

Programme matrix bachelor of science- Chemistry, Botany, Zoology R-NEP

I Semester			
Course type	Course code	Course title	Course outcomes
	DSCIA	Animal diversity -I	CO1 : Explain the general characters and classification of major invertebrate groups. CO2 : Describe the morphology, anatomy, and organ systems of representative invertebrate groups through type studies. CO3 : Analyze the diversity and comparative characteristics of non-chordate groups based on their classification and evolutionary relationships. CO4 : Apply ecological, molecular, and wildlife assessment techniques through field visits and laboratory experiments to analyze ecosystems, assess environmental quality, and promote biodiversity conservation.
II Semester			
	DSCIB	Animal diversity -II	CO1 : Explain the general characteristics and classification of vertebrates. CO2 : Describe the morphology, anatomy, and organ systems of representative vertebrates through type studies. CO3 : Apply the adaptations, migration patterns, and comparative anatomy of the brain, kidney, and heart among different vertebrate groups.

			CO4: Apply practical skills to identify, classify, and analyze chordate diversity, comparative anatomy, osteology, organ systems, and bird diversity through laboratory and field studies.
III Semester			
	DSCIC	Biochemistry and Physiology	CO1 : Explain the structure, properties, and functions of biomolecules and enzymes. CO2 : Explain the physiology of major organ systems and the mechanisms involved in maintaining homeostasis. CO3 : Apply biochemical and physiological principles to analyze metabolism and normal body functions. CO4: Apply biochemical and physiological laboratory techniques to analyze biomolecules, enzyme activities, blood, urine, and physiological parameters.
IV Semester			
	DSCID	Cell biology and Developmental biology	CO1 : Explain the structure and functions of cells, cell organelles, and the cell cycle. CO2 : Explain the mechanisms of cell division, fertilization, embryonic development, and organogenesis. CO3 : Apply the principles of cell and developmental biology to understand growth, differentiation, and developmental regulation. CO4: Apply microscopy and laboratory techniques to analyze cell division, chromosomes, and embryonic developmental stages in animals. evelopmental regulation

	ELECTIVE	APPLIED ZOOLOGY	CO1: Explain the principles, scope, and importance of sericulture, and apiculture as sustainable cottage industries CO2: Describe the biology, life cycles, management practices, diseases, products, and economic importance of silkworms, and honeybees CO3: Apply scientific principles and management techniques in sericulture, and apiculture for sustainable production and rural entrepreneurship CO4 :Identify silkworm stages, silk cocoons, diseases, pests, and demonstrate silkworm rearing practices.
V Semester			
	DSCIE-I	Genetics and Animal Biotechnology	CO1: Explain the principles of genetics, heredity, and molecular genetics. CO2: Describe gene manipulation techniques and applications of animal biotechnology. CO3: Apply genetic and biotechnological tools in animal improvement, research, and healthcare. CO4: Apply genetic and biotechnological techniques in animal studies.

	DSCIE -II	Ethology, Evolution and Biostatistics	CO1 : Explain the principles of animal behavior, evolution, and adaptation. CO2 : Apply basic biostatistical methods to collect, analyze, and interpret biological data. CO3 : Analyze evolutionary mechanisms, animal behavioural patterns, and population genetics. CO4: Analyze behavioural and evolutionary data using statistical techniques.
	COMPULSORY PAPER	Skill Enhancement in Zoology	CO1: Identify and describe honeybee species, castes, morphology, and beekeeping equipment. CO2: Demonstrate honey purity tests, bee mouthpart mounting, and basic apiculture techniques. CO3: Identify silkworm stages, silk cocoons, diseases, pests, and demonstrate silkworm rearing practices. CO4: Explain vermiculture and vermicomposting techniques, their importance, and management of vermicompost predators.
VI Semester			
	DSCIF-I	Environmental Biology ,Wildlife Management and Conservation	CO1 : Explain the concepts of environmental biology, ecosystems, and biodiversity. CO2 : Explain the causes and effects of environmental pollution, climate change, and their impacts on wildlife. CO3 : Apply wildlife management and conservation principles for sustainable biodiversity protection. CO4: Demonstrate practical skills in ecology, environmental analysis, wildlife observation, and molecular biology through ecosystem studies, water quality assessment, specimen identification, and basic laboratory techniques

	DSCIF-II	Molecular Biology and Immunology	CO1 : Explain the principles of molecular biology, gene expression, and protein synthesis. CO2 : Explain molecular techniques, immune responses, and the mechanisms of antigen–antibody interactions. CO3 : Apply molecular and immunological techniques in disease diagnosis, research, and biotechnology. CO4: Demonstrate practical skills in ecology, environmental analysis, wildlife observation, and molecular biology through ecosystem studies, water quality assessment, specimen identification, and basic laboratory techniques.
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