



KHALISANI MAHAVIDYALAYA
Khalisani, Chandannagar, Hooghly
West Bengal

DEPARTMENT OF ZOOLOGY

PROGRAMME	SUBJECT	PROGRAMME OUTCOME (PO)
B.Sc. 3 -YEAR DEGREE (General) CBCS	Zoology	<ul style="list-style-type: none">➤ Students gain a comprehensive knowledge of animal diversity, taxonomy, and classification of non-chordates and chordates with their structural organization, adaptive features, and evolutionary relationships.➤ Understand the anatomy of vertebrates.➤ Gain knowledge of embryonic development of life and the role of fundamental processes in controlling the development.➤ Students will correlate the different physiological processes of animals and the relationship between organ systems.➤ Understands biomolecules and their metabolism in the human body.➤ Gain knowledge of Agro-based industries in India like Apiary, production of silk (Sericulture), Poultry farming, and Induce breeding in fish farming technology.➤ Understand the biology of various Insects and different types of host-parasite interactions in nature.➤ Apply scientific knowledge in the epidemiology of several diseases caused by various bacteria, viruses, protozoa, and helminths in day-to-day life.

PROGRAMME	SUBJECT	PROGRAMME OUTCOME (PO)
		<ul style="list-style-type: none"> ➤ Understand genetics, chromosomal mapping, and the importance of genetic mechanisms in evolution and human health. ➤ Students will have a concept of the different evolutionary processes, extinction, and speciation. ➤ Students will gain knowledge of the body's defense mechanism against foreign antigens, the immune system in detail, and also its key role in various types of hypersensitivities, autoimmunity, and immunodeficiency diseases. ➤ Students develop various practical knowledge both in the laboratory and also in the field in several domains like taxonomic identification and characterization of animals, identification of poisonous and non-poisonous snakes, comparative anatomy, developmental biology and histological study skills in vertebrates, qualitative physio-chemical analysis of bio-molecules especially carbohydrates and proteins, analyze data using appropriate statistical methods, Mendelian genetics & its derivatives, fossil study & analysis, Human karyotyping, parasitology, and diagnostics methods used for analysis of blood. ➤ Students will be able to apply their knowledge of zoology in their own lives, future studies, and for the benefit of humanity. ➤ Students will develop empathy and love for animals and the environment.



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DEPARTMENT OF ZOOLOGY

PROGRAMME	SUBJECT	PROGRAMME SPECIFIC OUTCOME (PSO)
B.Sc. 3 -YEAR DEGREE (General) CBCS	Zoology	<ul style="list-style-type: none">➤ Understand the nature and basic concepts of taxonomy, comparative vertebrate anatomy, physiology, cell biology, genetics, evolutionary biology, applied zoology, developmental biology, immunology, apiculture, and sericulture.➤ Develop a basic understanding of research, handling equipment, and experiments in a biological laboratory.➤ Apply the skills and practical knowledge of zoology as per laboratory standards in the fields of taxonomy, cell biology, physiology, genetics, applied zoology, clinical science, apiculture, sericulture, biochemistry, fish biology, immunology and research methodology in future studies.➤ Contribute scientific knowledge to improve the quality of life and human welfare.



KHALISANI MAHAVIDYALAYA

DEPARTMENT OF ZOOLOGY

COURSE OUTCOME

3-Year Degree in Zoology

Under the Choice Based Credit System (CBCS)

