Department of Zoology: Outcomes of the course
B.Sc. Zoology (General) Annual 1+1+1 System

Part - I

Paper – I - Structural Diversity of Non-chordates and Chordates

(i) Knowledge of classification of Non-chordates along with studies on various physiological functions and interactions of non-chordate organisms with type specimens.

(ii) Knowledge of classification of chordates along with studies on various physiological functions and comparative anatomy of organs of chordate with examples.

Paper – II - Biochemistry — Cell Biology – Genetics

(i) Students gain knowledge of different biomolecules and biochemical processes of cells.

(ii) Gather basic concepts of Cell Biology along with various cellular functions.

(iii) Idea about Mendelian, non-Mendelian inheritance, genetic disorder, gene mutations and sex determination.

Paper – III – Practical

(i) Students will gain skill about slide preparation, staining and mounting.

(ii) Identifications of non-chordate and chordate specimens (fresh and preserved) along with larval forms and sections.

Part - II

Paper – IV – Histology – Developmental Biology– Endocrinology & Immunology

(i) Basic concepts of histology of various organs of body.

(ii) Basic concepts of developmental biology regarding developmental processes of frog.

(iii) Gain knowledge about hormones and endocrine mechanisms.

(iv) Imparts knowledge about types of immunity, antigens-antibodies and their properties, vaccines, diseases.

Paper – V - Animal Physiology – Molecular Biology – Biotechnology & Biostatistics

(i) Students are taught the detailed concepts of circulation, respiration, the functioning of nerves of animals.

(ii) Basic concepts of Molecular Biology along with functions of DNA and RNA and study of Genetic Engineering.

(iii) Students gain knowledge about statistical analysis in biological fields.

Paper – VI – Practical

(i) Students are able to identify bones, histological sections, embryological stages of chick.

(ii) Students performed biochemical and statistical techniques.

Part - III

Paper – VII – Ecology – Evolution – Applied Zoology

(i) Imparts knowledge to the student regarding various factors of ecology, types of ecosystem, population and community characteristics and dynamics.

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(ii) Gains knowledge in the areas of animal behaviour, wildlife, biodiversity and conservation Biology.

(iii) Understands processes of fisheries, sericulture, apiculture, poultry, dairy along with crop pest management techniques.

(iv) Students gain knowledge about various disease related vectors and their impact on human.

Paper – VIII – Practical

(i) Identification of zooplanktons and phytoplanktons.

(ii) Gain skill about histological slide preparation, staining and mounting.

(iii) Students gain skill about determination of pH and quantitative analysis of blood cells.

(iv) Students are able to parasites from rectal and fecal contents of animals.

(v) Students are able to collect parasite and pest specimens.

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Zoology Programme Courses

Semester I

DSC-Paper 1 ANIMAL DIVERSITY

After successfully completing this course, the students will be able to:

(i) Develop understanding on the diversity of life with regard to non-chordates and chordates.

(ii) Classify animals on the basis of their morphological characteristics/ structures.

(iii) Develop critical understanding how animals changed from a primitive cell to a collection of simple cells to form a complex body plan.

(iv) Examine the diversity and evolutionary history of a taxon through the construction of a basic phylogenetic/ cladistics tree.

(v) Understand how morphological change due to change in environment helps drive evolution over a long period of time.

(vi) The project assignment will also give them a flavour of research to find the process involved in studying biodiversity and taxonomy besides improving their writing skills. It will further enable the students to think and interpret individually due to different animal species chosen.

Semester II

DSC Paper 2- COMPARATIVE ANATOMY AND DEVELOPMENTAL BIOLOGY OF VERTEBRATES

After successfully completing this course, the students will be able to:

(i) Develop an understanding of the evolution of vertebrates thus integrating structure, function and development.

(ii) Understand the basic plan of different organ system in different classes of vertebrates in relation to evolutionary significance.

(iii) Have an overview of the evolutionary concepts including homology and homoplasy, and detailed discussions of major organ systems.

(iv) Develop an understanding of the related disciplines, such as cell biology, neurophysiology, pharmacology, biochemistry etc.

(v) Get a flavor of research besides improving their writing skills and making them well versed with the current trends. It will further enable the students to think and interpret individually due to different aspects chosen. Develop critical understanding how a single-celled fertilized egg becomes an embryo and then a fully formed adult by going through the important processes of cell division, cell differentiation and morphogenesis.

(vi) Understand how developmental processes and gene functions within a particular tissue or organism can provide insight into functions of other tissues and organisms.

(vii) Realize that very similar mechanisms are used in very diverse organisms; and development is controlled through molecular changes resulting in variation in the expression and function of gene networks.

(viii) Understand how the field of developmental biology has changed since the beginning of it with different phases of developmental research predominating at different times.

(ix) Understand the relevance of developmental biology in medicine or its role in development of diseases.

