DEPARTMENT OF ZOOLOGY

NABAJYOTI COLLEGE, KALGACHIA

Program Outcomes, Program Specific Outcomes and Course Outcomes for all programs offered by the department

Program Outcomes

i. One of the most fundamental units of the basic sciences studied at the undergraduate level, this curriculum fosters the growth of scientific temperaments and attitudes, which may ultimately benefit society as a whole.

ii. Students will be able to learn the principles of animal sciences and develop their understanding of the intricate relationships between different living things.

iii. They can examine the intricate relationships that exist between diverse Invertebrates and Vertebrates (animals) belonging to different phyla, as well as their distribution and interactions with the environment.

iv. Students will recognize the value of environmental conservation initiatives such as biodiversity preservation, pollution management, and endangered species protection.

v. Learn about small-scale agro-based businesses such as vermicompost preparation, sericulture, fish farming and bee farming.

vi. Following the completion of this course, students can pursue advanced degrees such as an M.Sc. or an Integrated M.Sc. or a PhD, after which they can pursue research aimed at improving human welfare.

Program Specific Outcomes

1. Students participating in the Zoology B.Sc. (Hons) program will study and gain comprehensive understanding of biological sciences.
2. They will be knowledgeable in the fundamentals of applied zoology, cell biology, genetics, taxonomy, physiology, ecology, evolution, biostatistics, bioinformatics and developmental biology.
3. They will be able to visualize the interactions between bacteria, plants, and animals.
4. They will learn the procedures of biological laboratory experiments through hands-on lab activity.
5. Recognize how the knowledge of biological sciences is vital for agriculture, aquaculture, medicine, and apiculture.
6. Acquire knowledge of research techniques, proficient communication techniques, and problem-solving techniques.
7. These will explore various career opportunities like Animal behaviorist, wildlife biologist, zoo curator, wildlife educator, zoology faculty, forensic experts, lab technicians etc.

Course Outcomes

Course	Outcomes
NON-CHORDATES I: PROTISTS TO PSEUDOCOELOMATES	This paper will let the students have a profound knowledge on basic taxonomy (systematics and classification) of Non-chordate groups. They will acquire an in-depth understanding about the various methods of identification of the fauna by their taxonomic categories. They will also learn about pseudocoelomate parasites, their life cycles, epidemiology, pathology, diagnosis, symptoms and treatments.
PRINCIPLES OF ECOLOGY	This paper will let the students learn about the basics of ecology which includes various aspects of population, species richness, , community ecology ,ecotones and types of ecosystems. A detailed knowledge on the environment and its interactions will be acquired. Knowledge on awareness of conservation of the animals and plants will be also acquired. A detailed analysis on environment is also included. They will acquire knowledge about applied ecology and conservation and management of Wildlife.
NON-CHORDATES II: COELOMATES	Identification and classification of coelomate invertebrates and their structure, the respective functions and biology of these taxonomic categories will be learnt in detail. A proper understanding of different vector-borne diseases and their life cycles, epidemiology, pathology, diagnosis, symptoms and treatments will be understood. They will also learn the basics of sericulture, apiculture and lac culture
CELL BIOLOGY	This paper is designed to teach the students about the various cell types and the respective organelles within it. The structure and functions of the organelles are also discussed in detail. The structural and functional aspect of the plasma membrane will be learnt too. A profound knowledge on the chromosomes, cell cycle and cell division alongwith various staining procedures of cells is provided through this paper.
DIVERSITY CHORDATES	This paper will let the students have a profound knowledge on basic taxonomy (systematics and classification) of chordate groups. They will acquire an in-depth understanding about the various methods of identification of the fauna by their taxonomic categories. They will also learn about the origin of tetrapoda, the links between various phyla and the progressive complexity of certain organ systems in the higher animals.

PHYSIOLOGY: CONTROLLING AND COORDINATING SYSTEMS	A proper knowledge of the physiology of the various organ systems will be dealt in detail. Students will also have knowledge on the hormones, their biosynthesis, metabolism, mode of actions, thde physiological outcomes and all the related glands and the disorders.
FUNDAMENTALS OF BIOCHEMISTRY	Students will gain proper knowledge on the organic molecules (carbohydrates, proteins, lipids and nucleic acids) of the body, their synthesis, structure, metabolism and functions. They will understand the nature, mechanism and kinetics of enzyme action.

