

# **KONGUNADU ARTS AND SCIENCE COLLEGE**

**(AUTONOMOUS)**

Re-accredited by NAAC with 'A+' Grade (4<sup>th</sup> Cycle)

College of Excellence (UGC)

29<sup>th</sup> Rank among colleges in NIRF 2023

Affiliated to Bharathiar University

Coimbatore – 641 029.

**DEPARTMENT OF ZOOLOGY (Aided)**

**COURSE OUTCOMES (CO) OF B.Sc., ZOOLOGY**

**For the students admitted**

**In the Academic Year 2023-2024**

<b>Programme Code:06</b>	<b>B.Sc., Zoology</b>		
Core Paper 1 – Invertebrata			
Batch 2023-2024	Hour/Week 5	Total Hours 75	Credits 4

**Course Objectives**

1. To obtain the knowledge of taxonomy and general characteristics of invertebrates.
2. To understand the morphological and anatomical features of selected invertebrates.
3. To create awareness about the harmful parasites and the economic importance of invertebrates.

**Course Outcomes (CO)**

<b>K1 to K5</b>	CO1	Identify the systematic position of various organisms in the phylum invertebrates.
	CO2	Understand the structure and its functions of the invertebrates.
	CO3	Apply the knowledge to study the important parasites and their control measures.
	CO4	Analyze the economic importance of invertebrate organisms.
	CO5	Evaluate the impact of beneficial and harmful invertebrate animals on human health and other animal health.

**Sub.Code:23UZO111**

<b>Programme Code :06</b>	<b>B. Sc., Zoology</b>		
Allied A Paper -I Sericulture - I			
Batch 2023-2024	Hour/Week 5	Total Hours 75	Credits 4

**Course Objectives**

1. To create a self-employment opportunity among students
2. To equip the skills of rearing of silkworms
3. To create better breeding and Grainage techniques of silkworms

**Course Outcomes**

<b>K1 to K5</b>	CO1	Get the knowledge about the mulberry and non-mulberry silkworms.
	CO2	Understand the various silkworm rearing techniques
	CO3	Apply knowledge on control measures of silkworm diseases
	CO4	Analyze silkworm breeding and various breeding techniques of silkworm
	CO5	Evaluate the various techniques of grainage operations of silkworms

**Sub. Code: 23EVS101**

<b>For B.A., BBA, B.Com, BCA and B.Sc., Degree Students</b>			
PART IV – ENVIRONMENTAL STUDIES			
Batch	Hours / Week	Total Hours	Credits
2023-2024	2	30	2

### **COURSE OBJECTIVES**

- The course will provide students with an understanding and appreciation of the complex interactions of man, health and the environment. It will expose students to the multi-disciplinary nature of environmental health sciences
- To inculcate knowledge and create awareness about ecological and environmental concepts, issues and solutions to environmental problems.
- To shape students into good “Ecocitizens” thereby catering to global environmental needs.
- This course is designed to study about the types of pollutants including gases, chemicals petroleum, noise, light, global warming and radiation as well as pollutant flow and recycling and principles of environmental pollution such as air, water and soil
- The course will address environmental stress and pollution, their sources in natural and workplace environments, their modes of transport and transformation, their ecological and public health effects, and existing methods for environmental disease prevention and remediation.

### **COURSE OUTCOMES**

On successful completion of the course, the students will be able to

K1 to K5	CO1	Understand how interactions between organisms and their environments drive the dynamics of individuals, populations, communities and ecosystems
	CO2	Develop an in depth knowledge on the interdisciplinary relationship of cultural, ethical and social aspects of global environmental issues
	CO3	Acquiring values and attitudes towards complex environmental socio-economic challenges and providing participatory role in solving current environmental problems and preventing the future ones
	CO4	To gain inherent knowledge on basic concepts of biodiversity in an ecological context and about the current threats of biodiversity
	CO5	To appraise the major concepts and terminology in the field of environmental pollutants, its interconnections and direct damage to the wildlife, in addition to human communities and ecosystems

**Sub.Code:23UZO202**

<b>Programme Code:06</b>	<b>B.Sc., Zoology</b>		
Core Paper- 2- Chordata			
Batch 2023-2024	Hour/Week 5	Total Hours 75	Credits 5

**Course Objectives**

1. To obtain the comprehensive knowledge on the taxonomy and characteristics of chordates.
2. To understand the morphological and anatomical features of chordates.
3. To acquire knowledge on the general features, distribution and economic importance of chordates.

