Course Outcomes – Program Outcomes (COPO) Mapping

Program Outcomes (PO): B.Sc. (H) Zoology

Undergraduate Curriculum Framework (UGCF)

National Education Policy (NEP)

The Preamble of the Undergraduate Curriculum Framework-2022 underlines the historical perspective, philosophical basis, and contemporary realities of higher education as enshrined in the National Education Policy 2020 and endeavours to synchronize these cornerstones while charting the road ahead for the state of higher education.

ABBREVIATION/NOMENCLATURE

Sno.	Nomenclature	Description	Aggregate Courses
1	PO	Program Outcome	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8, PO9
2	CO	Course Outcome	CO1, CO2, CO3. CO4, CO5, CO6, CO7, CO8
3	DSC	Core Courses	DSC1, DSC2, DSC3……DSC14
4	DSE	Discipline Specific Electives	DSE1, DSE2, DSE3, DSE4
5	GE	General Electives	GE1, GE2, GE3, GE4

Sno.	Program Outcomes (PO): B.Sc. (H) Zoology	Statements
1.	PO1	Students enrolled in B.Sc. (Hons.) degree program in Zoology will study and acquire complete knowledge of disciplinary as well as allied biological sciences. They should possess expertise which will provide them competitive advantage in pursuing higher studies from India or abroad; and seek jobs in academia, research or industries.
2.	PO2	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.
3.	PO3	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.
4.	PO4	Acquired practical skills in biotechnology, biostatistics, bioinformatics and molecular biology, genetics, qualitative and quantitative microscopy, Enzymology and analytical Biochemistry. can be used to pursue a career as a scientist in India or abroad. These methodologies will provide an extra edge to our students, who wish to undertake higher studies.
5.	PO5	In-depth knowledge and understanding about comparative anatomy and developmental biology of various biological systems; and learning about the organisation, functions, strength and weaknesses of various systems will let students critically analyse the way evolution has shaped these traits in the human body.
6.	PO6	Students undertaking skill enhancement courses would help them in starting their own ventures and generating self-employment making them successful entrepreneurs.

7.	**PO7**	Acquired skills used in clinical and research laboratories will provide them opportunity to work in diagnostic or research laboratories.
8.	**PO8**	Deep understanding of different physiological systems and methods available to measure vital physiological parameters and to comprehend the mechanism behind occurrence of different life-threatening diseases via laboratory examination, assessment of basic physiological functions by interpreting physiological charts will help to find their career options.
9.	**PO9**	Students undertaking wildlife management courses would gain expertise in identifying key factors of wildlife management and be aware about different techniques of estimating, remote sensing and Global positioning of wildlife. This course will motivate students to pursue a career in the field of wildlife conservation and management.

Course Outcomes (CO): B.Sc. (H) Zoology

SEMESTER 1:
DSC1: Non-Chordates I: Protists to Pseudocoelomates

Unique Paper Code	Name of the Paper	Course Outcome: CO	Statement
2232011101	Non-Chordata Protists to Pseudocoelomates	CO1	ltudents will Learn about the importance of systematics, taxonomy and structural organization of animals.
		CO2	Appreciate the diversity of non-chordates living in varied habit and habitats.
		CO3	Understand evolutionary history and relationships of different non-chordates through functional and structural affinities.

		CO4	Critically analyse the organization, complexity and characteristic features of non-chordates making them familiarize with the morphology and anatomy of representatives of various animal phyla.
		CO5	Comprehend the economic importance of non-chordates, their interaction with the environment and role in the ecosystem.
		CO6	Enhance collaborative learning and communication skills through practical sessions, team work, group discussions, assignments and projects.
DSC2: Biology of Cell: Structure and Function			
2232011102	**Biology of Cell: Structure and Function**	CO1	Students will understand fundamental principles of cell biology
		CO2	Explain structure and functions of cell organelles involved in diverse cellular processes.
		CO3	Appreciate how cells grow, divide, survive, die and regulate these important processes.
		CO4	Comprehend the process of cell signalling and its role in cellular functions.
		CO5	Have an insight of how defects in functioning of cell organelles and regulation of cellular processes can develop into diseases.
DSC3: Concept of Ecology			

2232011103	DSC3: Concept of Ecology	CO1	Students will be able to demonstrate an understanding of the basic concepts of the subject
		CO2	Explain the characteristics, dynamics, and growth of populations
		CO3	Understand the characteristics of the community, ecosystem development and climax theories
		CO4	Gain knowledge about the relationship of the evolution of various species and the environment they live in.
		CO5	Design basic field studies, collect data and interpret it
		CO6	Carry out population and community studies
GE: Generic Elective **GE1: Human Physiology**			
UPC	Name of the Paper	Course Outcome: CO	Statement
2234001001	Human Physiology	CO1	Understand the principles of normal biological function in the human body.
		CO2	Outline basic human physiology and correlate it with histological structures.
		CO3	Understand the homeostasis in animals in response to changes in their external environment.

