Department Of Zoology, South East Manipur College, Komlathabi

Program Outcome/Program Specific Outcome/Course Outcome

The Department of Zoology, South East Manipur College, Komlathabi offers undergraduate course in Zoology in accordance to the prescribed curriculum of Manipur University.

Zoology is the branch of biology dealing with the study of animal kingdom including classification, structure, distribution, development, heredity, embryology and evolution of all the animals. Thus, it covers an area ranging from the structure of the organisms to the sub cellular unit of life. Our degree course has been designed in such a way as to enable the students of Zoology to pursue higher studies both in their academic and professional career. Apart from the classroom lectures and practical experiments in the laboratory, they are given the opportunity for study tours as well so as to provide them with the basic concepts, fundamental principles and scientific theories related to Zoology and its relevance in the day today life. The Department focuses on the given objectives;

- To provide the students with the proper ethical knowledge and practices relevant to Zoology
- To provide quality education and inculcate spirit of interest and love for nature with its myriad living creatures
- To impart awareness of the conservation of the biosphere
- To impart basic knowledge on various branches of Zoology for their higher studies
- To let them understand the unity of life with the rich diversity of organisms and their ecological & evolutionary significance
- To provide them with basic knowledge and skills in certain applied branches of Zoology and enable them for self employment
- To impart value based education and provide opportunities for professional and personal development through various curricular & co- curricular activities.

Programme Outcomes

PO1. Make the students knowledgeable in their concerned subjects so that they can pursue their further studies and be a qualified candidates in their career life

PO2. To help them acquire innovative ideas and necessary trainings to initiate start-ups

8/7/2017

Principal
South East Manipur College
Komlathabi

PO3. Acquire basic knowledge and skills in certain applied branches of Zoology to enable them for self employment

PO4. To develop competence in their concerned subjects of the specific courses that constitutes the principal knowledge of their degree.

PO5. Skillful in handling scientific instruments in the laboratory experiments.

PO6. Understand the nature and basic concepts of cell biology, genetics, taxonomy, physiology, ecology and applied Zoology.

Programme Specific Outcomes

PSO1. Have indept knowledge in all the branches of Zoology as well as related disciplines

PSO2. Understood the applied Zoology such as Sericulture, Apiculture, Aquaculture, Agriculture etc for their career opportunities.

PSO3. Ability to identify the major groups of animals and classify them within a phylogenetic framework.

PSO4. To develop empathetic love towards nature

PSO5. To understands and creates awareness on different environmental issues, importance of biodiversity and protection of endangered species.

PSO6.To inculcate value based education and entrepreneurial skills for self and societal benefits.

Course Outcomes

B.Sc (Zoology) First Semester

Course ZOO 101- Principles of Classification, Zoogeography and Palaezoology

CO1. Describe general taxonomic rules on animal classification

CO2. Knowledge on International Code of Zoological Nomenclature, concepts of chemotaxonomy and numerical taxonomy and molecular techniques in taxonomy

CO3. Distribution of fauna in different zoogeographical realms, different types of barriers and its significance

CO4. Identify fossil types and its significance

8/7/2017

Principal
South East Manipur College
Komlathabi

CO5. Describe geological time scale and associated fauna.

Course ZOO 101P- Practicals on Principles of classification, Zoogeography & Palaezoology

CO1. Collection of specimens by recording its recording, co-ordinate, altitude, river basin, lake, mountain range etc along with catching method, local name, description of characters and colour in fresh condition

CO2. Labeling and tagging of the specimens

CO3. Narcotization, Fixation and specimen preservation and slide preparation

CO4. Observation of organisms and drawing of the exact structures/organisms using Camera-Lucida

CO5. Measurement and description of morphometric and meristic characters of species

CO6. Identification of species/specimens using dichotomous keys.

B.Sc (Zoology) Second Semester

Course ZOO 202- Functional Anatomy of Non- Chordata

CO1. Describe the general characteristics and classification of invertebrates from the phylum Protozoa to Echinodermata

CO2. Categorize the diversity found in the invertebrate groups of animals like Arthropoda, Annelida, Mollusca and Echidermata.

CO3. Describe phylum Nematoda with examples of pathogenic nematodes

CO4. Identify some of the economically important invertebrate fauna

CO5.Describe some of the important and common protozoans, helminthes of parasite causing diseases in human being

Course ZOO 202P- Practicals on Functional Anatomy of Non- Chordata

CO1. Dissect and display of different systems of Nereis, Cockroach and Pila

CO2. Identify wet specimens of various invertebrate animals based on morphological features

CO3. Study and identification of temporary slides from different organs of the invertebrates to study the details of their structure

CO4. Identify specimens of whole mount and sections of various invertebrates.

