DEPARTMENT OF ZOOLOGY

PANDIT DEENDAYAL UPADHYAYA ADARSHA MAHAVIDYALAYA

(A GOVT.MODEL DEGREE COLLEGE OF SCIENCE)

Dalgaon: Darrang: Assam

Estd: – 2017

Email: – pduamzoology2017@gmail.com

Date: 14/ 06 /2023

Program outcome, Program specific outcome and Course outcome

Program Outcome:

This program is one of the most fundamental units of basic sciences studied at undergraduate level. The 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 the animals in the ecosystem. Moreover, they will be able to qualitatively and quantitatively analyse evolutionary parameters using various bioinformatics and computational tools used in modern sciences. This will provide them ample opportunities to explore different career avenues. The program will also provide a platform for classical genetics in order to understand distribution or inheritance of different traits and diseases among populations, their ethnicity and correlate with contemporary and modern techniques like genomics, genome editing and molecular diagnostic tools. After the 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 scientist or assistant professor or assistant teacher and can even look for professional job oriented courses, such as Indian Civil Services, Indian Forest Service, Indian Police Service 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 program 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. After the completion of the B.Sc degree there are various other options available for the science students.

Program Specific Outcome:

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. Students will be able to define and explain major concepts in the biological sciences. 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 organism. 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 method to questions in biology by formulating testable hypotheses, gathering data that address these hypotheses, and analyzing those data to assess the degree to which their scientific work supports their hypotheses. Students will be able to present scientific hypotheses and data both orally and in writing in the formats that are used by practicing scientists. Students will be able to access the primary literature, identify relevant works for a particular topic, and evaluate the scientific content of these works. 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. These methodologies will provide an extra edge to our students, who wish to undertake higher studies. 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 moth which would help them in starting their own ventures and generating self

employment making them successful entrepreneurs. Acquired skills in diagnostic testing, haematology, histopathology, staining procedures etc. used in clinical and research laboratories will provide them opportunity to work in diagnostic or research laboratory. Candidates find opportunities in government departments, environmental agencies, universities, colleges, biotechnological, pharmaceutical, environmental/ecological fields.There are numerous career opportunities for candidates completing their B.Sc, M.Sc and Ph.D. in Zoology in public and private sector. Candidates may find jobs as Animal Behaviorist, Conservationist, Wildlife Biologist, Zoo Curator, Wildlife Educator, Zoology faculty, Forensic experts, Lab technicians, Veterinarians etc.

Course Outcome:

COURSE I: Non-Chordates I: Protists to Pseudocoelomates (ZOO-HC-1026):

Students will have learning about the basic taxonomy and systematics and classification of Protozoa, Porifera, Cnidaria and Helminth groups. They also will acquire knowledge about the biology of these taxonomic categories as well as about some acoelomate plus pseudocoelomate parasites for their life cycles, epidemiology, pathology, diagnosis, symptoms and treatments. They will also have knowledge about the basics of parasitology such as origin and evolution of parasitism, role of vectors, parasitoids, host-parasite interactions etc.

COURSE II: Principles of Ecology (ZOO-HC-1026):

Students will understand the various features and aspects of population ecology, community ecology and ecosystem ecology. They might have the knowledge about environmental biology in details. They will acquire knowledge about various tools and techniques of field ecology.

COURSE III: Non-ChordatesII: Coelomates (ZOO-HC-2016):

Students will be learning about classification of coelomate invertebrates and the structure, function and biology of these taxonomic categories as well. They will understand about different vector born diseases and the related life cycles, epidemiology, pathology, diagnosis, symptoms and treatments. They will also know the basics of sericulture, apiculture and lac culture.

COURSE IV: Cell Biology (ZOO-HC-2026):

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.

COURSE V: Diversity of Chordata (ZOO-HC-3016):

Students will understand the classification, structure, function and biology of chordates of different taxonomic classes. They will also learn some special topics like zoogeography, metamorphosis, snake bites, migration of birds, and parental care of amphibian, echolocation of mammals, poultry managements and different breeds of domestic animals.

COURSE VI: Animal Physiology: Controlling and Coordinating Systems (ZOO-HC-3026):

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, and mode of molecular actions, physiological function, feedback controls and related disorders.

COURSE VII: Fundamentals of Biochemistry (ZOO-HC-3036):

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.

COURSE VIII: Comparative anatomy of Vertebrates (ZOO-HC-4016):

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.

COURSE IX: Animal Physiology: Life Sustaining Systems (ZOO-HC-4026):

Students will gain detailed knowledge about structure and function of various mammalian body systems like respiratory, digestive, circulatory and excretory systems. They will learn about components of blood and the various functions and mechanisms associated with it. They will be able to get hands on experience on blood grouping, blood pressure measurement, and estimation of haemoglobin. Also they will develop an insight on the histological sections of the vital organs of the body.

COURSE X: Biochemistry of Metabolic Processes (ZOO-HC-4036):

Students will understand the metabolism of carbohydrates, lipids and proteins in details. They will also learn about oxidative phosphorylation and redox reactions.

COURSE XI: Molecular Biology (ZOO-HC-5016):

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.

COURSE XII: Principles of Genetics (ZOO-HC-5026):

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. They will also understand the various aspects of biostatistics such as central tendency, t-test, chi-square, ANOVA, correlations and regression.

COURSE XIII: Developmental Biology: **(ZOO-HC-6016):**

Students will gain insight into historical perspective of embryology and important concepts related to developmental biology.They will develop an idea on the early embryonic, late embryonic and post embryonic development and also develop a practical knowledge on the whole mounts of chick embryo at different time phases of incubation at different stages of development. They will be able acquire knowledge on implications of developmental biology like Teratogenesis, Invitro fertilization and Stem cell, and Amniocentesis.

COURSE XIV: Evolutionary Biology: **(ZOO-HC-6026)**

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.

Skill enhancement course: Apiculture (ZOO-SE-3024):

After study of this paper students will be able to gain knowledge about biology of Honey bees, artificial bee rearing methods of honey extraction etc.

Skill enhancement course: Sericulture (ZOO-SE-4014):

Students will learn details about biology of Mulberry and Non-Mulberry silkworm ,rearing operation of silkworms, different diseases associated with them and also entrepreneurship in non-mulberry sericulture

Discipline Centric Elective Course: Computational Biology and Biostatistics (ZOO-HE-5016):

Student will learn use of various software in the field of phylogenetic analysis and also application of different statistical softwares in biological research.

Discipline Centric Elective Course: **Biology of Insecta (ZOO-HE-6016):**

Students will learn details about taxonomy, biology and physiology of insects as well as study of different insects as vectors.

Dissertation (ZOO-HE-6056):

Dissertation on any Zoology specific subjects.

Submitted by

Dr Rimjim Dutta

Head,Department of Zoology,PDUAM,Dalgaon