COPO MAPPING

	SEMESTER I: COPO MAPPING									
Papers	Program Outcome: PO									
	Course Outcome: CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
DSC1	CO1	✓	✓							
	CO2	✓	✓							
	CO3	✓	✓							
	CO4	✓	✓							
	CO5	✓	✓							
	CO6	✓	✓							
DSC2	CO1	✓			✓	✓				
	CO2	✓			✓	✓				
	CO3	✓			✓	✓				
	CO4	✓			✓	✓				
	CO5	✓			✓	✓				
DSC3	CO1	✓	✓							
	CO2	✓	✓							
	CO3	✓	✓	✓						
	CO4	✓	✓	✓						
	CO5	✓	✓	✓						
	CO6	✓	✓	✓						
GE1	CO1	✓						✓	✓	
	CO2	✓						✓	✓	
	CO3	✓					✓		✓	

SEMESTER II: DSC4: Non-Chordata: Coelomates			
Unique Paper Code	**Name of the Paper**	**Course Outcome: CO**	**Statement**
2232011201	Non-Chordata: Coelomates	CO1	Students will be able to learn about the importance of systematics, taxonomy, and structural organization of non-chordate coelomates.
		CO2	Recognize the diversity of non-chordates living in varied ecological habitats
		CO3	Critically analyse the organization, complexity and characteristic features of non-chordates.
		CO4	Comprehend the economic importance of non-chordates, their interaction with the environment and their role in the ecosystem. •
		CO5	Enhance collaborative learning and communication skills through practical sessions, teamwork, group discussions, assignments, and projects.
DSC5: Fundamentals of Biomolecules			
2232011202	Fundamental of Biomolecules	CO1	Students will be able to interpret the structure-functional relationships of carbohydrates, proteins, lipids and nucleic acids.
		CO2	Understand the qualitative analysis of functional groups
		CO3	Understand the properties of various

			biomolecules.
		CO4	Appreciate the action of the enzyme and the various factors that affect their action detail.
DSC 6: Human Physiology Control and Coordination Systems			
2232011203	Human Physiology Control and Coordination Systems	CO1	Students will be able to appreciate human physiology and have its enhanced knowledge.
		CO2	Recognize and identify principal tissue structures and functions
		CO3	Understand the functions of important physiological systems including the nervous system, muscular system, endocrine and reproductive system
		CO4	learn an integrative approach to understand how these separate systems interact to yield integrated physiological responses to maintain homeostasis in the body along with feedback mechanisms.
		CO5	Synthesize ideas to make the connection between knowledge of physiology and real world situations, including healthy lifestyle decisions and problems faced due to homeostatic imbalances
		CO6	Perform, analyze and report on experiments and observations in physiology
		CO7	Know the fundamentals and understand advanced concepts so as to develop a strong foundation that will help them to acquire skills and knowledge to pursue an advanced degree.
GE2: Economic Zoology			
UPC	Name of the Paper	Course Outcome: CO	Statement
2234001205	Economic	CO1	Students will be able to develop an

	Zoology		understanding of the beneficial higher and lower organisms in terms of economic prospective.
		CO2	Aquatic organisms and agriculturally important insect pests based on their morphological characteristics/structures.
		CO3	Develop a critical understanding of the contribution of organisms to the welfare of society.
		CO4	Examine the diversity of insect pests of different orders in the agro-ecosystem and sustainable pest management strategies.