With effect from 2017-18

PROGRAM	SEMESTER	COURSE NAME	COURSE DETAIL	CREDIT	COURSE OUTCOME	CROSS CUTTING ISSUES	METHOD OF CURRICULUM DELIVERY
B.Sc. (General) Subject: Zoology	I	CC-I	Animal Diversity	4	<ul style="list-style-type: none"> Students will understand and learn about the taxonomy and the biology of non-chordates and chordates with their structural organization, adaptive features, and evolutionary relationships. Able to learn about the diversity of chordates and non-chordates groups and also can identify the animals in this regard. 	Environment & Sustainability	Traditional teaching with chalk and duster, PPTs, teaching aids, blended method, study materials, field trips and laboratory practicals.
	II	CC-II	Comparative Anatomy & Developmental Biology of Vertebrates	4	<ul style="list-style-type: none"> Students will learn about the anatomy of different organ systems in vertebrates and the process of how they evolved in the course of evolution. Gain a comprehensive knowledge of early and late embryonic development of life and the role of fundamental processes in controlling the development. 	Human worth	Interactive lectures with chalk and duster, PPTs, teaching aids, blended method, study materials, and laboratory practicals.

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	III	CC-III	Physiology and Biochemistry	4	<ul style="list-style-type: none"> Students will understand the details of the physiology of digestion, respiration, excretion, blood circulatory system, reproduction and various endocrine glands with their functions in the human body. Students will be able to explain biomolecules like carbohydrates, lipids, and proteins addressing their synthesis, structure, functions, and metabolism in the human body. 	Human worth	Interactive lectures with chalk and duster, PPTs, teaching aids, blended method, study materials, and laboratory practicals.
	III	Skill Enhancement Course-I	Apiculture	2	<ul style="list-style-type: none"> Learners will have an understanding of honey bees, biology and social organization of Bee colonies. Learning the process of Beekeeping, honey extraction methods, and management of bee enemies and diseases for farming. Able to learn the economic importance of Apiculture and the Modern Methods of implementing cross-pollination in horticultural gardens. 	Environment & Sustainability, Entrepreneurship	Interactive lectures with chalk and duster, PPTs, teaching aids, blended method, study materials and field trips.
	IV	CC-IV	Genetics and Evolutionary Biology	4	<ul style="list-style-type: none"> Understanding Mendelian Genetics and its Extension, Chromosomal Mapping and the role of genetic mechanisms in evolution. Acquire a comprehensive knowledge of the different processes of evolution and the mode of speciation. 	Human worth	Interactive lectures with chalk and duster, PPTs, teaching aids, blended method, study materials, field trips and

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							laboratory practicals.
	V	Skill Enhancement Course- III	Sericulture	2	<ul style="list-style-type: none"> Students will be able to gain comprehensive knowledge on Sericulture about the variety of silkworms, cultivation of mulberry plants, maintenance of the farm, silkworm rearing and silk reeling technology. Identifying various diseases and pests of the mulberry plant with the control measures necessary for self-employment in mulberry and silk production. 	Environment & Sustainability, Entrepreneurship	Interactive lectures with chalk and duster, PPTs, teaching aids, blended method, study materials and field trips.
	V	Discipline Specific Elective-I	Applied Zoology	4	<ul style="list-style-type: none"> Students gain several knowledge on hosts, parasites, and different types of host-parasite interactions. Understand the Epidemiology of several diseases, life history, and pathogenicity of various protozoa, and helminths. Acquire a comprehensive idea about the biology of various Insects that have economic and medical importance. 	Environment & Sustainability	Traditional teaching with chalk and duster, PPTs, teaching aids, blended method, study materials, field trips and laboratory practicals.
	VI	Discipline Specific Elective-2	Immunology	4	<ul style="list-style-type: none"> Students will have an understanding of basic concepts in immunology comprising the components of immune system, innate and adaptive immunity, lymphoid organs, antigens and antibodies in elaboration. Learning how the immune system defends against foreign antigens by 	Human worth, Drug design & delivery	Interactive lectures with chalk and duster, PPTs, teaching aids, blended method, study materials, and laboratory practicals.

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					<p>processing and presenting antigens to immune cells for destruction and also in a couple of ways.</p> <ul style="list-style-type: none"> • Gain knowledge of how the immune system plays a key role in various types of hypersensitivities, autoimmunity and immunodeficiency diseases. • Acquire a preliminary concept of how the different vaccines are developed. 		



