Kalinga University
Science
Master Of Science (Zoology)

PO

S. No.	Program Outcome (PO) Description
1	Apply the knowledge of Zoology, Life Sciences and allied subjects to understand of complex life processes and phenomena.
2	Understanding the evolutionary processes through origin of life from acellular animal (Protozoa) to multicellular organisms (from dinosaur to humans).
3	Design processes/strategies that meet the specified needs with appropriate consideration for the public health, societal, and environmental considerations.
4	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions in real situations.
5	Demonstrate, solve and an understanding of major concept of all physiological activities in various disciplines of Zoology such as Entomology (study of insects), Ichthyology (detailed study of fishes including their habit and habitat), Ornithology (study of birds including migration of birds which fascinates the students).
6	To inculcate the scientific temperament in the students through field visits for better understanding of the behavioral responses, industrial & natural processes.
7	Create an awareness among the people outside the scientific communityregarding the impact of Zoology on the environment, society, and development of the community.
8	To study the ecological phenomenon from ecosystem to protection of endangered species by in-situ and ex-situ conservation.
9	Understand the concept, process, physiology and molecular basis of animal development.
10	Identify a range of invertebrates and vertebrates and justify their conservation.

11	Identify, review research literature, analyze the complex processes and adaptation strategies of organisms.
12	Apply ethical principles and commit to professional ethics and responsibilities and norms of the work/research practice.

PSO

S. No.	Program Specific Outcome (PSO) Description
1	Students would sufficiently be skilled and empowered to solve the problems in the area of Zoology and its allied areas.
2	Understand the testing of hypothesis and different behavior patterns of animals.
3	Gain the knowledge of Zoology through theory and practical. Use modern Zoological tools, Models, Charts and Equipment.
4	The bright and ignited mind may enter into research in the contemporary areas of Zoological/Biological Sciences.
5	The broad skills and the deeper knowledge in the field would make them highly successful and excellent researcher in advanced areas of research in the field of biological sciences.

CO

S.No.	Course Code	Course Name	Course Outcome (CO's) - Description
1	MZOO101	BIOSYSTEMATICS AND TAXONOMY	**CO1:** Knowledge of taxonomy would facilitate in the evolutionary relationship and their taxonomic aspects. They will be aware of the standards followed globally for naming any newly discovered species. The students would be able to address issues related to diversity assessment in future.
2	MZOO102	CELL AND MOLECULAR BIOLOGY	**CO1:** The students will be able to understand how the cell functions as a unit of life. They will gain knowledge about the techniques and experiments that contributed to the understanding of molecular mechanisms of the cellular processes. Appreciate the importance of cell-cell adhesion and the extracellular matrix in the evolution of multicellular organisms.
3	MZOO103	Structure and Function of Invertebrates and Vertebrates	**CO1:** The students will appreciate evolutionary changes and environmental adaptations in different taxa of animal kingdom. They will be able to demonstrate comprehension of invertebrate evolution beginning with the ancestral protozoans and going upto top order organism like mammals. Differentiate organisms into invertebrate & vertebrate phyla and classes based on the morphology, physiology, reproduction, development, behaviour and habitat. Correctly identify representative species of animal kingdom from select phyla.
4	MZOO104	BIOCHEMISTRY AND ENDOCRINOLOGY	**CO1:** At the end of the course, the students should be able to understand the basic organization of the vertebrate brain, and the interaction of hypothalamus with the pituitary and pineal gland. Learn basic principles of important techniques applied to neuroendocrine research. Understand neuroendocrine regulation of physiological processes. Develop the ability of appreciate the complex mechanism regulating the biology in animals.
5	MZOO105A	RESEARCH METHODOLOGY	**CO1:** Develop understanding on various kinds of research, objectives of doing research, research process, research designs and sampling.
			CO2: Have basic knowledge on qualitative research techniques
			CO3: Have adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis
			CO4: Have basic awareness of data analysis-and hypothesis testing procedures
			CO5: Undestand about research tools.

