UNIVERSITY OF NORTH BENGAL

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B.Sc. Zoology 4 YEAR UNDERGRADUATE PROGRAM
(FYUGP)
w.e.f. 2024-2025

Course Objectives & Outcomes for
B.Sc. Zoology (Major & Minor) Under
THE NEW CURRICULUM AND CREDIT FRAMEWORK, 2022

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B.Sc. Zoology

UNIVERSITY OF NORTH BENGAL
RAJA RAMMOHANPUR, DARJEELING
WEST BENGAL
PIN-734013

Semester I

MAJOR 1: Biology of Non-Chordates (Paper Code: ZOOMAJ101)

Paper Type: Theory + Practical Lab Based [TH+PLB]

Credit: 4 (Theory 3+ Practical 1)

Course Objectives:

The course Biology of Non-Chordates is designed to explore the diversity of non-chordates in the world and to understand the underlying principles of classification of non-chordates. Students will learn to classify invertebrates and to be able to understand the morphological, adaptive and anatomical features of diverse non-chordate groups, their economic and ecological significance and their relationships. The course will create general interest among students in the diversity of invertebrates.

Course Outcome:

By studying this course, students will be able to;

- Understand, classify and identify the diversity of non-chordates.
- Acquire knowledge of systematic position, habitat and structural organization of non-chordates.
- Critically analyse the organization, complexity and characteristic features of non-chordates.
- Understand the economic importance of non-chordates, their interaction with the environment, role in the ecosystem, evolutionary history and their relationships.
- Appreciate the diversity of non-chordates living in varied habitats.
- Enhance collaborative learning and communication skills through practical sessions, group discussions, assignments and projects.

MAJOR 2: Ecology (Paper Code: ZOOMAJ102)

Paper Type: Theory + Practical Lab Based [TH+PLB]

Credit: 4 (Theory 3+ Practical 1)

Course Objectives:

Ecology is the study of organisms, the environment, and the interactions between the organisms and their surroundings. Numerous levels, including the organism, population, community, biosphere, and ecosystem, are researched. Understanding the distribution of biotic and abiotic elements, as well as how they interact and relate to one another and the environment, is the major goal of ecology. It also looks at how living things may use the environment and its resources effectively today so that future generations can benefit from them as well. The preservation of clean air and water, the production of food, and the maintenance of biodiversity in a changing climate all depend on it. It is crucial for resource allocation, environmental conservation, and pollution reduction.

Course outcome:

This course offers students

- The knowledge to conserve and protect nature and prevent the extinction of species,
- An idea of how all species fit together, what their habitat requirements are, how they influence each other, and what population size ensures their survival, etc.
- The awareness of environmental problems
- Imparting basic knowledge about the environment and its allied problems.
- Developing an attitude of concern for the environment.

MINOR 1: Non-Chordates (Paper Code: ZOOMIN101)

Paper Type: Theory + Practical Lab Based [TH+PLB]

Credit: 4 (Theory 3+ Practical 1)

Course Objectives:

This minor course will help to learn the distinctiveness of the different animal phyla/classes. Allow the students to learn the diagnostic characters of different phyla/classes through brief studies of examples. Finally, it will help to understand the evolutionary tree.

Course outcome:

Students are expected to;

- Gain basic knowledge of animal diversity.
- Gain knowledge of animal classification.
- Know the general characteristics and lifecycle patterns of representative animals of some of the non-chordate and chordate animals.
- Acquire special adaptive features of some phyla/classes.

Semester II

MAJOR 3: Biology of Chordates (Paper Code: ZOOMAJ203)

Paper Type: Theory + Practical Lab Based [TH+PLB]

Credit: 4 (Theory 3+ Practical 1)

Course Objectives:

The course Biology of Chordates is designed to explore the diversity of chordates around the world and to understand the underlying principles of the classification of chordates. The course will help to learn how to classify vertebrates and to be able to understand the morphological, adaptive and anatomical features of diverse chordate groups, their economic, ecological and evolutionary significance and their relationships. The course will create general interest among students about the life of animals in order to explore and appreciate the diversity of chordates in nature.

