

2023 Onwards Syllabus

B. Sc Programme Course Outcomes

Course Outcomes (Cos)

SEMESTER I

Core I (Theory) - INVERTEBRATA - I

COURSE CODE: U23ZOT101

Course Outcomes:

➤ Understand the basic concepts of invertebrate animals and recall its structure and functions.
➤ Illustrate and examine the systemic and functional morphology of various groups of invertebrata.
➤ Differentiate and classify the animal's mode of life in various taxa and estimate the biodiversity.
➤ To compare and distinguish the various physiological processes and organ systems in lower animals.
➤ Infer and integrate the parasitic and economic importance

Core II (Theory) - INVERTEBRATA II

COURSE CODE: U23ZOT102

Course Outcomes:

➤ Classify, Identify and recall the name and distinct features of invertebrate groups.
➤ Explain, and relate the origin, structural organization and evolutionary aspects of invertebrates.
➤ Analyze, compare and distinguish the developmental stages and describe the important biological process.
➤ Correlate the interaction of invertebrates with humans and critique its economic importance.
➤ Summarize the physiology, ecological adaptations to stimulate and integrate the significance of invertebrates to the environment, humans, and agriculture.

SKILL ENHANCED COURSE - APICULTURE

Course code - U23ZOS11

Course Outcomes	
CO1	Comprehend the scope of apiculture and honey bees classification
CO2	Learn bee colony and different kinds of cells
CO3	Acquire the knowledge of <i>Apis indica</i> and morphology of queen, drones and workers
CO4	Understand biological features of bee keeping
CO5	Know the nutritive value and economic importance to become potential entrepreneur

Foundation course- Parasitology

Course code - U23ZOF101

CO1	understand the general introduction about parasitism
CO2	know the morphological feature of parasites
CO3	comprehend the platyhelminthes parasitic life
CO4	acquire knowledge on nematode parasites
CO5	gain knowledge about vertebrate parasites

SEMESTER II

Core Theory - CHORDATA

Course code - U23ZOT203

CO1	Classify, Identify and recall the name and distinct features of different subphylum belonging to phylum Chordata.
CO2	Explain, and relate the origin, structural organization and Evolutionary aspects of vertebrates.

CO3	Analyze, compare and distinguish the developmental stages and describe the important biological process.
CO4	Correlate the different modes of life and parental care among different vertebrates.
CO5	Summarise the morphology and ecological adaptations in vertebrates and list out the economic importance.

Core Practical - INVERTEBRATA AND CHORDATA

Course code - U23ZOP204

CO1	Identify and label the external features of different groups of animals.
CO2	Illustrate and examine the circulatory system, nervous system and reproductive system of invertebrate/vertebrate animals.
CO3	Differentiate and compare the structure, function and mode of life of various groups of animals.
CO4	To compare and distinguish the dissected internal organs of animals.
CO5	Prepare and develop the mounting procedure of economically important invertebrates/vertebrates

SKILL ENHANCEMENT COURSE – BIOCOMPOSTING AND ENTREPRENEURSHIP

Course code - U23ZOS23B

- The students will gain knowledge about the process of Biocomposting.
- Students will be able to demonstrate Biocomposting techniques for various end applications like solid waste management, industrial waste recycling using sugarcane bagasse, etc.
- To gain knowledge about the economic cost of establishing small Biocompost units as a cottage industry.

SEMESTER III

Core Theory - CELL BIOLOGY

Course code - U23ZOT305

CO1	To understand and recall the basic structure, origin and development of cell organelles.
CO2	To integrate and assess the biochemical, cytological and Histological tools to infer cellular basis of organization.
CO3	To analyze and differentiate organisms based on structure, composition and inter and intra cellular interactions.
CO4	To explain the role of cells and cell organelles in various Biological processes.
CO5	To construct and simulate the role of different cytological tools to explain the structure and complexity of cells and cell organelles.