**Course Outcomes (CO)**

<b>K1 to K5</b>	CO1	Identify the systematic position of the various group of animals in Phylum Chordata.
	CO2	Understand the morphology and anatomy of animals in different class of Chordates.
	CO3	Apply the knowledge on the learned systematic position of various animals to study the evolutionary significance of animals.
	CO4	Analyze the different morphological and anatomical features development gradually from one class to another class on the adaptation of animals to various habitats.
	CO5	Evaluate the impact of evolved characteristics for the adaptation of different classes of animals to their habit and habitat.

<b>Programme code :06</b>	<b>B.Sc., Zoology</b>		
Allied A Paper 2. Sericulture-II			
Batch 2023-2024	Hour/Week 5	Total Hours 75	Credits 4

**Course Objective**

1. To study the mulberry cultivation and rearing of silkworm
2. To develop skills about the quality and processing of silk
3. To know the importance of reeling and byproducts of reeling for industrial development

**Course Outcomes (CO)**

<b>K1 to K5</b>	CO1	Get the knowledge about the Sericulture.
	CO2	Understand the cultivation of mulberry plants, pests, diseases and control measures of mulberry plants.
	CO3	Apply knowledge on processing of cocoons and different methods of silk reeling
	CO4	Analyze the importance of sericulture in entrepreneurship development.
	CO5	Evaluate the importance of marketing of cocoons and raw silk Examinations.

<b>Programme Code:06</b>	<b>B.Sc., Zoology</b>		
Core Practical-1 Invertebrata and Chordata			
Batch 2023-2024	Hour/Week 4	Total Hours 120	Credits 2

**Course Objectives**

1. To observe various non-chordate specimens by using Microscope.
2. To know the various systems (Digestive system, circulatory system and Reproductive system) of frog or rat by using virtual laboratory.
3. To analyze the quality of excretory product of certain vertebrates.

**Course Outcomes (CO)**

<b>K3to K5</b>	CO1	Get the knowledge on the cellular organization of animal kingdom
	CO2	Understand the knowledge to study various anatomical system by using virtual laboratory
	CO3	Apply the knowledge on phylogenetic classification of animal kingdom
	CO4	Analyze the excretory products of certain vertebrates
	CO5	Evaluate the biological significance, structure, and functions of various animals.

<b>Programme Code: 06</b>	<b>For B.A., BBA, B.Com, BCA and B.Sc., Degree Students</b>		
<b>MORAL AND ETHICS</b>			
<b>Batch</b> 2023-2024	<b>Hours / Week</b> 2	<b>Total Hours</b> 30	<b>Credits</b> 2

### **Course Objectives**

- To impart Value Education in every walk of life.
- To help the students to reach excellence and reap success.
- To impart the right attitude by practicing self introspection.
- To portray the life and messages of Great Leaders.
- To insist the need for universal brotherhood, patience and tolerance.
- To help the students to keep them fit.
- To educate the importance of Yoga and Meditation.

### **Course Outcomes (CO)**

After completing the course the students:

<b>K1 to K5</b>	<b>CO1</b>	will be able to recognize Moral values, Ethics, contribution of leaders, Yoga and its practice
	<b>CO2</b>	will be able to differentiate and relate the day to day applications of Yoga and Ethics in real life situations
	<b>CO3</b>	can emulate the principled life of great warriors and take it forward as a message to self and the society
	<b>CO4</b>	will be able to Analyse the Practical outcome of practicing Moral values in real life situation
	<b>CO5</b>	could Evaluate and Rank the outcome of the pragmatic approach to further develop the skills



**Sub.Code: 23UZO303**

<b>Programme Code: 06</b>	<b>B.Sc., Zoology</b>		
Core Paper 3 – Cell and Molecular biology			
Batch 2023-2024	Hours / Week 5	Total Hours 75	Credits 5

**Course Objectives**

1. To provide the fundamental knowledge on microscopy, staining techniques, cell types and characters.
2. To enrich the knowledge on cell organelles and their role in metabolic activities.
3. To acquire knowledge about cell division and genetic makeup of the cell and its significance.

**Course Outcomes (CO)**

<b>K1 to K5</b>	CO1	Imparting the knowledge on the principles of microscopes
	CO2	Enrich the concepts of the structure and functions of cellular organelles.
	CO3	Understand the structure of chromosome.
	CO4	Gain knowledge on the nucleic acids and DNA repair mechanism.
	CO5	Evaluate the impact of factors in cancer cell formation, diagnostics and treatment.

