrate and evaluate the basic principle and modes of pollination, types and identification of flower visitors, pollinator diseases, colour vision capabilities of insect pollinators. SD - Evaluate and prepare report on the relationship between the flowering plants and mouthparts of the pollinating insects
UGZOODSE4	Project work	✓	✓	✓	biological data. Identify research questions and design insilico experiments
UGZOODSE5	Biodiversity and wild life conservation	✓	✓	✓	Understand and apply the various tools used in field biology. Prepare complete report on excursion or field visit.
UGZOODSE6	Computational biology	✓	✓	✓	biological data. Demonstrate and apply the tools in bioinformatics and biostatistics
UGZOUGE 1	Animal diversity and systems	✓		✓	Define, demonstrate and illustrate the basic endocrinology and histology of animals.
UGZOUGE 2	Ecology, economic and medical zoology	✓	✓	✓	Illustrate, analyse and evaluate the concept of ecology, biodiversity and wildlife conservation. Define, demonstrate and apply the concept of parasitism and evaluate the life history, pathogenicity and clinical features of selected parasites. Define and understand the basic principles of biotechnology and immunology.
UGZOUGE 3	Biotechnology: microbes to animals	✓	✓	✓	Demonstrate and evaluate the application of microbes in biotechnology. Extend the basic concept in biotechnology and human welfare and perform experiments.
UGZOUGE 4	Insect, vectors and diseases	✓	✓	✓	Demonstrate, identify and prepare report on different vectors and their associated diseases.
UGZOUSEC1	Value education & indian culture	✓	✓		Understand the relation: Values and enlightened citizenship. Explain and analyse the idea about Modern India: her hopes, challenges and Swami Vivekananda


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UGZOOSEC2	Spoken Tutorial from IIT Bombay	✓	✓	✓	Build gene-regulatory and biochemical networks by CellDesigner, a structured diagram editor. Design models of biochemical reaction networks in Computer-readable format.
UGZOOAECC 01	English	✓	✓	✓	Apply the requisite communicative skills and strategies to future careers. Gain an insight into cultural literacy and cross-cultural awareness and engage in self-directed English language learning
UGZOOAECC 02	Environmental Science	✓	✓	✓	Illustrate and apply the knowledge about the social, environmental issues and environmental legislation. Define, demonstrate and evaluate the impact of human population on the Environment


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Programme Code: PGZOO, Programme name: M.Sc. Zoology						
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			Experiential Learning	Participative Learning	Problem solving methodology	
1	PGZOOCC 1.1	Diversity and biology of Nonchordates	✓		✓	apply the biological and medicinal importance of various larvae and sponges respectively. Acquire skills in teaching the structural and functional features of invertebrate animal life's diversity.
2	PGZOOCC 1.2	Diversity and biology of Chordates	✓		✓	Demonstrate, analyse and discuss structural adaptation of different vertebrates.
3	PGZOOCC 1.3	Cell biology & Instrumentations	✓	✓	✓	Acquire and apply various knowledge on tools and techniques in cell biology. Apply various knowledge on instrumentation to a start up diagnostic lab in cell biology. Explain and apply centrifugation, spectrophotometry, electrophoresis & blotting and microscopy.
4	PGZOOCC 1.4	Genetics	✓		✓	Demonstrate, analyse and apply the concept of crossing over & linkage to construct gene map.
5	PGZOOCC 1.5	Structures & systems of organisms	✓		✓	Demonstrate and apply the knowledge of hypophyseal technique. Acquire, apply and evaluate knowledge on aquaculture farm operation.
6	PGZOOCC 1.6	Tools & techniques in biological study	✓	✓	✓	Analyse the adulteration and estimate the insulin applying the knowledge on HPLC and ELISA respectively. Apply various knowledge on instrumentation to a start up diagnostic lab in biochemistry. Apply the knowledge on preparation, purification and gel electrophoresis of DNA
7	PGZOOSOC 1	Yoga	✓		✓	Understand and improve the decision-making capacity, build up confidence in their life.