8/7/2019
Principal
South East Manipur College
Komlathabi

B.Sc (Zoology) Third Semester

Course ZOO 303- Functional Anatomy of Chordates

CO1. Classify Chordate classification up to classes

CO2. Explain the structural organization of Hemichordata, Urochordata and Cephalochordata

CO3. Describe the morphology, habit, habitat, systematic position and various system of Petromyzon and Scoliodon

CO4. State the general characters and distribution of Lungfishes

CO5. Categorize the diversity found in the vertebrate groups of animals; Amphibia, Reptiles, Birds and Mammals.

CO6. List the various vertebrates animals in a given class

CO7. Identify Poisonous and non- poisonous snakes

CO8. Imbibe knowledge about different physiological system and their anatomical comparison between lower and higher vertebrate groups which includes integumentary system, digestive system, skeletal system, circulatory system, nervous system, urino- genital system, sense organs and endocrine glands

CO9. Classify the dentition in mammals.

Course ZOO303P- Practicals on Functional Anatomy of Chordata

CO1. Dissect and display the afferent and efferent branchial vessels V, VII, IX and X cranial nerve, internal ear and brain of Scoliodon.

CO2. Dissect the various systems of calotes and cranial nerves of Frog/ Toad

CO3. State the morphological characters of the vertebrate animals

CO4. Identify the different parts of the skeleton of the class Amphibia, Reptiles, Aves and Mammals.

CO5. Identify specimens of vertebrates provided

CO6. Identify and trace phylum and class of the provided specimens

8/7/2019

Principal
South East Manipur College
Komlathabi

B. Sc (Zoology) Fourth Semester

Course ZOO 404- Biodiversity, Environmental Biology, Applied Zoology and Computer Application

CO1. Acquire the concept of biodiversity, biodiversity hotspots and IUCN Redlist category

CO2. Understand wildlife and its conservation, implementation, in-situ & ex- situ conservation, captive breeding, biotechnological intervention

CO3. List the Sanctuaries and National Parks of India

CO4. Acquire knowledge about the various governing principles of ecology that shapes populations, communities and ecosystem

CO5. List the environmental challenges and their remedies

CO6. Illustrate the environmental pollution, toxic effects of chemicals in the environment, on human and livestock

CO7. Define the concepts of the subjects like Fisheries, Aquaculture, Apiculture and Sericulture and the tools and techniques in them

CO8. Acquire skills in basic concepts of computer, operating systems and overview of Programme languages

CO9. Application of internet and statistical bioinformatics in research.

Course ZOO 404P- Practicals on Biodiversity, Environmental Biology, Applied Zoology and Computer Application

CO1. Recording of turbidity, temperature and pH of given samples

CO2. Identification of biotic and abiotic components of pond ecosystem

CO3. Estimation of Oxygen of pond water by Winkler's method

CO4. Estimation of Carbon dioxide of pond by Phenolphthalein method.

CO5. Population study by tagging experiment

CO6. Explain the life stages of Honeybee, Silkmoth and a fish

CO7. Analyze the morphological differences among the different caste of Honeybee

CO8. Visit Wildlife Sanctuary or Zoo/National Park//any other worth visiting site and study the available animals.

8/7/2019

Principal
South East Manipur College
Komlathabi

B. Sc (Zoology) Fifth Semester

Course ZOO 505- Cell Biology and Genetics

CO1. Absorb conceptual knowledge in understanding about animal cell; its membranes, various cellular organelles of importance and signaling mechanism

CO2. Differentiate prokaryotic and eukaryotic cells

CO3. Explain cell division process and its significance

CO4. Explain Mendel's principle. Its extension and chromosomal basis and determination of gene action from genotypes to phenotype and concept of inheritance

CO5. Define the terminologies in genetics

CO6. Describe the chromosomal anomalies and associated diseases

CO7. Knowledge about various aspects of genetics; Mendelian genetics and its extension, linkage and crossing over, mutations and sex determination.

CO8. Learn about chromosomal inheritance, polygenic inheritance, recombinations and transposable genetic materials

CO9. Gain knowledge on the molecular genetic tools employed to study the genetic diversity of earth

Course ZOO 506- Evolution, Adaptation, Ethology, Biotechnology & Bioinstrumentation

CO1. Acquire knowledge about the origin of life and its evolution

CO2. Review the concept of evolution through various theories; Lamarckism, Darwinism and Neo- Darwinism

CO3. Interpret phylogenetic tree and evolutions of man through macro and micro evidences of evolution

CO4. Illustrate the presence of organisms at various zoological time scale

CO5. Gain knowledge in basic concepts of adaptations of animal to deep sea, desert and cave

CO6. Describe the structural adaptation of animals with different modes of life.