**Sub.Code: 23UGC3S1**

<b>Programme Code : 06</b>		<b>B.Sc., Zoology</b>		
<b>Course Code: 23UGC3S1</b>		<b>Skill Based Subject 1–Cyber Security</b>		
<b>Batch 2023-2024</b>	<b>Semester III</b>	<b>Hours / Week 2</b>	<b>Total Hours 30</b>	<b>Credits 3</b>

**Course Objectives**

1. The course introduces the basic concepts of Cyber Security
2. To develop an ability to understand about various modes of Cyber Crimes and Preventive measures
3. To understand about the Cyber Legal laws and Punishments

**Course Outcomes (CO)**

<b>K1 to K5</b>	<b>CO1</b>	To Understand the Concepts of Cybercrime and Cyber Frauds
	<b>CO2</b>	To Know about Cyber Terrorism and its preventive measures
	<b>CO3</b>	To Analyze about the Internet, Mobile Phone and E-commerce security issues
	<b>CO4</b>	To Understand about E-mail and Social Media Issues
	<b>CO5</b>	To Describe about various legal responses to Cybercrime

**Sub.Code: 23UZO404**

<b>ProgrammeCode : 06</b>		<b>B.Sc., Zoology</b>	
Core Paper 4 –Physiology			
Batch 2023-2024	Hours / Week 5	Total Hours 75	Credits 5

**Course Objectives**

1. To get knowledge about the nutrition and feeding mechanism
2. To understand the structure and functions of various organ systems in the animal
3. To distinguish the interrelationship within physiological systems

**Course Outcomes (CO)**

<b>K1 to K5</b>	CO1	Remember and recognize the physiological structure and functions of various organs
	CO2	Understand the anatomical knowledge in predicting the physiological consequences
	CO3	Apply the physiological activity of organ system
	CO4	Analyse the types and functions of endocrine glands
	CO5	Evaluate the properties and functions of physiological systems

<b>Programme Code :06</b>	<b>B.Sc., Zoology</b>		
Skill Based Subject 2- Health Education			
Batch 2023-2024	Hours / Week2	Total Hours30	Credits3

### Course Objectives

1. To inculcate knowledge on health education and life styles.
2. To create awareness about the importance of the environment for healthy life.
3. To educate students in relation to health education programmes of public importance.

### Course Outcomes (CO)

<b>K1 to K5</b>	CO1	Remember the knowledge about the concept of health
	CO2	Understand the role of Nutrition in Man
	CO3	Apply the knowledge on various environmental pollution and diseases and their impacts on Man
	CO4	Analyse the Prevention and control of communicable and non-communicable diseases.
	CO5	Evaluate the Basic Knowledge of health care schemes

**Sub.Code: 23UZO4CM**

<b>Programme Code : 06</b>	<b>B.Sc., Zoology</b>		
Core Practical - 2 Cell and Molecular Biology and Physiology			
Batch 2023-2024	Hours / Week 2	Total Hours 60	Credits 2

**Course Objectives**

1. To impart practical knowledge on different types of blood cells.
2. To understand mitotic and meiotic division of cells.
3. To learn the physiological process of oxygen consumption, osmoregulation and enzyme activity.

**Course Outcomes (CO)**

<b>K3 – K5</b>	CO1	Get the knowledge on the techniques and staining process for identification of different types of cells.
	CO2	Understand the process of mitotic and meiotic cell division.
	CO3	Apply the gained knowledge to study the haemin crystal formation and classification of blood groups.
	CO4	Analyze the physiological process such as oxygen consumption, osmoregulation and enzyme activity.
	CO5	Illustrate the different types of blood cells, physiological processes in our body and its impact on our health.

**Sub.Code: 23UZ0505**

<b>ProgrammeCode : 06</b>	<b>B.Sc., Zoology</b>		
Core Paper – 5 Genetics			
Batch 2023-2024	Hour/Week 5	Total Hours 75	Credits 4

**Course Objectives**

1. To make the students develop a comprehensive knowledge on pioneers in genetics and their contributions.
2. To create knowledge about the application of genetic principles in different populations.
3. To make the students understand the various principles of heredity and apply the genetic principles in mutation and genetic disorders.

**Course Outcomes (CO)**

<b>K1 to K5</b>	CO1	Remembering the Mendelian principles of dominance and co-dominance and interaction among the genes.
	CO2	Understand the genetic linkage, crossing over and sex-linked inheritance in animals
	CO3	Apply the modern concept of gene, mutation and chromosomal aberrations.
	CO4	Analyze the deep knowledge on genetic disorders in man.
	CO5	Evaluate the need of breeding, genetic counseling and its significance.

