PROGRAMME OUTCOMES AND COURSE OUTCOMES

2022 – 2023

NAME OF THE PROGRAMME: M.Sc ZOOLOGY **PROGRAMME CODE: PSZO**

Programme Outcomes:

PO 1	Apply Acquired knowledge to solve major and complex issues in the society/industry.
PO 2	Attain research skills to solve complex Cultural, Societal and Environment issues.
PO 3	Employ latest and updated tools and technologies to solve complex issues.
PO 4	Demonstrate Professional Ethics that foster Community, Nation and Environment Building Initiatives.
PO 5	Develop the scientific temperament to carry out research project with professional ethics.

Course Outcomes

Course Code	Course Title	Course Outcomes
19PG1Z1	**Animal Diversity**	CO 1 Recall the levels of organization among Invertebrates and Chordates. CO 2 Bring out the General characters of Invertebrates. CO 3 Classify the Phyla of Invertebrates and Chordates up to class level. CO 4 Distinguish between Invertebrates and Chordates. CO 5 Predict the systematic Position of Animals.

19PG1Z2	**Microbiology**	CO 1 Describe the scope of microbiology, taxonomical classification, principle and components of different types of microscopes CO 2 Classify bacteria based on morphology, biochemical characteristics and growth parameters CO 3 Discuss the morphology, classification and cultivation of viruses. CO 4 Explain the microbial genetics and metabolism of bacteria CO 5 Appraise the role of bacteria in food, industry, medicine, environment and agricultural microbiology

19PG1Z3	**Cell & Molecular Biology**	CO 1 Explain the ultrastructure and functions of Cytoskeletons and Plasma membrane CO 2 Discuss the complexity of eukaryotic genome organization and its replication in Prokaryotes & Eukaryotes CO 3 Describe the process of transcription and post transcriptional modification in Eukaryotes CO 4 Evaluate the regulation of transcription and translation in Prokaryotes & Eukaryotes CO 5 Assess the events of cell cycle, cell signalling pathways, cell death and cancer
19PG1Z4	**Lab In Animal Diversity & Microbiology**	CO 1 Identify the diversity of animals. CO 2 Explain the fundamental organization of cells. CO 3 Prepare different types of media. CO 4 Demonstrate bacterial isolation technique and maintain pure culture.

		CO 5 Identify unknown bacteria by biochemical testing.
19PG1Z5	**Lab In Cell & Molecular Biology**	CO 1 Classify and sketch the various microscopy CO 2 Estimate the quantity of DNA and RNA CO 3 Infer the qualitative estimation of DNA and RNA CO 4 Organize the steps in isolation of genomic DNA CO 5 Interpret the mitotic stages of onion root tip
19PG1ZEDC	**Herbal Medicine**	CO 1 Make use of alternative medicinal methods. CO 2 Outline the importance of herbs used in day today life. CO 3 Categorize the usage of herbs for different ailments. CO 4 Solve the life style disorders with food supplements. CO 5 Prepare various herbal products.
19PG2Z6	**Genetics**	CO1 Classify the pattern of inheritance of traits by various crosses.

		CO2 Identify the pattern of sex determination in various organisms. CO3 Analyse the mechanism of crossing over and linkage CO4 Determine the types of variation in chromosome. CO5 Assess the process of bacterial recombination in microbial genetics.
19PG2Z7	**Evolution**	CO1 Outline the origin and evolution of life CO2 Categorize the evidences and theories of organic evolution CO3 Describe the mechanism of evolution CO4 Write about the natural selection and speciation CO5 Explain the molecular and human evolution
19PG2Z8	**Biochemistry**	CO 1 Analyse the metabolic pathways of carbohydrates CO 2 Recall the structure, properties and metabolism of amino acids and Protein. CO 3 Assess the structure, properties and metabolism of Lipids CO 4 Identify the structural organization and metabolism of Nucleic Acids.

		CO 5 Describe the mechanism of enzyme and hormone action.
19PG2Z9	**Lab in Genetics & Evolution**	CO 1 Determine the sex in man by barr bodies. CO 2 Experiment with the simple mendelian traits. CO 3 Examine the process of Sex determination in man and fruit fly. CO 4 Construct the Pedigree charts by systematic listing of parents. CO 5 Relate the genotypic frequencies by Hardy-Weinberg equilibrium.
19PG2Z10	**Lab in Biochemistry**	CO 1 Find appropriate skills in handling basic equipments CO 2 Trace the strength of unknown solutions using formula to find the value CO 3 Estimate the various biomolecules using standard protocols and Design experiments to solve research problems CO 4 Apply the principles and procedures to demonstrate the experiments CO 5 Assess the experiments with the data arrived and interpret the results
19PG2ZEDC	**Herbal Medicine**	CO 1 Make use of alternative medicinal methods.

		CO 2 Infer the importance of herbs used in day today life. CO 3 Categorize the usage of herbs for different ailments. CO 4 Solve the life style disorders with food supplements. CO 5 Prepare various herbal products.
Off Class	**SPSS**	CO 1 Apply the knowledge of research to frame the questionnaire based on hypothesis CO 2 Organize the data in the form of Chart and diagrams using SPSS CO 3 Analyze the data using descriptive statistics, T test, correlation and regression CO 4 Demonstrate ANOVA and Hierarchical Clustering using SPSS software CO 5 Interpret the results obtained through SPSS analysis tools
19PG3Z11	**Biophysics**	CO 1 Classify the chemical bonds and forces interacting between molecules and Determine the theories involved in acidity and basicity CO 2 Apply the principles of Thermodynamics and biological oxidation in

		living organisms CO 3 Determine the principle, procedure, components involved and biological applications of Instruments CO 4 Analyse the principle, properties, instrumentation and biological applications ofElectromagnetic radiation CO 5 Assess the principles of Photobiology in the Biophysical aspects of Vision and Neurophysiologyapplied to the Animals
19PG3Z12	**Immunology**	CO 1 Summarize the overview of the immune system CO 2 Elaborate the structure and properties of antigen and antibody and its interactions. CO 3 Determine the concept of MHC molecules and maturation and activation of lymphocyte. CO 4 Analyze the complement system and the types of hypersensitivity reactions.