COPO MAPPING

	SEMESTER 2: COPO MAPPING									
Papers	Program Outcome: PO									
	Course Outcome: CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
DSC4	CO1	✓	✓	✓						
	CO2	✓	✓	✓						
	CO3	✓	✓	✓						
	CO4	✓	✓	✓						
	CO5	✓	✓	✓						
DSC5	CO1	✓			✓					
	CO2	✓			✓					
	CO3	✓			✓					
	CO4	✓			✓					
DSC6	CO1	✓							✓	
	CO2	✓						✓	✓	

	CO3	✓						✓	✓	
	CO4	✓						✓	✓	
	CO5	✓						✓	✓	
	CO6	✓						✓	✓	
	CO7	✓						✓	✓	
GE2	CO1	✓	✓							✓
	CO2	✓	✓							✓
	CO3	✓	✓							✓
	CO4	✓	✓							✓

SEMESTER 3:

DSC7: Diversity of Chordates

Unique Paper Code	Name of the Paper	Course Outcome: CO	Statement
2232011301	Diversity of Chordates	CO1	Students will be able to correlate the importance of systematics, taxonomy, and structural organization of chordates
		CO2	Recognize the diversity of chordates living in varied ecological habitats
		CO3	Critically analyse the organization, complexity and characteristic features of chordates.
		CO4	Comprehend the economic importance of chordates, their interaction with the environment and their role in the ecosystem.
		CO5	Enhance collaborative learning and communication skills through practical sessions, teamwork, group discussions, assignments, and projects.

DSC8: Biochemistry: Metabolic Processes			
2232011302	Biochemistry: Metabolic Processes	CO1	Students will be able to interpret the structure-functional relationships of carbohydrates, proteins, lipids and nucleic acids
		CO2	Understand the clinical knowledge and importance of antioxidants.
		CO3	Understand the process of biological oxidation crucial to generation of energy for a living cell.
		CO4	Appreciate the action of various types of enzymes under variety of conditions.
DSC9: Human Physiology: Life Sustaining Systems			
2232011303	Human Physiology: Life Sustaining Systems	CO1	Appreciate human physiology and have its enhanced knowledge
		CO2	Recognize and identify principal and physiology of digestion.
		CO3	Understand the functions of important physiological systems including the digestive, circulatory, renal and respiratory system.
		CO4	Learn an integrative approach to understand how these separate systems interact to yield integrated physiological responses to maintain homeostasis in the body along with feedback mechanisms.

		CO5	Amalgamate ideas to make the connection between knowledge of physiology and real-world situations, including healthy lifestyle decisions and problems faced due to homeostatic imbalances
		CO6	Perform, analyze and report on experiments and observations in physiology.
		CO7	Know the fundamentals and understand advanced concepts so as to develop a strong foundation that will help them to acquire skills and knowledge to pursue an advanced degree.
GE3: Food Nutrition and Health			
UPC	Name of the Paper	Course Outcome: CO	Statement
2234002001	GE3: Food Nutrition and Health	CO1	Students will be able to have an in-depth understanding of the dietary sources and role of nutrients in forming a balanced diet.
		CO2	Appreciate the concept of nutritional requirements for different age groups and in pregnancy and lactation.
		CO3	know about the various food allergens and the body's hypersensitivity towards it.
		CO4	Understand the concept of health and role of various nutrients in mitigating several

			deficiency disorders.
		CO5	Identify and analyse the causes of malnutrition, lifestyle-related disorders, addiction-related social health problems and eating disorders
		CO6	Appreciate the various techniques from identification of adulterants, estimation of essential nutrients in food products, to measurement of vital anthropometric indicators of health, as widely used by practitioners.
DSE: Discipline Specific Elective **DSE 1: Wildlife Conservation &Management**			
UPC	Name of the Paper	Course Outcome: CO	Statement
2233012004	DSE 1: Wildlife Conservation &Management	CO1	Students will be able to appreciate wildlife in general and realize its conservation and management in particular.
		CO2	Better understand the application of the principles of ecology and animal behaviour to formulate strategies for the management of wildlife populations and their habitats.
		CO3	Understand the management practices required to achieve a healthy ecosystem for wildlife population along with emphasis on conservation and restoration.
		CO4	Comprehend the key factors for loss of wildlife and important strategies for their in situ and ex situ conservation
		CO5	Recognize the techniques for estimation, remote sensing and Global Position Tracking for wildlife.
		CO6	Gain knowledge about the wildlife diseases and the quarantine policies.

		CO7	Know about the Protected Area Networks and Ecotourism in India.
		CO8	Perform critical thinking, literature review; scientific writing as well as presentations; and participation in citizen science initiatives with reference to wildlife.