**Sub.Code: 23UZO506**

<b>ProgrammeCode : 06</b>	<b>B.Sc., Zoology</b>		
Core Paper - 6- Evolution			
Batch 2023-2024	Hour/Week 5	Total Hours 75	Credits 4

**Course Objectives**

1. To learn the evolution of different group of animals
2. To Understand the theories of evolution
3. To acquire knowledge on origin of species

**Course Outcomes (CO)**

<b>K1 to K5</b>	CO1	Understand the theory and concept of evolution
	CO2	Outline the origin of life, zoological time scale and living fossils
	CO3	Explain the evolutionary theory to understand the evolution of animals
	CO4	Analyze the significance of geological time scale and adaptation on the evolution of animals
	CO5	Describe the evidences proposed for the evolution of horse, elephant and man

**Sub.Code: 23UZO507**

<b>ProgrammeCode : 06</b>	<b>B.Sc, Zoology</b>		
Core Paper - 7 – Ecology			
Batch 2023-2024	Hour/Week 5	Total Hours 75	Credits 4

**Course Objectives**

1. To know the fundamental principles that governs the functioning of the environment.
2. To understand the concept of ecosystem and balance of nature.
3. To assess the relationship between environment and organisms.

**Course Outcomes (CO)**

<b>K1 to K5</b>	CO1	Remembering the knowledge about the abiotic and biotic factors of the environment and their significance for ecosystem functioning.
	CO2	Understand the components of the ecosystem
	CO3	Apply knowledge on Community and Habitat ecology at different geographical regions to enhance species specific management
	CO4	Analyze the various types of environmental pollution and its assessment.
	CO5	Evaluate the student's knowledge the ecosystem approach



**Sub.Code: 23UZO508**

<b>Programme Code:06</b>	<b>B.Sc., Zoology</b>		
Core Paper- 8 – Biostatistics and Bioinformatics			
Batch 2023-2024	Hours / Week 5	Total Hours 75	Credits 4

**Course Objectives**

1. To provide the fundamental knowledge on Biostatistics and Bioinformatics in biology.
2. To enhance the knowledge on importance of statistics and Bioinformatics tools in the analysis of Biological data at significance level.
3. To learn the biological databases and apply biostatistics and bioinformatics tools to analyse the structure of the molecules and drug discovery.

**Course Outcomes (CO)**

<b>K1 to K5</b>	CO1	Classify the data collection methods and primary and secondary data analysis
	CO2	Understand the significance of biostatistics in biological sciences and also applied in research work.
	CO3	Apply fundamental knowledge of Biostatistics and bioinformatics tools to Analyse of Biological data generated by research
	CO4	Outline the role of Biostatistics and bioinformatics tools in biological data interpretation.
	CO5	Analyse the application of Biostatistics and Bioinformatics tools on structure prediction of molecules and drug discovery

**Sub.Code: 23UZO609**

<b>Programme Code: 06</b>	<b>B.Sc., Zoology</b>		
Core Paper 9 – Microbiology and Immunology			
Batch 2023-2024	Hours / Week 5	Total Hours 60	Credits 4

### **Course Objectives**

- 1.To update basic knowledge on microorganisms.
- 2.To understand the Disease causing microbes and their pathogenesis.
- 3.To analyze and inculcate knowledge about the immune system and its responses against pathogens.

### **Course Outcomes (CO)**

<b>K1 to K5</b>	CO1	Aware the nature of microbes and its detection techniques.
	CO2	Understand the life process of viruses and its impacts on living organisms.
	CO3	Familiarize the pathogenesis of microbes, and its treatment.
	CO4	Promoting the knowledge on immune cells, immune organs and its functions.
	CO5	Illustrate the immune response against pathogens and its therapeutics.

**Sub.Code: 23UZO610**

<b>Programme Code : 06</b>	<b>B.Sc., Zoology</b>		
Core Paper 10 – Biotechnology			
Batch 2023-2024	Hours / Week 5	Total Hours 60	Credits 4

**Course Objectives**

1. To Learn the theoretical basis of techniques in Genetic Engineering
2. To understand the methods adapted for the industrial production of recombinant products
3. To learn the biosafety and bioethics to understand the social and scientific issues in Biotechnology

**Course Outcomes (CO)**

<b>K1 to K5</b>	CO1	Explain the Basic concepts and tools of Genetic Engineering
	CO2	Discuss the techniques of cloning
	CO3	Apply the knowledge of Gene transfer techniques in cloning and industrial recombinant product production
	CO4	Analyse the impact of applied techniques on the cloning and production of recombinant products
	CO5	Illustrate the impact of Biotechnology on human health and Environment

**Sub.Code: 23UZO611**

<b>Programme Code : 06</b>	<b>B.Sc., Zoology</b>		
Core Paper- 11 – Developmental Biology			
Batch 2023-2024	Hours / Week 5	Total Hours 75	Credits 5

**Course Objectives**

1. To get knowledge about theories of development and gametogenesis.
2. To study the process of fertilization and cleavage of eggs in animals.
3. To understand the embryonic developmental stages and extra embryonic nutrition of animals.