		CO 5 Prioritize the types of vaccines and immunity in health and disease.
19 PG3Z13	**Biostatistics & Research Methodology**	CO 1 Organise the research data in appropriate order and apply the measures of central tendency and dispersion values. CO 2 Assess the difference between the expected and observed frequencies by Chi-Square test for testing of hypothesis CO 3 Compute degrees of relationship variables using Correlation and Regression analysis. CO 4 Examine the Concepts of Research and devise the Research Hypothesis CO 5 Paraphrase the research work through documentation as a Thesis, Oral or Poster Presentation.
19PG3ZE1	**Fisheries &Aquaculture**	CO 1 Identify the economically important fishes and fishery products. CO 2 Plans according to the recent concepts in fisheries management. CO 3 Distinguish the various aquaculture systems. CO 4 Organizes the type of hatchery, brood stock, larval production, feed management water quality and disease management in cultivable species,

		live feed production. CO 5 Evaluates the Fisheries and Aquaculture Practices in India.
19PG3ZE2	**Bioinformatics**	CO 1 Summarize the Human Genome Project, shotgun sequencing, web browsers and search engines and flat file of biological databases. CO 2 Explain DOTPLOT , dynamic programming using Needleman-Wunsch Algorithm and development in significance of substitution matrices CO 3 Make use of different PAM and BLOSUM for closely and distantly related sequences, Multiple sequence alignment CO 4 Examine Model Phylogenetic tree based on the distance matrix CO 5 Determine the secondary structure and three dimensional structure prediction methods
19PG3Z14	**Lab in Biophysics & Biostatistics**	CO 1 Recall the principle of centrifuge, pH meter, Chromatography CO 2 Determine the maximum absorption and its molar extinction coefficient of sample CO 3 Estimate the pH Titration curve, Surface tension and viscosity of

		sample CO 4 Interpret the results for statistical analysis including mean, median, mode and Standard deviation for individual, continuous series CO 5 Determine the correlation, regression and significance for the statistical data
19PG3 Z15	**Lab in Immunology, Fisheries &Aquacultureand Bioinformatics**	CO 1 Explain the different lymphoid organs, properties of soluble and particulate antigen CO 2 Estimate the lymphocytes from peripheral blood and explain the biological databases NCBI CO 3 Construct various bleeding techniques and separation of serum and plasma and plan a visit to aquarium. CO 4 Examine the experiment with complement mediated lysis, Immunoelectrophoresis and rocket immunoelectrophoresis identification and single / double immunodiffusion CO 5 Analyze the sequences BLAST AND ClustalO and Assess the formation of perciptin line and button formation

19PG4Z16	**Environmental Biology**	CO 1Develop an understanding of ecological key interactions and processes CO 2 Explain the factors involved in determining population size, Density, Distribution &Community function CO 3 Analyze sustainable utilization of natural resources CO 4 Agree significance of Biodiversity, consequences on loss of Biodiversity& conservation Strategies CO 5 Criticize various kinds of pollution in the environment, their impact on the ecosystem & impact of climatic change
19PG4Z17	**Biotechnology**	CO 1Find the enzymes in rDNA technology CO 2Compare the cloning vehicles with their specific advantages CO 3Criticize the boon technology of *in-vitro* fertilization CO 4 Analyse the technique of tissue culture CO 5 Identify the importance of artificial blood
19PG4Z18	**Developmental**	CO 1 Recalls the basic concepts of Developmental Biology.

	Biology	CO 2 Explain how fertilization, cleavage and Gastrulation occur. CO 3Compares the basic concepts of organogenesis in different organisms. CO 4Understand the development of egg into a foetus, then into adult. CO 5 Associate the embryo development with Phylogeny.
19PG4ZE3	**Economic Zoology**	CO 1 Compare the morphological adaptation in bees in relation to their social behaviour CO 2 Plan for a sericulture unit as a cottage industry. CO 3 Analyse the rearing methods of prawn and pearl oysters. CO 4 Summarize the rearing methods of chick. CO 5 Assess the commercial importance of dairy farm
19PG4ZE4	**Ethology**	CO 1 Classify different patterns of genetic, environmental, neural and hormonal animal behaviour CO 2 Explains the role of visual, auditory communication with respect to learning and instincts mechanism CO 3 Discuss the various reproductive and social behaviours in context to

		pair selection. CO 4 Summarizes the ecological condition such as hunger, thirst, territories etc., in influencing the animal behaviour. CO 5 Elaborate the molecular regulation of circadian rhythm
19PG4Z19	**Lab in Environmental Biology & Developmental Biology**	CO 1 Find the primary productivity CO 2 Demonstrate the estimation of various components of soil and water. CO 3 Identify the zoo planktons in water sample. CO 4 Analyse the various developmental stages of chick embryo CO 5 Compare the diversity of species by quadrat method.
19PG4Z20	**Lab in Biotechnology, Economic Zoology & Ethology**	CO 1Demonstrate the plant tissue culture technique. CO 2 Experiment with DNA isolation CO 3 Estimate DNA quantitatively CO 4 Analyse Newton's bee hive CO 5 Relate nest building in different birds