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8	PGZOOCC 2.1	Biochemistry & Metabolism	✓	✓	✓	Understand, apply and discuss the synthesis of fatty acids and nucleic acids. Apply various knowledge on instrumentation to a start up diagnostic lab in bichemistry. Demonstrate, evaluate and analyse the different metabolic pathways.
9	PGZOOCC 2.2	Molecular biology & Biotechnology	✓	✓	✓	Understand and apply the gene regulation, gene silencing and non-coding RNAs interference for drug development. Apply various knowledge on Molecular biology and Biotechnology to set a start up biotech farm. Explain, adapt and apply different genetic engineering tools
10	PGZOOCC 2.3	Ethology & chronobiology	✓	✓	✓	Understand and apply the animal's communications system in resource exploration and discuss the significance. Apply various knowledge on resource exploration to set up animal husbandary. Define, Understand and analyse the various types of social organization in animals
11	PGZOOCC 2.4	Ecological sciences	✓	✓	✓	Understand, apply and formulate the riverine and wetland ecosystem management. Apply various knowledge on ecosystem and envirmmental to provide consultancy service. Demonstrate, analyse and design models in the population and community ecology
12	PGZOOCC 2.5	Biochemical and molecular aspects of life	✓	✓	✓	Apply the knowledge of cell culture lab protocols. Apply various knowledge on molecularbiology to a start up diagnostic lab in cell biology. Identify, analyse and solve DNA sequence.


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13	PGZOOCC 2.6	Ethology & Ecology	✓	✓	✓	Perform toxicity test, physicochemical parameters of water and soil. Apply various knowledge on ecosystem and environmental to provide consultancy service. Apply, analyse and adapt the knowledge of population ecology to solve ecological problems
14	PGZOOSOC 2	Communicative English	✓	✓	✓	Enhance their English language proficiency in the aspects of reading, writing, listening and speaking. Apply the requisite communicative skills and strategies to future careers.
15	PGZOOCC 3.1	Parasitology and Immunology	✓	✓	✓	Remember, explain and analyse the parasites detection, diagnosis, prophylaxis and host parasite interactions. Explain and apply the knowledge on immunological mechanisms of infectious and noncommunicable disease formation.
16	PGZOOCC 3.2	Developmental biology and Neurobiology			✓	Demonstrate the brain aging and various neuropathological diseases.
17	PGZOOCC 3.3	Endocrine physiology			✓	Illustrate and discuss the reproductive disorders endocrine disruptions
18	PGZOOEC 3.1A	Elective paper -Entomology	✓		✓	Demonstrate, evaluate, and discuss the application of social insects. Attain a solid foundation in insect biology, including general entomology, basic systematics, morphology, physiology, and biodiversity
19	PGZOOEC 3.1B	Elective paper-Cellular and Molecular Biology	✓	✓	✓	Demonstrate, apply and elaborate the role of various enzymes in disease formation and disease diagnosis. Apply various knowledge on genetic engineering to set a start up biotech farm. Understand and elaborate the application of tools for genetic engineering


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20	PGZOOCC 3.4	Immunology, Parasitology, Developmental biology & Endocrinology	✓	✓	✓	Apply the knowledge of preparation of stains, fixatives, culture media for parasites, and their spot identifications and blood smear examination Apply various knowledge on histology and immunology to set a start up diagnostic lab
21	PGZOOEC 3.2A	Dissertation and practical of elective paper - Entomology	✓		✓	Demonstrate, analyse and apply the knowledge of Collection, Preservation, Curation, Identification and Classification of Major Insect Orders. Design and perform original research work in Entomology.
22	PGZOOEC 3.2B	Dissertation and practical of elective paper - Cellular and Molecular Biology	✓	✓	✓	Demonstrate and perform bacterial culture and plasmid DNA preparation. Apply various knowledge on molecular diagnostic to set a start up diagnostic lab. Demonstrate, and apply the knowledge of DNA and protein isolation and evaluate the DNA quality through visualization
23	PGZOOSOC 3	Value Education and Indian Culture	✓		✓	Define, understand and apply the daily routine, self-evaluation & Integral Personality Development. Demonstrate and practice the Four Yogas
24	PGZOOCC 4.1	Taxonomy and Biostatistics	✓	✓	✓	Demonstrates, analyse and apply the descriptive statistics and construct skills in diagrammatic representations. Apply various sampling techniques and statistical inference to solve various problems
25	PGZOOCC 4.2	Bioinformatics and Computational Biology	✓	✓	✓	Analyses nucleotide and protein sequences using various databases and software tools. Evaluate RNA interference and RNA regulatory networks. Predict gene, ORF, protein structure and their functional role.