**Course Outcomes (CO)**

<b>K1 to K5</b>	CO1	Remember the laws and theories of development and gametogenesis.
	CO2	Understand the process and different methods of fertilization.
	CO3	Apply the knowledge on various developmental stages of animals.
	CO4	Analyze the importance organogenesis and process of embryonic nutrition.
	CO5	Evaluate the theories, principles and techniques of embryology and its applications in assisted reproductive technology.

**Sub.Code: 23UZO612**

<b>ProgrammeCode : 06</b>	<b>B.Sc., Zoology</b>		
Core Paper 12 – Biodiversity and Animal behaviour			
Batch 2023-2024	Hours / Week 5	Total Hours 75	Credits 4

**Course Objectives**

1. To understand the status and distribution of Fauna.
2. To create awareness on various biodiversity conservation laws for animal protection.
3. To understand the animal behavioural ecology.

**Course Outcome (CO)**

<b>K1. K5</b>	C01	Outline the status and distribution pattern of animals
	C02	Understand the biodiversity threats and its conservation
	C03	Study the people's participation in biodiversity conservation and Biodiversity Acts.
	C04	Understand the various behavior of animals
	C05	Evaluate the biological rhythms.

**Sub.Code: 23UZO6CN**

<b>Programme Code :06</b>	<b>B.Sc., Zoology</b>		
Core Practical 3 Ecology, Developmental Biology, Biodiversity and Animal behaviour			
Batch 2023 -2024	Hour/Week 2	Total Hours 60	Credits 2

**Course Objectives**

1. To inculcate the students to learn the water quality and planktons
2. To demonstrate the developmental stages of chick
3. To study the biodiversity and create awareness about the rearing of silkworm and Earthworm

**Course Outcomes (CO)**

<b>K3 toK5</b>	CO1	Get the practical knowledge about the species identification, diversity and their ecological significance
	CO2	Understand about the species diversity and water pollution due to anthropogenic activity
	CO3	Apply practical knowledge on plankton analysis and assessment of biodiversity
	CO4	Analyze about practical and filed knowledge in relation to environment management
	CO5	Evaluate the various Developmental stages of Chick and Frog

**Sub.Code: 23UZO6CO**

<b>Programme Code : 06</b>	<b>B.Sc., Zoology</b>		
Core practical 4. Genetics , Evolution, Biostatistics, Microbiology and Immunology and Biotechnology			
Batch 2023-2024	Hours / Week 2	Total Hours 60	Credits 2

**Course Objectives**

1. To know the application of various techniques in Microbiology and Biotechnology.
2. To understand the quantitative estimation of biomolecules.
3. Apply and understand the biostatistics in biology and evolutionary significance animals.

**Course Outcomes (CO)**

<b>K3to K5</b>	CO1	Understand the knowledge on microbiology and biotechnological equipments for culture and isolation of microbes.
	CO2	Understand the presence of biomolecules in the tissue and organ from animals.
	CO3	Apply knowledge and understand the immunological techniques for isolation of DNA for sequencing.
	CO4	Study the polytene chromosomes, evolutionary significance of animals and analyze the quality of milk.
	CO5	Understand the importance of antibiotics, biofertilizers and biopesticides for wellbeing of life.

**Sub. Code: 23UZO6Z1**

<b>Programme Code :06</b>	<b>B.Sc., Zoology</b>		
Project and Viva Voce			
Batch 2023-2024	Hour/Week -	Total hours -	Credits 5

### **Course Objectives**

1. To acquire the basic knowledge about research and carry out research problems in the field of zoology.
2. To explore the ability to plan, carryout innovation in project
3. To improve the knowledge on various research methods in zoology

### **Course Outcomes (CO)**

<b>K3to K5</b>	CO1	Get the foundational practical knowledge to carry out research in the specified area.
	CO2	Understand the techniques to be used to carry out the specific research work.
	CO3	Apply the learned techniques to carry out the experiments and obtain the result.
	CO4	Analyse the result by using biostatistical tools and interpret the result.
	CO5	Evaluate the analysed result and conclude the study and highlight its significant outcome



**Sub. Code: 23UZO6S4**

<b>Programme Code : 06</b>	<b>B.Sc, Zoology</b>		
Skill Based Subject 3: Commercial Fish Culture			
Batch 2023-2024	Hour/Week 2	Total Hours 30	Credits 3

**Course Objectives**

1. To develop knowledge in characteristics, structure and resources of fisheries.
2. To increase the fishery sector performance by production, culture practices and farm management.
3. To improve the trade and its contribution to the nation economy.