COMPARATIVE ANATOMY OF VERTEBRATES	Proper knowledge on the structures of different organ systems as integumentary, skeletal digestive, respiratory circulatory, urinogenital, nervous and sensory organs and their comparison amongst the vertebrates.
ANIMAL PHYSIOLOGY: LIFE SUSTAINING SYSTEMS	The complete physiology of digestion, respiration, circulation and excretion will be dealt in detail.
BIOCHEMISTRY OF METABOLIC PROCESS	The metabolism of carbohydrates, lipid and proteins in details are dealt in detail. A proper knowledge on the oxidative phosphorylation is dealt in detail.
MOLECULAR BIOLOGY	Students will have a basic knowledge on nucleic acids. A proper insight on the 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. the applications of molecular biology and the various tools, techniques related to molecular biology has been discussed too.
PRINCIPLES OF GENETICS	Students will have the knowledge on the fundamentals of Mendelian and Non-Mendelian inheritances, linkages, crossing over, chromosomal mapping, polygenic inheritance, mutations, sex determination of various animals, extrachromosomal inheritances, transposable genetic elements etc. They will also learn the usage of chi-square test, linkage map and pedigree analysis.
DEVELOPMENTAL BIOLOGY	A basic introduction of the developmental biology will be given to the students. Knowledge on different aspects of early, late and post embryonic developments. They will have the knowledge about implications of developmental biology in various fields, such as in teratogenesis, stem cell biology, in vitro fertilization, cryopreservation, cord blood transfusion etc.

EVOLUTIONARY BIOLOGY	A profound knowledge of the various theories of Evolution and life's beginning will be learnt by the students. They wll also learn about the evidences of evolution, the sources of variation and the product of evolutions. Popular theories and laws related to population genetics like the Hardy-Weinberg law, natural selection, density-dependent selection, sexual selection etc will be dealt in detail. Construction of phylogenetic trees will be dealt in detail.
COMPUTATIONAL BIOLOGY AND BIOSTATISTICS	Students will learn about the importance, goals and scope of Bioinformatics. They will also learn about the biological databases and various data generation and retrieval systems. A basic knowledge of BLAST, FASTA, PAM, BLOSUM etc. will be learned. Certain Biostatistical calculations and its related test like Chi square, Z test etc. will also be learned
ENDOCRINOLOGY	A profound knowledge on the structure characteristic and transport of hormones will be given to the students. They will also know about epiphysis and the hypothalamo-hypophysial axis in detail. Hormone action and regulation at the cellular and molecular level will be discussed in detail.
PARASITOLOGY	An introduction to parasite, parasitoid, vectors, life cycle, prevalence and epidemiology will be given. Knowledge on certain parasitic vertebrates will also be given.
FISH AND FISHERIES	Students will learn the basis of classification of Pisces. They will also learn about inland fisheries, marine fisheries and the environmental factors influencing the fisheries of various geographical area. A proper knowledge of Aquaculture i.e. Polyculture, sustainable aquaculture will be given.
REPRODUCTIVE BIOLOGY	An extensive knowledge of the gonadal hormones and its mechanism, its regulation will be given. The complete histology of male and female reproduction will also be learned. Students will also learn about ART and contraceptive technologies.
WILDLIFE CONSERVATION AND MANAGEMENT	Introduction and management of wildlife and its habitat will be discussed. Various methods of population estimation and management of excessive population will be learned by the students. They will also learn about national parks, sanctuaries, protected areas and Tiger reserves of India.
ANIMAL DIVERSITY	The general characters of all the phylum from Protista to Mammalia will be learned. Adaptions for terrestrial life and flight adaptions are also learned.
ENVIRONMENT AND PUBLIC HEALTH	Impart knowledge to the students regarding environment and conservation of it, all types of ecosystem, climate change. They impart

	knowledge about waste management technologies, pollution and diseases.
INSECT VECTORS AND DISEASES	General features and feeding habits of various insects will be learned. They will also have the knowledge of insects as various disease vectors.
AQUATIC BIOLOGY	Students will learn about the origin and classification of various aquatic biomes. They will also learn the management and conservation of aquatic resources.
ANIMAL CELL BIOTECHNOLOGY	Students will learn about the basic concept and scope of biotechnology. They will also learn about the applications of biotechnology in genetic engineering, vector cloning, animal cell culture, health sector and fermentation.
HUMAN PHYSIOLOGY	Students will learn the physiology of digestion and absorption of food, nervous system, respiration, excretion, circulation and reproduction. They will also learn about the hormonal regulations of digestion and reproduction.
APICULTURE	Students will learn about the classification of honeybees. They will learn about the rearing techniques, diseases and the products of apiculture.
NON-MULBERRY SERICULTURE	Students will learn about the history of sericulture in North-east India. They will learn about the lifecycles, rearing and diseases of silkworms. They will also learn to incorporate sericulture in entrepreneurship.
ORNAMENTAL FISH & FISHERIES	Students will learn about the types and classification of various ornamental fishes. They will learn about ornamental fish keeping, set up of aquarium and maintenance.
WILDLIFE PHOTOGRAPHY & ECOTOURISM	Students will learn about photography skills and the use of various tools required in photography of wildlife. They will also learn about ecotourism and innovative ideas of eco-restoration with special reference to NE India.