CO7. Describe the different types of animal behavior, interpreting types of communications, migration in insects and role of hormones and pheromones in them

8/7/2019

Principal
South East Manipur College
Komlathabi

CO8. Parental care in animals and courtship behavior in them

CO9. Importance of biotechnology and its importance in the present scenario

CO10. Importance of viruses, bacteria, algae and fungi in biotechnology and the techniques of animal cell culture

CO11. Gain insight into various cell/tissue culture

CO12. Elementary knowledge of genetic engineering

CO13. Understanding of in-vitro culturing of organisms and production of transgenic animals.

CO14. Skills in the techniques of Chromatography, Electrophoresis, Spectrophotometry and Centrifugation.

Course ZOO 507P- Practicals on Cell Biology and Genetics Evolution, Adaptations, Ethology, Biotechnology and Bioinstrumentation

CO1. Squash preparation of onion root tip for the study of mitosis

CO2. Temporary and permanent squash preparation of the grasshopper testis for the study of meiosis

CO3. Temporary and squash preparation of the salivary gland chromosomes of drosophila and chironomous

CO4. Study of permanent slides showing autosomes and sex chromosomes of a grasshopper and a mammal and karyotyping of chromosomes

CO5. Demonstration of Sex- Chromatin (Barr body) and mitochondria by supra vital staining (Janus green)

CO6. Study of mimicry in different insects. Parental care and different types of nests in animals

CO7. Tagging of animals using paper/aluminium and recapture to study patterns of migration

CO8. Demonstration of alcohol fermentation using yeast, soyabean fermentation and curd making using starter culture

CO9. Demonstration of oil emulsion technique in microscopy and electrophoresis in paper/gel

CO10. Preparation of standard curve of amino acid and protein (bovine serum albumin)

CO11. Separation of tissue extracts using centrifuge and measurement of cell/spore size using micrometer

8/7/2019

Principal
South East Manipur College
Komlathabi

CO12. Preparation of permanent slides on Salivary Gland Chromosomes and on the different stages of mitosis and meiosis

B. Sc (Zoology) Sixth Semester

Course ZOO 608- Animal Physiology, Endocrinology and Immunology

CO1. Define basic terms of physiology

CO2. Study comparative physiological concepts of nutrition

CO3. Explain physiological process in mammals

CO4. List and explain the various systems essential for sustenance of life such as digestive, respiratory, blood vascular, urino- genital, endocrine and nervous systems.

CO5. Illustrate the histology of endocrine glands and justify its disorders

CO6. Gain knowledge about advanced immunological techniques vital for saving life

CO7. Classify hormones and its regulations

Course ZOO 609- Developmental Biology, Histology and Biological Chemistry

CO1. Describe the principles and process of fertilization and cleavage

CO2. Describe the process of gametogenesis

CO3. Explain the early developmental stages

CO4. Explain the organogenesis of central nervous system

CO5. Discuss the regulation of metamorphosis in Anura and insects

CO6. Define the basic terms of histology and the various types of tissues

CO7. Knowledge about biochemistry of different metabolic processes including glycolysis and its regulation, gluconeogenesis, glycogenesis, beta oxidation, catabolism of amino acids and electron transport system.

Course ZOO 610- Practicals on Animal Physiology, Endocrinology, Immunology, Developmental Biology, Histology & Biological Chemistry.

CO1. Count RBC and WBC using Haemocytometer

CO2. Estimate Hemoglobin percentage of blood sample

8/7/2019

Principal
South East Manipur College
Komlathabi

CO3. Prepare Haemin crystals and coagulation of blood

CO4. Effects of isotonic, hypotonic and hypertonic solutions of erythrocytes.

CO5. Record heartbeat of Frog

CO6. Demonstrate effects of acetylcholine, atropine and epinephrine on heartbeat of Frog

CO7. Detect carbohydrate/lipid/protein in tissue sample

CO8. Separate amino acid by Paper Chromatography

CO9. Perform Calorimetric estimation of protein/ amino acid

CO10. Section cutting and stretching of ribbon from the paraffin block supplied for histology

CO11. Dissect an endocrine gland of Rat

CO12. Identify endocrinology, histology and embryology

CO13. Identify developmental stages of Frog/Chick and sections of blastula and gastrula of Chick, neurula and external gills of Frog from permanent slides.

8/7/2019

Principal
South East Manipur College
Komlathabi