**Course Outcomes (CO)**

<b>K1 to K5</b>	CO1	Get knowledge about the commercial fish resources from India
	CO2	Understand the biology of commercial fish from India
	CO3	Apply the practical knowledge of hatchery maintenance and Feed formulation for fishes
	CO4	To enrich the knowledge of culture practice in commercial fishes
	CO5	Analyze students acquire technical knowledge which is helpful to find the condition of fishes and their by-product utilization

## **MAJOR ELECTIVE PAPERS**

1. Wildlife Ecology and Management
2. Poultry science and management
3. Economic Zoology
4. Pests and their Management
5. Vermitechnology
6. Human genetics and Counseling

<b>Programme Code: 06</b>	<b>B.Sc., Zoology</b>		
Major Elective 1 - Wildlife Ecology and Management			
Batch 2023-2024	Hours / Week 4	Total Hours 60	Credits 5

### Course Objectives

1. To understand and appreciate biodiversity and the Act to protect the wild species.
2. To learn different techniques to study wildlife and develop knowledge of the benefits of ecosystem.
3. To get knowledge about various methods to conserve biodiversity.

### Course Outcomes (CO)

<b>K1 to K5</b>	CO1	Remember the various components of an ecosystem
	CO2	Understand the wildlife management in India and National Parks and Sanctuaries.
	CO3	Apply the Biodiversity hot spots, Endangered species and their Protection
	CO4	Analyse the Wild life management Techniques and animal plant interaction.
	CO5	Evaluate the students to sampling techniques in various fields

<b>Programme Code: 06</b>	<b>B.Sc., Zoology</b>		
Major Elective Paper 2 –Poultry Science and Management			
Batch 2023-2024	Hour/Week 4	Total Hours 60	Credits 5

### Course Objectives

1. To develop knowledge on the history and the role of poultry in rural development and its structure.
2. To learn the methods of rearing, breeding and production of poultry.
3. To get the knowledge about the preparation of feed, antibiotics, vaccines and marketing.

### Course Outcomes (CO)

<b>K1 - K5</b>	CO1	Remember the knowledge about the importance of poultry farming
	CO2	Understand the types of poultry breeding
	CO3	Apply the knowledge in types of incubators for poultry breeding
	CO4	Analyse the importance of poultry marketing
	CO5	Evaluate the students to organize poultry farming and training in the rural area

<b>Programme Code: 06</b>	<b>B.Sc., Zoology</b>		
Major Elective Paper 3 – Economic Zoology			
Batch 2023-2024	Hours / Week 4	Total Hours 60	Credits 5

### Course Objectives

1. To get knowledge about sustainable agriculture, organic farming and waste management by using Vermitechnology.
2. To understand the rearing and harvesting techniques in sericulture, apiculture and lac culture.
3. To inculcate knowledge on Aquaculture, Poultry and Animal husbandry aspects.

### Course Outcomes (CO)

<b>K1 – K5</b>	CO1	Outline the characteristics and role of earthworms in sustainable agriculture.
	CO2	Describe the examples about the problems in sericulture, apiculture and lac culture.
	CO3	Apply the knowledge on disease management in the field of poultry and animal husbandry.
	CO4	Analyze the economic importance of Apiculture, Lac culture, Poultry and aquaculture.
	CO5	Illustrate the marketing strategies of animal byproducts and create the self-opportunities to students.

<b>Programme Code -06</b>	<b>B.Sc., Zoology</b>		
Major Elective 4- Pests and Their management			
Batch 2023-2024	Hour/Week 4	Total Hours 60	Credits 5

### Course Objectives

1. To acquire information on insect pests and non- insect pests in agricultural crops
2. To get knowledge on biology and nature of damage caused by insect pests and non-insect pests in various crops
3. To understand the impact of insect vector on human and their control measures

### Course Outcomes (CO)

<b>K1 to K5</b>	CO1	Get knowledge about the importance of insect pests of agricultural crops and plant diseases transmitted by insect pests.
	CO2	Understand the biology and nature of damage caused by insect pests and non-insect pests in various crops.
	CO3	Apply the knowledge to study the impact of damage caused by the of stored grains.
	CO4	Analyse the effect of damage caused by pest on agricultural crops and diseases caused to human by insect pests.
	CO5	Discuss the obtained knowledge on impact of pest on agricultural crop and measures for its control.

