

B. Sc. I Course Outcomes

B. Sc. Part – I Semester – I ANIMAL DIVERSITY-I

1. Course in invertebrate animal diversity will provide students with a broad understanding of the diversity and complexity of invertebrate life, as well as the ecological, evolutionary, and conservation issues that affect them.
2. Identification and classification: Students should be able to identify the major groups of invertebrate animals and understand how they are classified based on their physical characteristics, evolutionary history, and ecological roles.
3. Environmental and conservation issues: Students should be aware of the environmental and conservation issues facing invertebrates, including habitat loss, pollution, climate change, and overexploitation, and understand the strategies used to protect them.
4. Research skills: Students should be able to apply basic research skills to study invertebrates, including data collection, analysis, interpretation, and communication, as well as ethical considerations related to animal research.

B. Sc. Part – I Semester – I ZOOLOGY (CELLBIOLOGY AND EVOLUTIONARY BIOLOGY)

1. The course aim to provide students with a solid foundation in the fundamental principles of cell biology and evolutionary biology, enabling them to understand the complex mechanisms that underlie biological processes and the evolutionary processes that have shaped life on Earth.
2. Describe the fundamental concepts and principles of cell biology, including cell structure and function, cellular communication, and molecular genetics.
3. Analyse the processes that have shaped the diversity of life on Earth, including the evolution of major groups of organisms and the origin of life.
4. Apply knowledge of cell biology and evolutionary biology to solve real-world problems, such as developing new treatments for diseases or understanding the impact of environmental change on biodiversity.

B. Sc. Part – I Semester – II Animal Diversity and Insect Vector

Describe the major systems of vertebrates, including the nervous, circulatory, respiratory, digestive, and reproductive systems.

1. Analyse the physiological adaptations of vertebrates to their environment, including their sensory and motor systems, thermoregulation, and osmoregulation.
2. Explain the ecological and behavioural adaptations of vertebrates, including their social behavior, communication, and migration.
3. Apply knowledge of vertebrate biology to solve real-world problems, such as understanding the impact of climate change on vertebrate populations or developing conservation strategies for endangered species.
4. Understand Mosquito borne diseases with respect to causal organism, life cycle and symptoms.
Ex. Malaria, Dengue, Chikungunya and Control Measures of mosquitoes.
5. Apply the knowledge of insects acts as a vector for various diseases.

B. Sc. Part – I Semester – II ZOOLOGY (GENETICS)

1. Explain the mechanisms of genetic inheritance, including the role of DNA, chromosomes, and genes.
2. Understand the genetic basis of variation, including genetic mutations, genetic recombination, and gene expression.
3. Analyse the genetic basis of human disease, including inherited disorders and genetic predispositions to complex diseases.
4. Apply knowledge of genetics to solve real-world problems, such as developing new treatments for genetic diseases or understanding the impact of genetic factors on environmental health.

B. Sc. II Course Outcomes

B. Sc. Part II Semester- III ZOOLOGY PAPER-V DSC- (ANIMAL DIVERSITY-II)

1. Describe the major systems of vertebrates, including the nervous, circulatory, respiratory, digestive, and reproductive systems.
2. Analyse the physiological adaptations of vertebrates to their environment, including their sensory and motor systems, thermoregulation, and osmoregulation.
3. Explain the ecological and behavioural adaptations of vertebrates, including their social behavior, communication, and migration.
4. Apply knowledge of vertebrate biology to solve real-world problems, such as understanding the impact of climate change on vertebrate populations or developing conservation strategies for endangered species.

B. Sc. Part II Semester- III ZOOLOGY Paper-VI DSC-BIOCHEMISTRY

1. Understand the basic principles of biochemistry, including the chemical properties of biomolecules such as proteins, carbohydrates, lipids, and nucleic acids.
2. Analyse the molecular mechanisms of gene expression, including transcription, translation, and DNA replication.
3. Understand the structure and function of enzymes and their role in catalysing biochemical reactions.
4. Evaluate the impact of biochemical processes on human health, including the effects of metabolic disorders, genetic diseases, and drug metabolism.
5. Apply knowledge of biochemistry to solve real-world problems, such as developing new therapies for diseases or designing novel biomolecules with specific properties.

B. Sc. Part II Semester- IV ZOOLOGY Paper-VII DSC-REPRODUCTIVE BIOLOGY

1. Understand the basic principles of reproductive biology, including the anatomy and physiology of the male and female reproductive systems.
2. Analyse the hormonal regulation of reproductive processes, including the role of gonadotropins, Estrogen, progesterone, and androgens.
3. Understand the mechanisms of sexual differentiation and development, including the role of sex chromosomes, sex hormones, and genetic and environmental factors.
4. Evaluate the impact of reproductive biology on human health, including the effects of infertility, contraception, and assisted reproductive technologies.
5. Apply knowledge of reproductive biology to solve real-world problems, such as developing new treatments for infertility or understanding the genetic basis of reproductive disorders.

