Ananda Chandra College, Jalpaiguri

B.Sc. Zoology (Major & Minor)

Under FYUGP

Semester 1

Paper	
MAJOR 1: Biology of Non-Chordates (Paper Code: UZOOMAJ1101)	**Course Objectives:** The course Biology of Non-Chordates designed to know 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 about the life of animals without backbone in order to explore and appreciate the diversity of non-chordates in nature and to understand our role as caretaker of life. **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 nonchordates. 1. Critically analyse the organization, complexity and characteristic features of nonchordates. 2. Understand the economic importance of non-chordates, their interaction with the environment, role in the ecosystem, evolutionary history and their relationships. 3.Appreciate the diversity of non-chordates living in varied habitats. 4. Enhance collaborative learning and communication skills through practical sessions, group discussions, assignments and projects
SEC 1: Sericulture and Apiculture (Paper Code: UZOOSEC11001)	**Course Objectives:** Sericulture and Apiculture deals with the application of zoological knowledge for the benefit

	of mankind. It is a specialized branch of zoology which deals with 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 man directly or indirectly. **Course Outcome:** This course offers students; 1. An understanding of experiential learning on the methodology of sericulture and Apiculture. 2.It will also provide information about economic aspects of culturing animals. 3. It would promote Community and Youth Development
MINOR 1: Animal Diversity (Paper Code: UZOOMIN10001) **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/class through brief studies of examples. Finally, it will help to understand the evolutionary tree. **Course outcome:** Students are expected to; 1. Gain the basic knowledge on the animal diversity. 2. Gain the knowledge on animal classification. 3. Know the general characteristics, lifecycle pattern of representative animals of some of the non-chordate and chordate animals. 4. Acquire special adaptive feature of some phyla/classes.
Semester II	
MAJOR 2: Biology of Chordates (Paper Code: UZOOMAJ12002) **Paper Type: Theory + Practical Lab Based [TH+PLB]** **Credit: 4 (Theory 3+ Practical 1)**	**Course Objectives:** The course Biology of Chordates designed to know the diversity of chordates around world and to understand the underlying principles of 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 and to understand our role as caretaker of life. **Course Outcome:** By studying this course, students will be able to; 1 Understand classify and identify the diversity of chordates. 2. Acquire knowledge of systematic position, habitat and structural organization of chordates. 3. Critically analyse the organization, complexity and characteristic features of chordates. 4. Understand the economic importance of chordates, their interaction with the environment, role in the ecosystem, evolutionary history and their relationships. 5.Appreciate the diversity of chordates living in varied habitats. 6.Enhance collaborative learning and communication skills through practical sessions, group discussions, assignments and projects.
SEC 2: Aquaculture & Fisheries and Poultry Farming (Paper Code: UZOOSEC12002) **Paper Type: Theory + Practical Lab Based [TH+PLB]** **Credit: 3 (Theory 2+ Practical 1)**	**Course Objectives:** Aquaculture & Fisheries and Poultry Farming deals with the application of zoological knowledge for the benefit of mankind. It is a specialized branch of zoology which deals with 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 man directly or indirectly. **Course Outcome:** This course offers students; 1. An understanding of experiential learning on the methodology of aquaculture, fisheries and poultry farming. 2. About the idea on detailed information regarding aquaculture management with interdisciplinary approaches because the conservation of aquatic resources is essential in the present scenario.

	3. It will also provide information about economic aspects of culturing animals. 4. It would promote Community and Youth Development**.**
MDC: Conservation Biology (Paper Code: UPOBMDC12026) **Paper Type: Theory [TH]** **Credit: 3 (Theory)**	**Course Objectives:** The objective of the curriculum is to ensure students get acquainted with the diverse elementary concepts associated with the conservation of living resources on earth alongside they get an exposure to the relevance, necessity and significance of Conservation Biology in the perspectives of the today's world. All these aspects are addressed within the scope of the standard of the course prescribed. **Course outcome:** Students are expected to; 1.Be conversant with the of biological resources on earth. 2. Be aware of the importance of the living resources the human civilization dwelling with. 3. Be encouraged to get associated with the conservation activities at various levels. 4. Be positive to take up courses on Conservation Biology at higher levels. 5. Be capable of thinking on or innovating methodologies of conservation, efficiently volunteer in various conservation projects.
Semester III	
MAJOR 3: Genetics (Paper Code: UZOOMAJ23003) **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 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 l;method to** **the processes of experimentation, hypothesis testing, data interpretation and logical conclusions.** **Course outcome:** **The course provides an introduction to cell biology, role of water in biological systems, Biomolecules and**

	Metabolic concepts. After successful completion of course, the students will be able to understand: 1. Cell theory, Basic cell structure, functions of various cell organelles in eukaryotic cell, 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
MAJOR 4: Biochemistry-Fundamentals(Paper Code: UZOOMAJ23004) **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 chemical basis ofbiologicalprocesses. 2. To provide an in-depth understanding of chemical reaction mechanisms inbiological processes. 3. Gain proficiency in basic laboratory techniques and be able to apply the scientificmethod to the processes of experimentation, hypothesis testing, data interpretation and logical conclusions. Course outcome: The course provides an introduction to cell biology, role of water in biological systems, Biomolecules and Metabolic concepts. After successful completion of course, the students will be able to understand: 1. Cell theory, Basic cell structure, functions of various cell organelles in eukaryotic cell, 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
MAJOR 5: Ecology (Paper Code: UZOOMAJ23005) **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 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 1.The knowledge to conserve and protect nature and prevent the extinction of species, 2.An idea how all species fit together, what are their habitat requirements, how they influence each other, and what population size ensures their survival, etc. 3.The awareness about environmental problems 4.Imparting basic knowledge about the environment and its allied problems. 5.Developing an attitude of concern for the environment.
SEC 3: Pest Management and Medical Diagnostics (Paper Code: UZOOSEC23003) **Paper Type: Theory + Practical Lab Based [TH+PLB]** **Credit: 4 (Theory 3+ Practical 1)**	**Course Objectives:** The overall objective of this course is to provide student with applied knowledge of zoology. The course will develop a basic understanding of pest management system and medical diagnostic by introducing theoretical and practical knowledge of commonly used tools and techniques in these fields. Course will provide impetus among students to look for becoming zoology based entrepreneur as their career choice instead of traditional job search. Course outcome:

