

Department of Zoology
Rabindra Alahabidyalaya
Champadanga Hooghly

Year: 2024-2025
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PROGRAMME SPECIFIC OUTCOME:

- Apply zoological knowledge in much more broader areas of life.

- ② Identify and analyze problems by applying the principles of natural science.
- ② Provide a comprehensive understanding of various animals from their primitive forms to their highly evolved forms.
- ② Inculcate knowledge and prepare for a successful career in the field of zoology. ② Aims to emphasize the need for biodiversity conservation.

Semester	Course	Paper Code	Paper Name	Objective	Course Outcome
I	Major	ZOOL1011	Non-Chordates	The main objective of this syllabus is to At the end of the syllabus students learn acquaint the students about the diversity of the Systematic and biology of non chordates animals (invertebrates) of this universe through their adaptive features and their especially their taxonomic position of animal body organization. Comprehend the kingdom as well as their physiology and organ identification of species and their system.	
I	Major	ZOOL1051	VERMICULTURE	Vermiculture is the study of technologies that utilize earthworms for degrading waste organic materials and agricultural re-use. Earthworms degrade organic waste materials and convert them into vermicompost. The main objective of this course is to provide the students with knowledge of	1. The Course Has A Broad scope for Commercial application of technologies that utilize earthworms for Employability. 2. Students will gather knowledge on soil earthworms; their characteristic features, occurrence, and influence on soil fertility and solid waste management are included. 3. Students will gather knowledge on Vermicomposting

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				vermitechnology and its application in agriculture as well as entrepreneurship.	technology in respect of the global level as well as the Indian perspective. 4. Application of Vermiculture products and their benefits in agriculture practice.
I	Major	ZOOL1051	Apiculture	<p>This Skill Enhancement Course aims to enlighten honeybees and their different casts. · Get students on the health status of patients with knowledge about artificial beehive and their simple diagnostic tests and evaluations. This uses for apiculture. · To know about course will help to make students self-sufficient different diseases on enemies of honeybees. in future. They are expected to be adept in laboratory techniques.</p>	<p>After completion of course, students will be able to:</p> <ul style="list-style-type: none"> · Get complete knowledge of · Able to know the techniques of honey extraction and handling of honeybees. · Get a brief idea about entrepreneurship in Apiculture.
I	Minor	ZOOL1021	Non-Chordates	<p>The main objective of this syllabus is to At the end of the course students will learn acquaint the students with the diversity of about the systematics and biology of non- animals (invertebrates) of this universe chordates through their adaptive features especially their taxonomic position of the animal and body organization and comprehend the</p>	

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				kingdom as well as their physiology and organ identification of species and their system.	
II	Major	ZOOL-2011	Chordates	<p>This course is designed to give a learner the fundamental understanding of the diversity of Phylum Chordata with emphasis on their origin, key characteristics, classification, distribution, and function. This course will make the students enlightened with the concept of diversity, organization, adaptation, and taxonomic status of Chordates. The course will give an understanding of the systemic physiology of chordates. There will be a discussion about the affinities of chordates to different groups.</p>	<p>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</p>

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II	Major	ZOOL2051	SERICULTURE	<p>The syllabus for Sericulture at undergraduate SEC according to NEP has been framed. The main objective of framing this new syllabus is to</p> <ol style="list-style-type: none"> 1. Get Complete Knowledge of Silkworms and give the students a proper understanding of their different types. 2. Get knowledge Sericulture. Students will get knowledge about about technology of silkworm culture and mulberry plant cultivation, different silkworms, making of silk. 3. To Know About Different culture techniques, silk production, and the Diseases On Enemies Of Silkworms. 4. Get a knowledge of diseases and enemies of Brief Idea about entrepreneurship in silkworms. The students can be utilized the Sericulture. <p>knowledge in starting their own enterprise after completion of the course.</p>	
II	Minor	ZOOL2021:	CHORDATES	<p>his course is designed to give a learner the fundamental understanding of the diversity of the Phylum Chordata with emphasis on their origin, key characteristics, classification, distribution of chordates, and functioning. This course will make the students enlightened with the concept of diversity, organization, and functioning.</p> <p>The students will get knowledge to explain the diversity of Protochordates and Chordates. Identify the taxonomic position and distribution. Gain insights about economic and social importance of chordates. Identify and distinguish between the taxonomic status of chordates. The course will enlighten the students about the diversity, organization, and functioning of chordates.</p>	