B. Sc. Part II Semester- IV ZOOLOGY Paper-VIII DSC-APPLIED ZOOLOGY-I

1. Understand the basic principles of host-parasite relationships, including the life cycles, transmission, and pathology of parasitic infections.
2. Describe the epidemiology of infectious diseases, including the principles of disease transmission, outbreak investigation, and disease control measures.
3. Analyse the economic importance of insects, including their role as pests, vectors of disease, and beneficial organisms.
4. Understand the principles and practices of poultry farming, including the anatomy and physiology of poultry, nutrition, reproduction, and disease prevention and control.
5. Evaluate the impact of host-parasite relationships, infectious diseases, insects, and poultry farming on human health, agriculture, and the environment.
6. Apply knowledge of host-parasite relationships, epidemiology, insects, and poultry farming to solve real-world problems, such as developing new strategies for disease prevention and control, designing integrated pest management plans, or improving poultry production practices.

B. Sc. III Course Outcomes

B.Sc. Part III Paper- IX DSE-E29- Comparative Anatomy of Vertebrates

1. The course aims to provide students with a solid foundation in the anatomy and evolution of vertebrates, enabling them to understand the complex relationships between form, function, and evolution.
2. The course may also include laboratory work to provide practical experience in vertebrate dissections and comparative anatomy experiments, as well as fieldwork to study the adaptations of vertebrates to different habitats and ecological roles.
3. Students may also learn about the potential applications of comparative anatomy in fields such as medicine, palaeontology, and ecology, and explore the role of comparative biology in understanding the diversity and complexity of life on Earth.
4. Understand the evolutionary history of vertebrates, including the major events in their diversification and the relationships between different groups.
5. Analyze and interpret data from comparative evolutionary biology experiments, such as molecular phylogenetics and fossil analyses.

B.Sc. Part III Paper- X DSE-F29-Molecular Cell Biology and Animal Biotechnology

1. Understanding the structure and function of cells and their organelles, including the roles of DNA, RNA, and proteins in cellular processes.
2. Understanding the principles and techniques of genetic engineering, including recombinant DNA technology, gene editing, and transgenic animal technology.
3. Understanding the principles and techniques of biotechnology and their application in animal breeding, medicine, and agriculture.
4. Developing laboratory skills in the application of molecular biology techniques such as PCR, DNA sequencing, and gene expression analysis.
5. Developing critical thinking and problem-solving skills through the analysis and interpretation of experimental data.

B.Sc. Part III Paper- XI DSE-F30 -Biotechniques and Biostatistics

1. The course aims to provide students with a comprehensive understanding of the principles and techniques of molecular biology and biostatistics, and their application in biotechnology.
2. Students will learn about the various molecular biology techniques used in biotechnology, the principles and applications of biostatistics, and develop laboratory skills in the application of molecular biology techniques.
3. They will also develop skills in statistical analysis and interpretation of experimental data and effective communication skills for presenting experimental data and results.
4. The course may also include discussions of the ethical and regulatory considerations associated with biotechnology.

B.Sc. Part III Paper- XII DSE-F31 -AQUATIC BIOLOGY

1. Understanding the diversity of aquatic ecosystems, including freshwater and marine environments.
2. Understanding the characteristics of aquatic organisms and their adaptations to life in aquatic environments.
3. Understanding the principles and techniques of aquatic biodiversity assessment and conservation.
4. Developing laboratory and field skills in the collection, identification, and analysis of aquatic organisms and their physical and chemical environment.
5. Developing critical thinking and problem-solving skills through the analysis and interpretation of experimental data.

B.Sc. Part III Paper- XIII DSE-E30 -Developmental Biology of Vertebrates

1. Understand the basic principles of developmental biology, including cell differentiation, signalling pathways, gene regulation, and morphogenesis.
2. Understand the developmental stages and processes of different animal groups, including vertebrates and invertebrates.
3. Understand the potential applications of developmental biology in fields such as regenerative medicine, evolutionary biology, and biotechnology.
4. Evaluate the ethical implications of developmental biology research, including the use of animals in research and the implications of genetic engineering.

B.Sc. Part III Paper- XIV DSE-E32 -IMMUNOLOGY

1. Understanding the molecular and cellular mechanisms of antigen recognition, immune cell activation, and effector functions.
2. The course aims to provide students with a comprehensive understanding of the principles and concepts of immunology, including the cells, organs, and molecules involved in immune responses, and the roles of the immune system in health and disease.
3. Students will develop laboratory skills in the isolation, culture, and analysis of immune cells and tissues, as well as critical thinking and problem-solving skills through the analysis and interpretation of experimental data.
4. They will also develop effective communication skills for presenting experimental data and results, and an understanding of the ethical considerations associated with immunological research and therapy.

B.Sc. Part III Paper- XV DSE-E31 Applied Zoology – II

1. The course aims to provide students with a comprehensive understanding of the practices and principles involved in the production of animal products in specific industries.
2. Students will learn about the biology and anatomy of the animals involved, the nutritional and environmental requirements, the principles of breeding and genetics, and disease prevention and management.
3. They will also develop practical skills in animal management and understand the importance of sustainable and ethical practices in these industries.
4. The course may also include field trips and practical sessions to provide hands-on experience in the management of animals and the production of animal products.

B.Sc. Part III Paper- XVI DSE-F32 -Insect Vectors and Histology

1. Understanding the morphology and anatomy of insects and their role as vectors of human and animal diseases.
2. Understanding the principles of insect physiology, including the digestive, respiratory, circulatory, nervous, and reproductive systems.
3. Understanding the principles of immunohistochemistry and its applications in disease diagnosis and research.
4. Developing laboratory skills in the preparation and staining of histological specimens, and the identification and characterization of insect vectors.