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26	PGZOOCC 4.3	Bio python and LaTeX	✓		✓	Organize documents into different sections, subsections, etc., Formatting pages , Formatting text, create presentations using Beamer. Learn, evaluate and apply the handling and analysis of nucleotide, protein sequences and databases.
27	PGZOOEC 4.1A	Elective paper -Entomology	✓	✓	✓	Apply the insect biology and its diversity in the field of agriculture, forest ecology, vector biology and forensic science. Apply the knowledge of insect biology in apiculture, sericulture, and lac culture. Understand, access and apply the insect diversity in environment monitoring and the global environmental impact on insects
28	PGZOOEC 4.1B	Elective paper -Cellular and Molecular Biology	✓	✓	✓	Remember, understand and apply the gene transfer and gene manipulation methodologies in biotechnology. Apply the tools and techniques in molecular biology viz. PCR, Cloning. Understand, analyse and apply various nucleotide sequencing techniques
29	PGZOOCC 4.4	Phylogenetics, Biostatistics and Bioinformatics	✓		✓	Demonstrate and apply the Basics operations in R, data Visualization with R and construct graph. Demonstrate and apply the python for bioinformatic analysis
30	PGZOOEC 4.2A	Submission of final dissertation and practical of elective paper Entomology	✓	✓	✓	Demonstrate and evaluate the knowledge of morphology of typical insects under different orders. Apply the knowledge of insect biology in apiculture, sericulture, and lac culture. Design, examine and interpret original research work in Entomology


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31	PGZOOEC 4.2B	Submission of final dissertation and practical of elective paper - Cellular and Molecular Biology	✓	✓	✓	Apply the knowledge of DNA barcoding, cloning and sequencing. Apply the tools and techniques in molecular biology viz. PCR, Cloning, barcoding, cloning and sequencing. Design, examine and interpret original research work using molecular biology techniques.
32	PGZOOSOC 4	Fundamentals of remote sensing and GIS	✓	✓	✓	Understand and evaluate the basics of GIS and remote sensing and its application. Demonstration and apply the basic Map preparation in ArcGIS.


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Programme Code: PHDZOO, Programme name: Ph.D. Zoology						
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			Experiential Learning	Participative Learning	Problem solving methodology	
1	PHDZOO 01	Research Methodology	✓	✓	✓	Students will be able to understand the objectives, motivation and types of research. Collect data (primary or secondary) based on the formulated problem and analyse the data. Discuss the application of results and write the thesis.
2	PHDZOO 02	Computer Applications	✓	✓	✓	Students will be able to understand the core Python scripting elements such as variables and flow control structures. Use Python to read, write, demonstrations files.
3	PHDZOO 03	Literature review	✓	✓	✓	Students will be able to identify and retrieve relevant publications within a field of research and write a literature review by searching the literature systematically. Write a research proposal for obtaining Financial assistance from national funding agencies.
4	PHDZOO 04	Tools and techniques in molecular biology and biochemistry	✓	✓	✓	Students will be able to Develop competency in molecular biology techniques. demonstrate and apply techniques in biomolecules purification
5	PHDZOO 05	Pharmacology and Toxicology	✓	✓	✓	Students will be able to demonstrate and apply the scopes and techniques in Pharmacology and Toxicology.
6	PHDZOO 06	Anti-Microbial Defence	✓	✓	✓	Demonstrate the microbial pathogens and Anti-microbial defence and its impact in environmental sustainability.
7	PHDZOO 07	Ecology, Environment and animal behaviour	✓	✓	✓	Students will be able to apply the acquired knowledge about the field studies and evaluate various tools and techniques in biodiversity study. Obtain knowledge on collection, preservation and identification of museum specimens.
8	PHDZOO 08	Bioinformatics and computational Biology	✓	✓	✓	Students will be able to apply and analyse the genome sequence, gene mapping, gene identification, prediction and protein structure prediction.


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