Core Theory – Genetics

Course Code - U23ZOT306

CO1	Understand the basis of inheritance and expression of Genes.
CO2	Correlate changes in genetic makeup and phenotypic changes in progeny.
CO3	Analyse the causes of variations in genetic material and predict the effect in a population using different techniques.
CO4	Explain the role of cellular processes and different genetic elements in the expression of genes.
CO5	Compile the factors which contribute to changes in gene expression and specify the changes which contribute to evolution.

Skill enhancement course – Aquaculture

Course code - U23ZOS34B

CO1	Understand the ideal cultivable fishes and the importance of live feed in aquaculture.
CO2	Elucidate the types of Culture systems and construction of pond.

CO3	Manage water quality, feed formulation, and disease control.
CO4	Apply modern breeding methods and identify the Govt. institutions for aquaculture development
CO5	Establish own aqua farm with the knowledge on preservation methods. marketing strategy for fishery products and value-added products in aquaculture

SEMESTER -IV

Core Theory - Developmental Biology

Course code - U23ZOT407

CO1	To describe and illustrate the significance of cellular processes in embryonic development.
CO2	To relate the factors that contribute to the developmental process, construct fate maps and illustrate the steps in morphogenesis and organogenesis.
CO3	To correlate the involvement of specific cell types in the formation of specific organs and explain the importance of morphogens.
CO4	To distinguish between the different types of developmental mechanisms in various organisms and appraise the species-based differences in development.
CO5	To justify and validate the role of environment and genetics in influencing embryonic development

Core Practical - Practical in Cell Biology, Genetics and Developmental Biology

Course code - U23ZOP40

CO1	To encourage students to interpret the organization of genomic material and to research theories of genetic inheritance.
CO2	To impart the skills required to prepare samples of genetic molecules and to determine their purity, structure and characteristics and to analyze genomic preparations.
CO3	To study the changes in genetic material and to predict and consider the consequences of those changes.
CO4	To encourage students to report and justify the results of molecular and genetic experiments in an accurate and meaningful manner.
CO5	To gain knowledge about different stages of frog embryo, Chick

Skill enhancement course – Sericulture

Course code - U23ZOS45A

CO1	Describe the economic impacts and income generation by sericulture.
CO2	Educate the students about the basic biology of Mulberry culture.
CO3	Expertise in the taxonomy, morphology and life cycle of the silkworm.
CO4	Relate the strategies involved in the sericulture management system
CO5	Acquired the knowledge about the technologies in sericulture

SEMESTER – V

Core Theory – Animal Physiology

Course code - U23ZOT509

CO1	Be able to explain how the various organ systems are coordinated and controlled.
CO2	Be able to list the functions of various organs in relation to physiological process.
CO3	be able to develop the idea of multi-level controlling and feedback mechanism in relation to various physiological functions.
CO4	Be able to understand the basic physiological process related to adaptation, metabolism and major requirements.
CO5	be able to correlate and understand human physiology.

Core Theory – Microbiology

Course code -U23ZOT510

CO1	To understand history, relevance of microbiology and classification of bacteria
CO2	To understand the working of various microscopes and their application
CO3	To gain knowledge of various (physical and chemical) methods of control of microorganisms and safety measures to be followed while handling microbes
CO4	To understand the structure of bacterial cells, its organelles, physiology and behaviour.
CO5	To learn different methods of staining bacteria and demonstrate proficiency

	in handling aseptic bacteriological specimen.
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Core Theory - BIOCHEMISTRY AND IMMUNOLOGY

Course code - U23ZOT511

CO1	gain basic knowledge on biomolecules
CO2	understand the biological importance and metabolism of carbohydrate
CO3	get thorough knowledge on the metabolism and importance of aminoacids
CO4	acquire the knowledge of auto immune diseases
CO5	attain the knowledge to understand the structure and function of immunoglobulin

Core Practical - Practical in Animal Physiology, Microbiology, Biochemistry and Immunology

Course code - U23ZOP512

CO1	analyze the various stages of cell divisions
CO2	understand the various stages of embryo development
CO3	learn and interpret the development and evolution process
CO4	develop skill in observing, analyzing and calculating various biological data
CO5	gain knowledge on Mendelian characters, probability tests and Biostatistical calculation

Elective I – Animal Behaviour

Course code - U23ZOE51A

CO1	Recall and record genetic basis and evolutionary history of behaviour.
CO2	Classify movement and migration behaviors and explain environmental influence upon behaviour.