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Semester III

DSC Paper 3- PHYSIOLOGY AND BIOCHEMISTRY

After successfully completing this course, the students will be able to:

(i) Understand the physiology at cellular and system levels.
(ii) Understand the mechanism and regulation of breathing, oxygen consumption and determination of respiratory quotient.
(iii) Understand how mammalian body gets nutrition from different biomolecules.
(iv) Understand the process of digestion and excretion.
(v) Understand the organization of nervous system and process of nerve conduction.
(vi) Understand the process of vision and hearing.
(vii) Understand the process of muscle contraction.
(viii) Learn the determination of hemoglobin content, blood groups and blood pressure.
(ix) Understand about the importance and scope of biochemistry.
(x) Understand the structure and biological significance of carbohydrates, amino acids, proteins, lipids and nucleic acids.
(xi) Understand the concept of enzyme, its mechanism of action and regulation.
(xii) Understand the basic biochemical process going inside the living cell.
(xiii) Learn the preparation of models of peptides and nucleotides.
(xiv) Learn biochemical tests for amino acids, carbohydrates, proteins and nucleic acids.
(xv) Learn measurement of enzyme activity and its kinetics.

Semester III SEC

SEC 1 Paper-1 (Group A)-APICULTURE

Upon successful completion of this course, the student should be able to:

(i) Explain what are the prerequisite to get started in apiculture
(ii) Describe the laws around apiculture
(iii) Understand the life cycle of bee, their diseases and causative agents with control measures.
(iv) Discuss the responsibilities of urban beekeepers.
(v) Identify where to purchase equipment and demonstrate how to assemble it.
(vi) Name and identify major parts of the honeybee such as the stinger or mandibular parts.
(vii) Describe bee biology and anatomy from the perspective of managing bees.
(viii) Describe the importance of wax and identify what to look for in comb during hive inspections.

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Semester IV

DSC- Paper 4 GENETICS AND EVOLUTIONARY BIOLOGY

After successfully completing this course, the students will be able to:

(i) Understand how DNA encodes genetic information and the function of mRNA and tRNA.
(ii) Apply the principles of Mendelian inheritance.
(iii) Understand the cause and effect of alterations in chromosome number and structure.
(iv) Relate the conventional and molecular methods for gene manipulation in other biological systems.
(v) Discuss and analyse the epigenetic modifications and imprinting and its role in diseases.
(vi) Get new avenues of joining research in related areas such as genetic engineering of cells, cloning, genetic disorders, human fertility programme, genotoxicity, etc.
(vii) Develop critical understanding about the evolution of different organisms over time.
(viii) Acquire an in-depth knowledge on the diversity and relationships in animal world.
(ix) Understand about the process and theories in evolutionary biology.
(x) Understand how evolutionary processes are acting on the population to produce new species.
(xi) Realize that mutations resulting in variations in the species and the role of Natural Selection in evolution.
(xii) Develop a holistic appreciation on the phylogeny and adaptations in animals.
(xiii) Understand the relevance of phylogenetic tree construction for the study of evolution.

Semester IV SEC

SEC 1 Paper-2 (Group A)-SERICULTURE

Upon successful completion of this course, the student should be able to:

(i) Understand the life cycle of silkworm, their diseases and causative agents with control measures.
(ii) Generation of skilled man power in the field of sericulture,
(iii) Impart training in extension management and transfer of technology,
(iv) Impart training in Post Cocoon Technology
(v) Describe the economic importance of silk and development of silk industries
(vi) Provide field exposure.

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Semester V

DSE- Paper 1 (Group C) AQUATIC BIOLOGY

After successfully completing this course, the students will be able to:

(i) Understand the characteristics of different types of aquatic biomes.
(ii) Understand the physico-chemical characteristics of fishes of different ecosystems.
(iii) Understand the adaptation of different aquatic organisms.
(iv) Manage the pollution of different ecosystems by checking the water quality.
(v) Understand the method and application of sewage treatment.

Semester V SEC

SEC 2 Paper-1 (Group A)-APICULTURE

Upon successful completion of this course, the student should be able to:

(i) Explain what are the prerequisite to get started in apiculture
(ii) Describe the laws around apiculture
(iii) Understand the life cycle of bee, their diseases and causative agents with control measures.
(iv) Discuss the responsibilities of urban beekeepers.
(v) Identify where to purchase equipment and demonstrate how to assemble it.
(vi) Name and identify major parts of the honeybee such as the stinger or mandibular parts.
(vii) Describe bee biology and anatomy from the perspective of managing bees.
(viii) Describe the importance of wax and identify what to look for in comb during hive inspections.

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Semester VI

DSE- Paper 2 (Group A) IMMUNOLOGY

After successfully completing this course, the students will be able to:

(i) Understand the basic concept of immunology, immune system.
(ii) Understand the components of our immune system.
(iii) Identify different antigens and able to understand the structure and function of antibodies.
(iv) Understand the processing of antigens and its presentation.
(v) Understand the role of vaccines for preventing different types of diseases.
(vi) Determine the blood groups.
(vii) Identify different types of blood cells under microscope.

Semester VI SEC

SEC 2 Paper-2 (Group A)-SERICULTURE

Upon successful completion of this course, the student should be able to:

(i) Understand the life cycle of silkworm, their diseases and causative agents with control measures.
(ii) Generation of skilled man power in the field of sericulture,
(iii) Impart training in extension management and transfer of technology,
(iv) Impart training in Post Cocoon Technology
(v) Describe the economic importance of silk and development of silk industries
(vi) Provide field exposure.

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