<b>Programme Code -06</b>	<b>B.Sc. Zoology</b>		
Major Elective 5- Vermitechnology			
Batch 2023-2024	Hour/Week 4	Total hours 60	Credit 5

### Course Objectives

1. To aware the significance of sustainable agriculture and organic farming.
2. To inoculate basic knowledge on recycling of biodegradable waste of different kinds.
3. To understand the value of Vermitechnology and its significance.

### Course Outcomes (CO)

<b>K1 to K5</b>	CO1	Remember the knowledge on the significance of earthworms.
	CO2	Understand the importance of waste degradation by eco-friendly method.
	CO3	Apply the significance of Vermicomposting methods.
	CO4	Analyse the knowledge on commercialization of Vermiproducts.
	CO5	Evaluate the students to learn application of vermicomposting in Agriculture Field

<b>Programme Code: 06</b>	<b>B.Sc., Zoology</b>		
Major Elective Paper 6 -- Human Genetics and Counseling			
Batch	Hour/Week	Total Hours	Credits
2023-2024	4	75	5

### Course Objectives

1. To understand knowledge on the blood types, transfusion and diseases.
2. To know about the applications of aminocentesis, dermatoglyphics and Population genetics.
3. To learn the applications of Genetic engineering and Genetic counseling

### Course Outcomes (CO)

<b>K1 to K5</b>	CO1	Remember the Physiology and genetics of blood groups.
	CO2	Understand the various syndromes and Population genetics.
	CO3	Apply the application of genetic engineering in man.
	CO4	Analyse the genetic counseling and pedigree chart.
	CO5	Evaluate the students to learn about genetic engineering and applications in cancer and AIDS.



## **NON MAJOR ELECTIVE PAPERS**

1. Human Rights
2. Women's Rights
3. Consumer Affairs

<b>Programme Code : 06</b>	<b>B.Sc., Zoology</b>		
Part IV -Non Major Elective – I Human Rights			
Batch 2023-2024	Hours / Week 2	Total Hours 30	Credits 2

### Course Objectives

1. To prepare for responsible citizenship with awareness of the relationship between Human Rights, democracy and development.
2. To impart education on national and international regime on Human Rights.
3. To sensitive students to human suffering and promotion of human life with dignity.
4. To develop skills on human rights advocacy
5. To appreciate the relationship between rights and duties
6. To foster respect for tolerance and compassion for all living creature.

### Course Outcomes (CO)

<b>K1 to K5</b>	CO1	To understand the hidden truth of Human Rights by studying various theories.
	CO2	To acquire overall knowledge regarding Human Rights given by United Nation Commission. (UNO)
	CO3	To gain knowledge about various organs responsible for Human Rights such as National Human Rights Commission and state Human Right commission (UNHCR)
	CO4	To get habits of how to treat aged person, others and positive social responsibilities
	CO5	To treat and confirm, child, refugees and minorities with positive social justice.

<b>Programme Code: 06</b>	<b>For B.A., BBA, B.Com, BCA and B.Sc., Degree Students</b>		
Part IV -Non- Major Elective – II Women’s Rights			
Batch 2022-2023	Hours / Week 2	Total Hours 30	Credits 2

### Objectives

1. To know about the laws enacted to protect Women against violence.
2. To impart awareness about the hurdles faced by Women.
3. To develop a knowledge about the status of all forms of Women to access to justice.
4. To create awareness about Women’s rights.
5. To know about laws and norms pertaining to protection of Women.
6. To understand the articles which enables the Women’s rights.
7. To understand the Special Women Welfare laws.
8. To realize how the violence against Women puts an undue burden on healthcare services.

### Course Outcomes (CO)

<b>K1 to K5</b>	<b>CO1</b>	Understand the importance of Women’s Studies and incorporate Women’s Studies with other fields.
	<b>CO2</b>	Analyze the realities of Women Empowerment, Portrayal of Women in Media, Development and Communication.
	<b>CO3</b>	Interpret the laws pertaining to violence against Women and legal consequences.
	<b>CO4</b>	Study the important elements in the Indian Constitution, Indian Laws for Protection of Women.
	<b>CO5</b>	To be Aware of Government Developmental schemes for women and to create Awareness on modernization and impact of technology on Women.