Course Outcome:

By studying this course, students will be able to;

- Understand, classify, and identify the diversity of chordates.
- Acquire knowledge of systematic position, habitat and structural organization of chordates.
- Critically analyses the organization, complexity and characteristic features of chordates.
- Understand the economic importance of chordates, their interaction with the environment, role in the ecosystem, evolutionary history and their relationships.
- Appreciate the diversity of chordates living in varied habitats.
- Enhance collaborative learning and communication skills through practical sessions, group discussions, assignments and projects.

MAJOR 4: Applied Zoology [Sericulture, Apiculture and Fisheries]

(Paper Code: ZOOMAJ204)

Paper Type: Theory + Practical Lab Based [TH+PLB]

Credit: 3 (Theory 2+ Practical 1)

Course Objectives:

Sericulture, Apiculture and & Fisheries deal with the application of zoological knowledge for the benefit of mankind. These are the specialised branches of zoology that deal with the animal world that is associated with the economy, health and welfare of humans. It includes culturing animals for mass production for human use and to control or eradicate animals that are injurious to humans directly or indirectly.

Course Outcome:

This course offers students;

- An understanding of experiential learning on the methodology of sericulture, Apiculture and Fisheries.
- It will also provide information about the economic aspects of culturing animals.
- It would promote Community and Youth Development.
- About the idea of detailed information regarding aquaculture management with interdisciplinary approaches, because the conservation of aquatic resources is essential in the present scenario.

MINOR 2: Chordates (Paper Code: ZOOMIN202)

Paper Type: Theory + Practical Lab Based [TH+PLB]

Credit: 4 (Theory 3+ Practical 1)

Course Objectives:

This minor course will help to learn the distinctiveness of the different animal phyla/classes. Allow the students to learn the diagnostic characters of different phyla/classes through brief studies of examples. Finally, it will help to understand the evolutionary tree.

Course outcome:

Students are expected to;

- Gain basic knowledge of animal diversity.
- Gain knowledge of animal classification.
- Know the general characteristics and lifecycle patterns of representative animals of some of the non-chordate and chordate animals.
- Acquire special adaptive features of some phyla/classes.

Semester III

MAJOR 5: Cell Biology (Paper Code: ZOOMAJ305)

Paper Type: Theory + Practical Lab Based [TH+PLB]

Credit: 4 (Theory 3+ Practical 1)

Course Objectives:

This course will help students learn the basic concepts and processes in cell biology. It will enable the student to understand the structure and function of cell organelles, how they communicate with each other and how division and regulation take place in cells. The course will help to understand how cells get external signals and respond to them. The practical content of this course is designed to understand the basics of microscopy, to measure the cells, and to observe the stages of cell division.

Course outcome:

Students are expected to;

- Understand the cell and its biology, which will help them to get an insight into the cellular structure, various components of cells and functions.
- Understand the chemical composition, physicochemical and functional organization of the organelle.
- Acquire knowledge how cells divide by means of meiosis and mitosis, and will be able to correlate different factors that control cell cycle progression.
- Understand how a cell gets an external signal and responds to it.

MAJOR 6: Biochemistry-Fundamentals (Paper Code: ZOOMAJ306)

Paper Type: Theory + Practical Lab Based [TH+PLB]

Credit: 4 (Theory 3+ Practical 1)

Course Objectives:

1. To create interest in Biochemistry and appreciation for the chemical basis of biological processes.
2. To provide an in-depth understanding of chemical reaction mechanisms in biological processes.
3. Gain proficiency in basic laboratory techniques and be able to apply the scientific method to the processes of experimentation, hypothesis testing, data interpretation and logical conclusions.