COPO MAPPING

	SEMESTER 3: COPO MAPPING									
Papers	Program Outcome: PO									
	Course Outcome: CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
DSC7	CO1	✓	✓	✓						
	CO2	✓	✓	✓						
	CO3	✓	✓	✓						
	CO4	✓		✓						✓
	CO5	✓		✓						✓
DSC8	CO1	✓			✓	✓				
	CO2	✓			✓	✓				
	CO3	✓			✓	✓				
	CO4	✓			✓	✓				
DSC9	CO1	✓						✓	✓	
	CO2	✓						✓	✓	
	CO3	✓						✓	✓	
	CO4	✓						✓	✓	
	CO5	✓						✓	✓	
	CO6	✓						✓	✓	

	CO7	✓						✓	✓	
GE3	CO1	✓					✓		✓	
	CO2	✓					✓		✓	
	CO3	✓					✓		✓	
	CO4	✓					✓		✓	
	CO5	✓					✓		✓	
	CO6	✓					✓		✓	
DSE1	CO1	✓	✓							✓
	CO2	✓		✓						✓
	CO3	✓		✓						✓
	CO4	✓		✓						✓
	CO5	✓		✓						✓
	CO6	✓		✓						✓
	CO7	✓		✓						✓
	CO8	✓		✓						✓

SEMESTER IV:

DSC10: Comparative Anatomy of Vertebrates

Unique Paper Code	Name of the Paper	Course Outcome: CO	Statement
2232012401	DSC10: Comparative Anatomy of Vertebrates	CO1	Students will be able to have a better understanding of the evolutionary significance of comparative anatomy.
		CO2	Understand the importance of morphology and anatomy of organisms

			in relation to evolution.
		CO3	Appreciate the comparative anatomy among vertebrates that provides evolutionary evidences.
		CO4	Enhance collaborative learning and communication skills through practical sessions, teamwork, group discussions, assignments, and projects
DSC11: Developmental Biology			
2232012402	DSC11: Developmental Biology	CO1	Students will be able to appreciate the events that lead to the formation of a multicellular organism from a single fertilized egg.
		CO2	Better understand the general patterns and sequential developmental stages during embryogenesis.
		CO3	Gain knowledge of the general mechanisms involved in morphogenesis
		CO4	Comprehend the processes of ageing to improve the overall health and quality of life in aged people.
		CO5	Acquire basic knowledge and importance of latest techniques like stem cell therapy, in vitro fertilization and amniocentesis etc
		CO6	Develop the skill to raise and maintain culture of model system- Drosophila in the laboratory
DSC12: Animal Behaviour			
2232012403	DSC12: Animal Behaviour	CO1	Students will be able to comprehend various types of animal behaviour and their importance.
		CO2	Observe, analyse, interpret and document the different types of

			behaviour
		CO3	Enhance their skills by taking short projects pertaining to Animal behaviour
		CO4	Appreciate and develop passion to biodiversity; and respect the nature and environment.
		CO5	Better understand and relate the fundamentals and advanced concepts so as to develop a strong foundation that will enable them to acquire skills and knowledge.
DSE2: Parasitology			
2233012008	DSE2: Parasitology	CO1	Students will be able to better understand the variation amongst parasites, parasitic invasion in animals; applicable to medical and agriculture aspects.
		CO2	Identify the stages of the life cycles of parasites and their respective infective stages. develop ecological model, on the base knowledge of population dynamics of parasites.
		CO3	Comprehend the different methods adopted by parasites to combat with the host immune system.
		CO4	Develop skills and realize significance of diagnosis of parasitic attack and treatment of patient or host
		CO5	Analyse and interpret the case studies to highlight innovative researches, serendipities towards the advancement and enrichment of knowledge in the field of Parasitology.

COPO MAPPING

	SEMESTER 4: COPO MAPPING									
Papers	Program Outcome: PO									
	Course Outcome: CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
DSC10	CO1	✓		✓						
	CO2	✓		✓						✓
	CO3	✓	✓	✓						
	CO4	✓	✓	✓						✓
DSC11	CO1	✓				✓				
	CO2	✓				✓				
	CO3	✓				✓				
	CO4	✓				✓				
	CO5	✓				✓				
	CO6	✓				✓				
DSC12	CO1	✓		✓						✓
	CO2	✓		✓						
	CO3	✓		✓						✓
	CO4	✓		✓						
	CO5	✓		✓		✓				
DSE2	CO1	✓	✓					✓		
	CO2	✓	✓					✓		
	CO3	✓	✓					✓		
	CO4	✓						✓		
	CO5	✓					✓	✓		