<b>Programme Code :06</b>	<b>For B.A., B.Sc., and BCA Degree Students</b>		
Non- Major Elective III – Consumer Affairs			
<b>Batch</b>	<b>Hours/Week</b>	<b>Total Hours</b>	<b>Credits</b>
2023-2024	2	30	2

### Course Objectives

1. To familiarize the students with their rights and responsibilities as a consumer.
2. To understand the procedure of redress of consumer complaints.
3. To know more about decisions on Leading Cases by Consumer Protection Act.
4. To get more knowledge about Organizational set-up under the Consumer Protection Act
5. To impart awareness about the Role of Industry Regulators in Consumer Protection
6. To understand Contemporary Issues in Consumer Affairs

### Course Outcomes (CO)

<b>K1 to K5</b>	<b>CO1</b>	Able to know the rights and responsibility of consumers.
	<b>CO2</b>	Understand the importance and benefits of Consumer Protection Act.
	<b>CO3</b>	Applying the role of different agencies in establishing product and service standards.
	<b>CO4</b>	Analyse to handle the business firms' interface with consumers.
	<b>CO5</b>	Assess Quality and Standardization of consumer affairs

**Sub.Code:23UZO5X1**

<b>Programme code : 06</b>	<b>For All UG Programmes</b>			
Human Anatomy (EDC)				
Batch 2023-2024	Semester	Hour/week	Total Hours	Credits
	5	2	30	3

**Course objectives**

1. To make the students to learn about the human body from cellular to system level.
2. To set a strong base in the biology related courses for other major students.
3. To motivate the students to pursue healthcare / bio-inspired courses related higher studies and research.

**Course outcomes (CO)**

<b>K1 to K5</b>	CO1	Remember the different organ system of the human body.
	CO2	Understand the anatomical position and structure of different organ system in human.
	CO3	Apply the knowledge gained on anatomy and function of human organ system in the healthcare.
	CO4	Analyze the role of each organ system for the normal healthy life.
	CO5	Evaluate the physiological function and mechanisms of the organs of all the systems.

**Sub.Code:23UZ01A1**

<b>Programme Code : 06</b>	<b>For B.Sc., Botany, Chemistry and Biochemistry</b>		
Allied A Zoology I			
Batch 2023-2024	Hour/Week 5	Total Hours 75	Credits 4

**Course Objectives**

1. To learn about the taxonomy and characteristics of non-chordate
2. To obtain the knowledge of morphology and anatomy of the animals
3. To understand the biological significance of non-chordates and chordates

**Course Outcomes (CO)**

<b>K1 to K5</b>	CO1	Get knowledge about the classification of various organisms
	CO2	Study and understand the various parasites and protozoan diseases
	CO3	Apply the knowledge on the developmental stages of different animals.
	CO4	Analyze the morphology and anatomy on chordates.
	CO5	Evaluate the biological significance of birds Migration, Parental care in fishes and amphibians.

**Sub.Code:23UZO2A2**

<b>Programme code:06</b>	<b>For B.Sc., Botany, Chemistry and Biochemistry</b>		
Allied A Zoology 2			
Batch 2023-2024	Hour/Week 5	Total Hours 75	Credits 4

**Course Objectives**

1. To acquire the knowledge about the cytology and developmental biology of living animals.
2. To understand the physiology and of digestion.
3. To create the awareness about the environmental pollution and learn about evolutionary modification.

**Course Outcomes (CO)**

<b>K1 to K5</b>	CO1	Acquire the knowledge about the cell organelles and its functions and Genetic disorders.
	CO2	Understand the embryology of frog
	CO3	Analyze the nutritive components of food and the process of digestion and absorption.
	CO4	Apply the comprehension in the field of eco-system and conservation
	CO5	Evaluate the knowledge on the evolutionary significance of animals

**Sub. Code: 23UZO2AL**

<b>Programme code: 06</b>	<b>For B. Sc Botany, Chemistry and Biochemistry</b>		
Allied -A- Practical I Zoology			
Batch 2023-2024	Hour/Week 2	Total Hours 60	Credits 2

**Course Objectives**

1. To observe the various anatomical systems of animals using virtual laboratory.
2. To educate the students about cell division and genetic disorders.
3. To know the developmental stages of frog and identification, observation of planktons.

**Course Outcomes (CO)**

<b>K1 to K5</b>	CO1	Get the knowledge of the parts of various systems of frog, cockroach, Pila and starfish.
	CO2	Understand the structure of few non-chordate and chordate and cells of different tissues.
	CO3	Apply knowledge to differentiate the stages of mitosis and clinical features, chromosomal abnormalities of a few genetic syndromes.
	CO4	Analyze the various stages of gametes development and morphogenetic movements of cells in developing embryo.
	CO5	Evaluate the biological significance of planktons in ecosystem service and observation of their structure.