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DEPARTMENT OF ZOOLOGY

COURSE OUTCOME

3-Year Degree in Zoology

Under Curriculum and Credit Framework
for Undergraduate Programmes (CCFUP)

AS PER NEP, 2020

With effect from 2023-2024

PROGRAM	SEMESTER	COURSE NAME	COURSE DETAIL	CREDIT	COURSE OUTCOME	CROSS CUTTING ISSUES	METHOD OF CURRICULUM DELIVERY
B.Sc. 3 Year Degree in Zoology (Major)	I	Major Course	Non-Chordates [ZOOL1011]	4	➤ At the end of the syllabus students learn the systematic and biology of non-chordates through their adaptive features and their body organization. Comprehend the identification of species and their evolutionary relationships.	Environment & Sustainability	Traditional teaching with chalk and duster, PPTs, teaching aids, blended method, study materials, field trips and laboratory practical.
		Skill Enhancement Course (SEC)	Apiculture [ZOOL1051]	3	➤ Get complete knowledge of honeybees and their different casts. ➤ Get knowledge about artificial beehive and their uses for apiculture. ➤ To know about different diseases on enemies of honeybees. ➤ Able to know the techniques of	Environment & Sustainability, Entrepreneurship	Interactive lectures with chalk and duster, PPTs, teaching aids, blended method, study materials and field trips.

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					<p>honey extraction and handling of honeybees.</p> <ul style="list-style-type: none"> ➤ Get a brief idea about entrepreneurship in Apiculture. ➤ Able to learn the economic importance of Apiculture and the Modern Methods of implementing cross-pollination in horticultural gardens. 		
	II	Major Course	Chordates [ZOOL2011]	4	<ul style="list-style-type: none"> ➤ The students will get knowledge to explain the diversity of Protochordates and chordates. ➤ Identify the taxonomic position of chordates, their diversity, and their distribution. ➤ Gain insights about economic importance and significance Pieces and Pisciculture. ➤ Identify and distinguish between poisonous and non-poisonous snakes by observing characteristic features. ➤ Students gain knowledge about the composition and significance of venom. ➤ Gain insights about the structural specialties of birds which will help them for Poultry (commercial application). ➤ Adaptive radiation of Mammals will give the insight into diversity and distribution of Mammals. 	Environment & Sustainability, Human worth	Interactive lectures with chalk and duster, PPTs, teaching aids, blended method, study materials, and laboratory practicals.

PROGRAM	SEMESTER	COURSE NAME	COURSE DETAIL	CREDIT	COURSE OUTCOME	CROSS CUTTING ISSUES	METHOD OF CURRICULUM DELIVERY
		Skill Enhancement Course (SEC)	Sericulture [ZOOL2051]	3	<ul style="list-style-type: none"> ➤ Get complete knowledge of silkworms and their different types. ➤ Get knowledge about technology of silkworm culture and making of silk. ➤ To know about different diseases on enemies of silkworms. ➤ Get a brief idea about entrepreneurship in Sericulture. 	Environment & Sustainability, Entrepreneurship	Interactive lectures with chalk and duster, PPTs, teaching aids, blended method, study materials and field trips.
	III	Major Course	Biochemistry [ZOOL3011]	5	<ul style="list-style-type: none"> ➤ This will help learners to understand the objectives of studying Biochemistry. ➤ The learner will get a clear concept of the structures and reactions of different biomolecules in the living system. Able to explain biomolecules like carbohydrates, lipids, and proteins addressing their synthesis, structure, functions, and metabolism in the human body. ➤ Learners will cope with the fast and far-reaching advancement of biological sciences in this century and be able to update themselves with the emerging concept of biochemistry. ➤ Students will develop a deep interest in this subject, which is very important for daily life and also for different competitive examinations. 	Human worth	Interactive lectures with chalk and duster, PPTs, teaching aids, blended method, study materials, and laboratory practicals.