	This course offers students 1.Acquire knowledge in various pest types and their management**.** 2. Acquaint knowledge about the different tools and techniques used in these fields. 3. Gain knowledge about medical diagnosis and various aspects of it. 4. Students can start their own business i.e. self-employments. 5. Get employment in different applied sectors.
MINOR 2: Cell Biology and Genetics (Paper Code: UZOOMIN10001) **Paper Type: Theory + Practical Lab Based [TH+PLB]** **Credit: 4 (Theory 3+ Practical 1)**	**Course Objectives:** This minor course will help to learn the students to the basic concepts and processes in cytobiology and genetics. It will capable the student to understand the structure and function of cell organelles, how they communicate with each other and how division and regulation takes place in cells. The course will help to understand how cell get external signals and respond to it. The practical content of this course is designed to understand the stages of cell division. Course outcome: Students are expected to; 1.Understand the cell and its biology which will help them to get an insight into the cellular structure, various components of cells and functions. 2.Understand the chemical composition, physicochemical and functional organization of organelle. 3.Acquire knowledge about how cells divide by means of meiosis and mitosis and will be able to correlate different factors which control cell cycle progression. 4.To understand how cell, get external signal and respond to it.
Semester IV	
MAJOR 6: Cell Biology (Paper Code: UZOOMAJ24006) **Paper Type: Theory + Practical Lab Based [TH+PLB]** **Credit: 4 (Theory 3+ Practical 1)**	**Course Objectives:** This course will help to learn the students to the basic concepts and processes in cell biology. It will capable the student to understand the structure and function of cell organelles, how they communicate with each other and how division and regulation takes place in cells. The course will help to understand how cell get external signals and respond to it. The practical

	content of this course is designed to understand the basics of microscopy, to measure the cells, to observe the stages of cell division. **Course outcome:** **Students are expected to;** 1. Understand the cell and its biology which will help them to get an insight into the cellular structure, various components of cells and functions. 2. Understand the chemical composition, physicochemical and functional organization of 3. organelle. 4. Acquire knowledge about how cells divide by means of meiosis and mitosis and will be able to correlate different factors which control cell cycle progression. **5.** To understand how cell, get external signal and respond to it.
MAJOR7: Physiology (Paper Code: UZOOMAJ24007) **Paper Type: Theory + Practical Lab Based [TH+PLB]** **Credit: 4 (Theory 3+ Practical 1)**	**Course Objectives:** The objective of this course is to provide a foundation for understanding the complexities of the coordination system of animal body.This course would make students to know about the functioning of various organs and systems, and their interrelationship for well-coordinated function. **Course outcome:** On successful completion of course, the students are expected to: 1. Gain fundamental knowledge of physiology of life processes. 2. Get acquainted with the anatomical details of different system. 3. Seek to understand the mechanisms that work to keep the animal body alive and functioning. 4. Gain detailed concepts of digestive system, respiratory system, excretory system, the functioning of nerves and muscles, cardiovascular system
MAJOR 8: Wildlife and Biodiversity (Paper Code: UZOOMAJ24008) **Paper Type: Theory + Practical Lab Based [TH+PLB]** **Credit: 4 (Theory 3+ Practical 1**)	**Course Objectives:** The course will introduce the concept of wildlife and biodiversity. It will give an exposure to the values and importance of wildlife and biodiversity. Course will present a view on the

e	biodiversity and wildlife resources in India and on earth. It will provide elementary ideas on measurement, estimation, and monitoring of wildlife and biodiversity. The course will present various threats to and the causes of loss of biodiversity and wildlife. It will highlight the significance and techniques of wildlife and biodiversity conservation along with relevant legal framework. **Course outcome:** On successful completion of course, the student will: 1. Have a clear concept on the concepts on wildlife and biodiversity with its various levels as well. 2. Be aware of the wildlife and biodiversity available and their values and importance. 3. Be acquainted with various measuring and monitoring techniques in practice for wildlife and biodiversity. 4. Be conscious about the threats to the natural resources. 5. Have an exposure to various conservation technique and strategies the basic legal foundation for the purpose.
MINOR 2: Cell Biology and Genetics (Paper Code: UZOOMIN20002) **Paper Type: Theory + Practical Lab Based [TH+PLB]** **Credit: 4 (Theory 3+ Practical 1)**	**Course Objectives:** This minor course will help to learn the students to the basic concepts and processes in cytobiology and genetics. It will capable the student to understand the structure and function of cell organelles, how they communicate with each other and how division and regulation takes place in cells. The course will help to understand how cell get external signals and respond to it. The practical content of this course is designed to understand the stages of cell division. **Course outcome:** **Students are expected to;** 1. Understand the cell and its biology which will help them to get an insight into the cellular structure, various components of cells and functions.

	2. Understand the chemical composition, physicochemical and functional organization oforganelle. 3. Acquire knowledge about how cells divide by means of meiosis and mitosis and will be able to correlate different factors which control cell cycle progression. 4. To understand how cell, get external signal and respond to it.