

Department of Zoology

Karanjia Autonomous College, Karanjia

Programme/Course/ Specific Programme outcome For the Session 2015-16

Programme Outcome	<p>This programme is one of the most fundamental units of basic sciences studied at undergraduate level. This program helps to develop scientific tempers and attitudes, which in turn can prove to be beneficial for the society since the scientific developments can make a nation or society to grow at a rapid pace. After studying this program, students will be more equipped to learn and know about different biological systems, their coordination and control as well as evolution, behavior and biological roles of animals in ecosystem. This program also provides a platform for classical genetics in order to understand the distribution and inheritance of different traits among the organisms and also the congenital disorders. It also offering the opportunity to explore the ecosystem with its different parameters and the crisis which are currently operational and that to be faced in nearby future. It also gives a platform to acknowledge the advanced modern techniques like blotting techniques, PCR, DNA fingerprinting, Centrifugation, Spectrophotometer, ELISA etc. which are being used for diagnosis of certain biomolecules related with the disease conditions. This Program also covers the ancestry of life on earth, taxonomy of animals and also anatomical comparison among the different groups of animals. After completion of this course, students have the option to go for higher studies, i.e. M.Sc/ Integrated MS Ph.D and then do research work for the welfare of mankind. After higher studies, students can join as scientists or assistant professor or assistant teacher and even can look for professional job oriented courses such as Indian Civil Services, Indian Forest Services, Odisha Civil Services, Odisha Forest Services etc. Science graduates can go to serve in industries or may opt for establishing their own industrial unit. Practical and theoretical skills gained in this program will be helpful in designing different public health strategies for social welfare. The programme has been designed to provide in depth knowledge of applied subjects ensuring the inculcation of employment skills so that students can make a career and become an entrepreneur in diverse fields.</p>
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Programme Specific Outcome	<p>Students enrolled in B.Sc. (Hons.) degree program in Zoology will study and acquire complete knowledge of disciplinary as well as allied biological sciences. At the end of graduation, they are likely to possess expertise which will provide them competitive advantage in pursuing higher studies from India or abroad; and seek jobs in academia, research or industries. They are able to correctly use biological instrumentation and proper laboratory techniques. Students will be able to communicate biological knowledge in oral and written form. Students will be able to identify the relationship or synchronization between structure and function at all levels: molecular, cellular, and organismal. Students should be able to identify, classify and differentiate diverse chordates and non-chordates based on their morphological, anatomical and systemic organization. They will also be able to describe economic, ecological and medical significance of various animals in human life. This will create a curiosity and awareness among them to explore the animal diversity and take up wild life photography or wild life exploration as a career option. The procedural knowledge about identifying and classifying animals will provide students professional advantages in teaching, research and taxonomist jobs in various government organizations; including Zoological Survey of India and National Parks/Sanctuaries. Students will be able to apply the scientific work supports their hypotheses. Acquired practical skills in biotechnology, biostatistics, bioinformatics and molecular biology can be used to pursue career as a scientist in drug development industry in India or abroad. The students will be acquiring basic experimental skills in various techniques in the fields of genetics; molecular biology; biotechnology; qualitative and quantitative microscopy; enzymology and analytical biochemistry. Students will be able to use the evidence of comparative biology to explain how the theory of evolution offers the only scientific explanation for the unity and diversity of life on earth. They will be able to use specific examples to explicate how descent with modification has shaped animal morphology, physiology, life history, and behavior. Students will be able to explain how organisms function at the level of the gene, genome, cell, tissue, organ and organ-system. Drawing upon this knowledge, they will be able to give specific examples of the physiological adaptations, development, reproduction and behavior of different forms of life. Students will be able to explicate the ecological interconnectedness of life on earth by tracing energy and nutrient flows through the environment. They will be able to relate the physical features of the environment to the structure of populations, communities, and ecosystems. Students undertaking skill enhancement courses like aquaculture, sericulture and apiculture will inculcate skills involved in rearing fish, bees and silk</p>
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PHYSIOLOGY: CONTROLLING AND COORDINATING SYSTEMS	Students will learn about basics of histology and tissue staining. They will also understand the physiology of muscles, nerves, reproductive systems and bone. They will learn details of endocrinology with classification of hormones, their biosynthesis, receptors, mode of molecular actions, physiological function, feedback controls and related disorders.
COMPARATIVE ANATOMY OF VERTEBRATE	Students will have understood the structures of different systems such as, integumentary, skeletal, digestive, respiratory, circulatory, urinogenital, nervous and sensory organs in comparative way among the vertebrate groups.
BIOCHEMISTRY OF METABOLIC PROCESSES	Students will understand the metabolism of carbohydrates, lipids and proteins in details. They will also learn about oxidative phosphorylation and redox reactions. Students will understand the basic and fundamental biochemistry of carbohydrates, proteins, lipids and nucleic acids. They will also understand the nature, mechanism, and kinetics of enzyme action. Some instrumentation such as microscopy, chromatography, electrophoresis, centrifugation, spectrophotometry etc will also be learnt
CELL BIOLOGY	Students will understand the structures, positions and functions of plasma membrane and all cellular organelles in details. They will acquire knowledge about chromosomes and cell divisions, both mitosis and meiosis. They will also know about cell signalling and cancers. They will know how to measure and stain different cell types
PRINCIPLES OF GENETICS	Students will learn the fundamental genetics like Mendelian and Non Mendelian inheritances, linkages, mutations, sex determination of various animals, extrachromosomal inheritances, transposable genetic elements etc.
ECONOMIC ZOOLOGY AND ANIMAL BEHAVIOUR	CHRONOBIOLOGY Students will know in details about patterns of behaviours, survival strategies, social and cooperative behaviours, design of signals and chronobiology
BIOTECHNOLOGY- MICROBES TO ANIMALS	Students will learn the application of technology in biological system to manipulate at gene level, genome level and protein level, the method of transgenesis and gene manipulation. They will also know the cell and tissue culture technology as well as industrial application of microbiology. The students will also know the techniques like PCR, Blotting techniques, DNA fingerprinting, electrophoresis, DNA extraction from sample and more importantly how the biotechnology is playing a vital role in pharmaceuticals, agriculture and husbandry and environment.

DEVELOPMENTAL BIOLOGY	Students will develop knowledge about structures and function of immune cells, immunoglobulins, antigens and their interactions with antibodies. They will know about MHC molecules, cytokines, hyper sensitivity reactions and cellular mode of immunity development. They will know the immune diffusion technique and ELISA.
MOLECULAR BIOLOGY	Students will acquire knowledge about replication, transcription, translation, post transcriptional and post translational modifications, gene regulation, DNA repair mechanisms and various molecular tools and techniques like PCR, southern, northern and western blotting, recombinant DNA technology etc. They will also know the various tools and techniques related to bacterial microbiology. Some aspects of applied microbiology and diseases related to microbiology will also be learnt by the students.
MICROBIOLOGY	Students will acquire the knowledge about all the microbes and their economic importance. The host- microbe interaction and the epidemiology of animal diseases can also be learnt
IMMUNOLOGY	Students will develop knowledge about structures and function of immune cells, immunoglobulins, antigens and their interactions with antibodies. They will know about MHC molecules, cytokines, hyper sensitivity reactions and cellular mode of immunity development. They will know the immune diffusion technique and ELISA.
EVOLUTIONARY BIOLOGY	Students will know about population genetics, human evolution, various concepts about origin of species, extinctions, phylogenetic tree making. They will also understand few basic of bioinformatics.

H.O.D.

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