PROGRAM	SEMESTER	COURSE NAME	COURSE DETAIL	CREDIT	COURSE OUTCOME	CROSS CUTTING ISSUES	METHOD OF CURRICULUM DELIVERY
			Cell Biology [ZOOL3012]	5	<ul style="list-style-type: none"> ➤ The students will learn about the different subcellular components-their structure, function and biochemical properties, organization at cellular level with respect to extracellular matrix, cytoskeleton, cell junction, cell signaling and cell division. ➤ They will also have an outline knowledge of cancer cells and apoptosis. 	Human and medical worth	Interactive lectures with chalk and duster, PPTs, teaching aids, blended method, study materials, and laboratory practicals.
		Skill Enhancement Course (SEC)	Animal Husbandry and Management [ZOOL3051]	3	<ul style="list-style-type: none"> ➤ Learners will understand the objectives of studying husbandry and its management techniques. ➤ Students will cope with the topic and update themselves with the emerging concept of this topic. ➤ Students will get knowledge about the technique of farming different economically important animals. ➤ Students will get encouragement about entrepreneurship in Husbandry. 	Environment & Sustainability, Entrepreneurship	Interactive lectures with chalk and duster, PPTs, teaching aids, blended method, study materials and field trips.
			OR				
			Medical Diagnostics [ZOOL3051]	3	<ul style="list-style-type: none"> ➤ Students will be able to learn basic understanding of the structure of the human body. ➤ Learn aspects related to medical diagnosis. ➤ Learn to perform tests which help in the diagnosis and treatment of diseases. ➤ Handle laboratory instruments. 	Human and medical worth, Entrepreneurship	Interactive lectures with chalk and duster, PPTs, teaching aids, blended method, study materials and field trips.

PROGRAM	SEMESTER	COURSE NAME	COURSE DETAIL	CREDIT	COURSE OUTCOME	CROSS CUTTING ISSUES	METHOD OF CURRICULUM DELIVERY
					<ul style="list-style-type: none"> ➤ Students are expected to be economically self-sufficient. 		
	IV	Major Course	Animal Physiology [ZOOL4011]	5	<ul style="list-style-type: none"> ➤ The student should be able to understand and develop the skills to identify different types of blood cells. ➤ Enhance basic laboratory skills like keen observation, analysis and discussion. ➤ Learn the functional attributes of different organ systems of the body. 	Human and medical worth	Interactive lectures with chalk and duster, PPTs, teaching aids, blended method, study materials, laboratory practical and field trips.
			Disease Biology [ZOOL4012]	5	<ul style="list-style-type: none"> ➤ Students will be able to demonstrate a knowledge of innate and adaptive immunity, including the process of inflammation. ➤ Demonstrate a knowledge of how microbial pathogens (viruses, bacteria, and parasites) evade host defences and cause disease. ➤ Demonstrate a knowledge of how deregulation of cellular growth and differentiation cause disease. ➤ Demonstrate a knowledge of the pathobiology of the circulation, including the process of thrombosis and infarction. ➤ Demonstrate a knowledge of interactions between infectious organisms and their hosts, with particular reference to emerging infections. ➤ Recognize and identify a number of common bacterial species that 	Human and medical worth	Interactive lectures with chalk and duster, PPTs, teaching aids, blended method, study materials, laboratory practical and field trips.

PROGRAM	SEMESTER	COURSE NAME	COURSE DETAIL	CREDIT	COURSE OUTCOME	CROSS CUTTING ISSUES	METHOD OF CURRICULUM DELIVERY
					may be associated with human and animal diseases.		
			Comparative Endocrinology [ZOOL4013]	5	<ul style="list-style-type: none"> ➤ Students understand how the endocrine system is functioning. ➤ They know the structures and molecular modes of action of a large variety of vertebrate and invertebrate hormones and understand how metazoan hormones and their functional mechanisms have evolved. Hormones as mediators of growth, development, phenotype, behavior, reproduction, and epigenetic effects are covered and connected to relevant current events. 	Human and medical worth	Interactive lectures with chalk and duster, PPTs, teaching aids, blended method, study materials, laboratory practical and field trips.