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				give the understanding of systemic physiology of observing characteristic features. Students chordates. There will be discussion about the gain knowledge about the composition and affinities of chordates to different groups.	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.
III	Major	ZOOL3031	Biochemistry	The objective of this study is to foster v This topic is designed to help learners to enthusiasm among students for Biochemistry, understand the objectives of studying highlighting its significance within the broader Biochemistry. v The learner will get a clear context of Zoology. Through this course, concept of the structures and reactions of learners will gain an understanding of the different biomolecules in the living system. v fundamental chemistry that drives biological Learners will cope with the fast and far-processes, enabling them to independently reaching advancement of biological sciences in address challenges in both biology and this century and be able to update chemistry. The curriculum covers the analysis themselves with the emerging concept of of molecular structure and function, as well as biochemistry. v Students will develop a deep the myriad chemical reactions occurring within interest in this subject, which is very	

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				<p>living cells. It aims to ignite a sense of importance for daily life and also for curiosity in students, encouraging them to different competitive examinations explore the intricate mechanisms of various biomolecules and their interconnections. This program also seeks to motivate students to pursue advanced studies in Biochemistry and related interdisciplinary fields, thereby equipping them with the skills necessary for both salaried and entrepreneurial ventures</p>	
III	Major	ZOOL3032	Cell Biology	<p>To give an idea of the different structures involved in cellular organization, both within and outside the cell; outline knowledge of division and signaling at cellular level and a detailed idea of the important subcellular components that are involved in the process of transportation of molecules to and from the cell, as well as synthesis of various proteins and ATP</p>	<p>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.</p>

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III		ZOOL3051	Medical Diagnostics	<p>This Skill Enhancement Course aims to enlighten students on the health status of patients with simple diagnostic tests and evaluations. This course will help to make students self-sufficient in future. They are expected to be adept in laboratory techniques.</p>	<p>After completion of course, students will be able to:</p> <ol style="list-style-type: none"> 1. Learn basic understanding of the structure of the human body. 2. Learn aspects related to medical diagnosis. 3. Learn to perform tests which help in the diagnosis and treatment of diseases. 4. Handle laboratory instruments. 5. Students are expected to be economically self-sufficient.
IV	Major	ZOOL4011	Animal Physiology	<p>To understand various functional components of an organism. To explore the complex network of these functional components. To comprehend the regulatory mechanisms for function of the body.</p>	<p>To understand various functional components of an organism. To explore the complex network of these functional components. To comprehend the regulatory mechanisms for function of the body.</p>

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IV	Major	ZOOL4012	Disease Biology	<p>The specific learning goals for disease biology are to explore the causes of diseases of the animal world and to provide students with a working knowledge of fundamental concepts and molecular mechanisms leading to diseases. This will help in further understanding of the immune responses facilitating recovery and protection, also examine the mechanism of action of disease therapies and investigate the physiological and ecological factors that influence the frequency of disease occurrence.</p>	<p>The specific learning goals for disease biology are to explore the causes of diseases of the animal world and to provide students with a working knowledge of fundamental concepts and molecular mechanisms leading to diseases. This will help in further understanding of the immune responses facilitating recovery and protection, also examine the mechanism of action of disease therapies and investigate the physiological and ecological factors that influence the frequency of disease occurrence.</p>
IV	Major	ZOOL4013	Comparative Endocrinology	<p>To introduce basic terms of Endocrinology. To v Students understand how the endocrine system is functioning. v They know the familiarize the learners with the structure, structures and molecular modes of action of types, and classification of chromosomes. To a large variety of vertebrate and in introduce the concept of sex determination and vertebrate hormones and understand how its types, sex-linked, sex-influenced, and sex- Limited Genes. To develop an understanding of mechanisms have evolved. v Hormones as</p>	<p>v Students understand how the endocrine system is functioning. v They know the familiarize the learners with the structure, structures and molecular modes of action of types, and classification of chromosomes. To a large variety of vertebrate and in introduce the concept of sex determination and vertebrate hormones and understand how its types, sex-linked, sex-influenced, and sex- Limited Genes. To develop an understanding of mechanisms have evolved. v Hormones as</p>

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				genetic variability within a population and learn mediators as to how the changes take place.	of growth, development, phenotype, behavior, reproduction, and epigenetic effects are covered and connected to relevant current events.
IV	Minor	ZOOL4051	Wildlife Conservation	To provide a knowhow of the (a) various aspects of wildlife, including their values, depletion, learn about the importance of wildlife and conflicts with human beings and principles of conservation in and around our surroundings conservation and various ecological attributes, as well as wild habitats and their relation to (b) Management and legal protection of different ecological principles, emerging different natural habitats and threatened cases of man - animal conflict and impact of species, and (c) different tools and techniques related to wildlife study. Objectives of the Course	At the end of the course, students should learn about the importance of wildlife and conflicts with human beings and principles of conservation in and around our surroundings conservation and various ecological attributes, as well as wild habitats and their relation to management and legal protection of different ecological principles, emerging different natural habitats and threatened cases of man - animal conflict and impact of species, and (c) different tools and techniques of ecotourism on wild animals, with a general related to wildlife study. Objectives of the knowledge on the different legal structures associated with wildlife fauna.
V	Major	ZOOL5011	Genetics	To develop conceptual clarity of Mendelian principles of inheritance and other forms of inheritance. patterns. To introduce the concept of sex determination and its types sex-linked, sex- influence and sex-limited genes. To develop an	Integrate the knowledge of principles of inheritance and other forms of inheritance. Imbibe the concept of chromosomes, multiple linkage, crossing over, sex determination.