6	MZOO105B	SCIENCE JOURNILISM	**CO1:**	They will appreciate the digital landscape within which science journalism exists today by learning: blogging in science journalism (honing your craft, developing a voice); how to get work (pitching and staying relevant); the value of social networks for science journalism (sharing stories, finding stories, joining discussions and finding sources); digital strategies employed by major news organizations (data visualization, multimedia, community building).
			CO2:	Students will analyze and learn about the structure of several types of data including numbers, texts and documents. Students will learn the skills to examine, evaluate, and critique those data, extract patterns, summarize features, create visualizations, and provide insights, while learning to be sensitive to ethical concerns associated
7	MZOO201	EVOLUTION AND BIOSTATISTICS	**CO1:**	Students studying this course will be able to perform the data analysis using the statistical tools available on any computer such as excel as well the programs for big and complex data. They will be able to handle high proteomic and genetic data. They will be able to understand the maintenance of computers, server and big data files. This course will make them suitably knowledgeable to undertake the computer jobs in the offices in the hospitals, scientific academies, funding agencies in addition to the teaching institutions.
8	MZOO202	PRINCIPLES OF ECOLOGY	**CO1:**	Students will be exposed to the fundamental aspects of ecology. They will get idea about the impact of anthropogenic activities on the environment. Students will get an idea about the natural resources and their conservation.
9	MZOO203	ANIMAL PHYSIOLOGY	**CO1:**	After going through this course on 'Animal Physiology', the students have a good understanding of how vertebrate animals work and how these animal's biology is influenced by the different environments of their niches. The students will be able to explore an original query in animal physiology. The students will appreciate evolutionary changes and environmental adaptations in different taxa of vertebrates.
10	MZOO204	Applied & Economic Zoology	**CO1:**	The study of culture techniques of various aquatic organisms helps in the production of healthy food for human consumption in a sustainable manner and also in employment generation.
11	MZOO205B	INTELLECTUAL PROPERTY RIGHTS	**CO1:**	The students once they complete their academic projects, shall get an adequate knowledge on patent and copyright for their innovative research works during their research career, information in patent documents provide useful insight on novelty of their idea from state-of-the art search.
			CO2:	This course provides further way for developing their idea or innovations.

			CO3: To Pave the way for the students to catch up Intellectual Property (IP) as a career option a. R&D IP Counsel b. Government Jobs – Patent Examiner c. Private Jobs d. Patent agent and Trademark agent e. Entrepreneur
12	MZOO301	Genetics and Immunology	**CO1:** The students will be able to understand genetic material and the design of functional modules, structurally and functionally annotate a gene from the genomic database identify the cellular and molecular basis of immune responsiveness and understand how the innate and adaptive immune responses coordinate to fight invading pathogens. Understand the immunomodulatory strategies essential for generating or suppressing immune responses as required in hypersensitivity reactions, transplantation, autoimmune diseases and cancer. Learn to review the literature to determine the strengths and weaknesses of the data published in immunology and its novelty. Design new methods to improve existing vaccines and other immunotherapeutic strategies.
13	MZOO302	Environmental Science and Toxicology	**CO1:** The students will be able to identify the Environment and biogeochemistry and their responsibilities towards nature and societies. Understand the soil, water, air pollution and their impacts on human life and environment. Also, understand the Soil Biogeochemistry and its analysis technics which help them to buildup research career in future
14	MZOO303	DEVELOPMENTAL BIOLOGY	**CO1:** Students learn best by doing and by having the opportunity to put what they have learned into practice. Therefore, using various model organism as a learning tool in Developmental Biology, students will learn how a cell behaves in response to an autonomous determinant or an external signal depends on the combination of transcriptional and posttranscriptional regulators, signaling pathway components, cytoskeletal elements, and other proteins and RNAs that it has synthesized earlier: i.e., on its developmental history. Students will also understand that cells only express a proportion of their genome, and that differential gene expression underlies cell differentiation and any alteration in the entire process of development leads to devastating diseases.
15	MZOO304A	TECHNIQUES IN BIOLOGY	**CO1:** It is expected that a student after completing this course would have fairly good understanding of instrumentation techniques and the fundamentals of instrumentation. In near future that is the most required eligibility to perform laboratory techniques in higher studies.

16	MZOO304B	Parasitology and Vector Bone Diseases	**CO1:** At the end of the course, the students should be able to understand and explain the basic terms of toxicology and parasitology. Develop the ability of appreciate and analyze the complex mechanisms regarding toxic effects and host parasitic interactions. Students should be able to outline the basic structure and functioning of bacteria, virus, fungi and protozoans. Students must know the causes, associated parasites, and prophylaxis of various common microbial diseases.
17	MZOO305A	Forest & Wildlife Conservation	**CO1:** At the completion of their Wildlife and Conservation Biology course, students will be able to understand the necessity of wildlife conservation in a better way. Indulge themselves more into the sustainable development and will understand the reason of conflict between the wild and mankind.
18	MZOO305B	ANIMAL BEHAVIOR	**CO1:** At the completion of their Animal Behavior course, students will be able to exhibit critical and integrative thinking skills about different animal activities. Demonstrate ability to communicate scientific information in both oral and written formats. Demonstrate knowledge of key concepts in animal behavior. Exhibit quantitative research skills (or demonstrate ability to perform all parts of the scientific method). Demonstrate ability to think flexibly and apply knowledge to new problem.