Course outcome:

The course provides an introduction to cell biology, the role of water in biological systems, Biomolecules and Metabolic concepts. After successful completion of the course, the students will be able to understand: 1. Cell theory, Basic cell structure, functions of various cell organelles in eukaryotic cells, Plasma membrane structure and function. 2. Role of water in biochemical reactions occurring within living systems, pH maintenance in living organisms and physiological buffers. 3. Biological significance of carbohydrates, amino acids, proteins, lipids and nucleic acids present in the cell. 4. Concept of anabolism, catabolism, amphibolism, energy relationship between synthetic and degradative pathways, characteristics of metabolic pathways.

MINOR 3: Cell Biology (Paper Code: ZOOMIN303)

Paper Type: Theory + Practical Lab Based [TH+PLB]

Credit: 4 (Theory 3+ Practical 1)

Course Objectives:

This minor course will help students learn the basic concepts and processes in cytobiology. It will enable the student to understand the structure and function of cell organelles, how they communicate with each other and how division and regulation take place in cells. The course will help to understand how cells get external signals and respond to them. The practical content of this course is designed to help understand the stages of cell division.

Course outcome:

Students are expected to;

- Understand the cell and its biology, which will help them to get an insight into the cellular structure, various components of cells and functions.
- Understand the chemical composition, physicochemical and functional organization of the organelle.
- Acquire knowledge about how cells divide by means of meiosis and mitosis, and will be able to correlate different factors that control cell cycle progression.

Semester IV

MAJOR 7: Genetics (Paper Code: ZOOMAJ407)

Paper Type: Theory + Practical Lab Based [TH+PLB]

Credit: 4 (Theory 3+ Practical 1)

Course Objectives:

Genetics is the study of heredity at multiple levels of understanding, ranging from molecules to population. Genetics occupies the central position in modern biology, so its understanding is essential for all scholars of life sciences. The discipline has a great impact on everyday aspects of human life. Genetics provides a comprehensive, detailed understanding of the chemical basis of heredity & role of genetic mechanisms in evolution.

Course outcome:

- This course will help students to understand basic and some advanced aspects of genetics required for most research.
- Students will gain knowledge of chromosome structure and function, and hands-on training on chromosome preparation. It will also help students to gain knowledge of the applications of some core topics in gene analysis.
- Students will understand the basic idea of some chromosomal anomalies leading to disease.
- It will empower students to get employed in academic and research institutions.

MAJOR 8: Ethology and Chronobiology (Paper Code: ZOOMAJ408)

Paper Type: Theory + Practical Lab Based [TH+PLB]

Credit: 4 (Theory 3+ Practical 1)

Course Objectives

The field of animal behaviour research has grown significantly over the past many years and contributes significantly to our understanding of the fundamental biological system. An overview of the intricacies of animal behaviour and its scientific study is given in this course. Students will investigate the range of actions that animals exhibit to cope with the stresses of everyday existence. It also sheds light on how animals interact, learn, and locate food. It also explains how they choose partners and raise their young. This course is intended for anyone who wants to learn more about the behaviour of animals. All that is needed is curiosity and a passion for the subject; prior knowledge is not required.

Course Outcome

This course offers students

- Key concepts of animal behaviour
- The fascinating range and complexity of behaviour in animals
- How scientific hypotheses are developed and tested
- How animals learn and communicate
- Animals' reproductive behaviour
- How animals function socially

MINOR 4: Genetics (Paper Code: ZOOMIN404)

Paper Type: Theory + Practical Lab Based [TH+PLB]

Credit: 4 (Theory 3+ Practical 1)

Course Objectives:

Genetics is the study of heredity at multiple levels of understanding, ranging from molecules to population. Genetics occupies the central position in modern biology, so its understanding is essential for all scholars of life sciences. The discipline has a great impact on everyday aspects of human life. Genetics provides a comprehensive, detailed understanding of the chemical basis of heredity & role of genetic mechanisms in evolution.

Course outcome:

- This course will help students to understand basic and some advanced aspects of genetics required for most research.
- Students will gain knowledge of chromosome structure and function, and hands-on training on chromosome preparation. It will also help students to gain knowledge of the applications of some core topics in gene analysis.
- It will empower students to get employed in academic and research institutions.