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				understanding of genetic variability within a population and learn as to how the changes take place	Compare the structure and types of chromosomes, genetic disorder and cancer.
V	Major	ZOOL5012	Molecular Biology	To give an idea of the relationship between DNA, RNA and protein synthesis, to study the interaction of different factors regulating these processes and the different processes of DNA repair.	The students will be able to understand the molecular basis of various biological processes and the diverse mechanisms of gene regulation.
V	Major	ZOOL5013	Animal Biotechnology	To understand Biotechnology, which is a major tool in modern research, especially in biological sciences, medical sciences, forensic science, and environmental science. To know the various skills like keen observation, analysis, and techniques for research work. It is truly regarded as the scientific technology of the twenty-first century	At the end of the course, the students will be able to develop the skill of modern techniques of biological tools at the molecular level of research; enhance basic laboratory discussion; learn the functional attributes (molecular level) of different cell type and disorder of the various cell and help in diagnosis of the different disorders.

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VI	Major	ZOOL6011	Evolutionary Biology and Ethology	<p>1. Evolutionary Biology is a foundational science that explores the origin of life, various theories of evolution, animal evolution, and evolutionary genetics. Understanding evolutionary biology provides insights into how organisms have evolved over time and the processes that drive these changes.</p> <p>2. Ethology is an important branch of Zoology today. Understanding animal behaviour is crucial for students, as it aids in the conservation process and promotes better coexistence with other species.</p>	<p>1. Students will get knowledge of the history of life on earth and the causal processes of evolution.</p> <p>2. Students will gather knowledge about the causes of the extinction of species and the application of genetics in evolution.</p> <p>3. Students will be able to learn some essential genetics. Understanding evolutionary biology aspects of Evolutionary Biology and acquire provides insights into how organisms have an understanding of the subject.</p> <p>4. Knowledge evolved over time and the processes that drive of animal behaviours increases the students' these changes.</p> <p>5. Knowledge of wildlife will help in their branch of Zoology today. Understanding animal behaviour is crucial for students, as it aids in the conservation process and promotes better coexistence with other species.</p> <p>6. Study of animal behaviour can help to develop new approaches and ideas for the conservation and management of wildlife.</p>

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VI	Major	ZOOL6012	Ecology and Conservation Biology	<p>Understanding ecology and biodiversity provides related to population, community and a thorough knowledge of the interactions ecosystem levels of organisation. Students between organisms and their environment, will gather knowledge on different aspects of including various ecosystem components and biodiversity, including its levels, species functions that are important for maintaining diversity measures and indices, megadiverse biodiversity, as well as the role of species, countries and biodiversity hot spots. populations and communities in ecological Knowledge of wildlife and conservation biology processes. In this era of rapid biodiversity will help to increase awareness among loss, conservation biology focuses on protecting students regarding the importance of wildlife wildlife and other components of biodiversity. and different biodiversity components in This is achieved through various management maintaining a healthy relation between man strategies, efforts, and policies implemented at and environment. The students will be able local, national, and global levels.</p>	<p>Students will get knowledge of the fundamentals of ecological organisation, limiting factors and different attributes</p> <p>to learn about different management techniques to protect the threatened wild animals and ecosystems, like the tigers, hoolock gibbon, red panda, snow leopard,</p>

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VI	Major	ZOOL6013	Developmental Biology	<p>Study of Developmental Biology aims to provide an understanding of the development of a single cell into an organised grouping of cells, which is programmed at specific times to become specialised</p>	pygmy hog, golden langur, etc. in India.
					<p>Upon successful completion, students will have the knowledge and skills to:</p> <ol style="list-style-type: none"> 1. Explain the molecular and genetic background of animal development 2. Describe the evolutionary history of complex multicellular life forms 3. Compare environmental influences in the development and homeostasis of cells

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VI	Major	ZOOL6014	Histology and Histochemistry	<p>Students will learn Bioanalytical Techniques, The study of mammalian tissues at the including mammalian tissue structure, histological level involves understanding their histopathological changes in diseases, and structural organisation and disease-induced permanent slide preparation. They will explore morphological alterations. It explores the immunofluorescence, protein identification, and relationship between aetiology, pathogenesis, cell morphology alterations. The course covers and histopathological changes. Key techniques immunohistochemistry, cryotechniques, enzyme include permanent slide preparation, histochemistry, and histochemical methods for immunofluorescence, immunohistochemistry, detecting carcinomas using immunofluorescent and enzyme histochemistry, which aid in techniques.</p>	