CO3	Analyze and identify innate, learned and cognitive behavior and differentiate between various mating systems.
CO4	Assess complexity involved in behavioural traits and evaluate hormones and their role in aggression and reproduction
CO5	Discuss the rhythmicity of behavioural expressions and the scientific concepts in behavior and behavioral ecology.

Elective II - Biophysics and Biostatistics

Course code - U23ZOE52A

CO1	Understand and recall the basic biophysical concepts, statistical data and formula.
CO2	Apply suitable physical techniques and statistical methods to solve biological problems.
CO3	Identify and relate the bio analytical techniques and statistical principles for the application of biological experiments.
CO4	Select suitable biophysical techniques to study the biological process and statistical approach to assess the experimental results.
CO5	Integrate the bio analytical techniques and statistical methods to validate research investigations

SEMESTER VI

Core Theory – Biotechnology

Course code - U23ZOT613

CO1	To describe the methodologies for handling animal cells based on their diverse characteristics and identify the correct biotechnological tools to obtain the desired products from the cells.
CO2	To develop and explain the protocols for genetically manipulating cells

	and produce transgenic animals
CO3	To select the apt molecular techniques to evaluate and analyze animal traits and diseases at the genomic level and devise methods for easy taxonomical identification and classification for biodiversity and environmental studies.
CO4	To choose the correct methods of transgenesis and to consider their use in improving animal husbandry nationally and globally
CO5	To speculate on the environmental implications of animal biotechnological methods and design responsible, ethical solutions to livestock production and health issues.

Core Theory - ENVIRONMENTAL BIOLOGY and EVOLUTION
Course code - U23ZOT614

CO1	Understand the fundamental structure and functions of the ecosystem.
CO2	Assess the inter-relationship between organisms and between biotic and abiotic factors in an ecosystem.
CO3	Analyze the factors that cause pollution, climate change, loss of biodiversity and depletion of resources.
CO4	Evaluate the impact of human population growth and socio-economic development on the structure and function of the ecosystem.
CO5	Design plans to scientifically solve environmental problems using biological tools, technologies and government policies.

**CORE PRACTICAL - PRACTICAL IN BIOTECHNOLOGY, ENVIRONMENTAL
BIOLOGY AND EVOLUTION**
Course code - U23ZOP615

CO1	Gain the knowledge about various biotechnology techniques.
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CO2	practice water quality analysis
CO3	Gain knowledge on animal population methods
CO4	Gain the knowledge about evolutionary adaptation of animals.
CO5	Interpret the diagnostic tests with healthcondition.

Elective Course – Bioinformatics

Course code - U23ZOE63A

CO1	able to know the history development and types of computers
CO2	understand the programming languages
CO3	apply the knowledge of sequence alignment tools
CO4	understand the uses of nucleic acid and protein data banks
CO5	know the applications of evolutionary analysis

Elective course – Bioinstrumentation

Course code - U23ZOE64A

CO1	To describe and explain the steps in the use of various biological instrumentation those are used in the study of different animal specimens.
CO2	To relate the applications of biological techniques and employ them for the study of cells, tissues and genetic material.
CO3	To correlate and appraise the use of specific bioinstrumentation for specific biological experiments and infer the results of such experiments.
CO4	To compare the working principle of different bioinstrumentation and to summarize their applications.
CO5	To devise experiments and justify them with the understanding of the underlying principles of bioinstrumentation that are ecofriendly, ethical and have national and global relevance