

**KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)**

*Re-accredited by NAAC with 'A' Grade – 3.64 CGPA out of 4 (3rd Cycle)*

*College of Excellence (UGC)*

*Coimbatore – 641 029*

**DEPARTMENT OF ZOOLOGY (Aided)**

**COURSE OUTCOMES (CO)**

**B.Sc. ZOOLOGY**

**For the students admitted  
In the  
Academic Year 2018-2019**

Programme code:06	B.Sc., Zoology			
Course code: 18UZO101	Core Paper 1 –Non Chordata			
Batch 2018-2019	Semester 1	Hour/Week 7	Total hours 105	Credit 5

### Course Objectives

1. To obtain the knowledge of the taxonomical and characteristics of non chordates
2. To understand the morphological and anatomical features of selected non chordates
3. To create awareness about the harmful parasites and their economic importance of non chordates

### Course Outcomes

K1	CO1	Get knowledge about the systematic position of various organisms
K2	CO2	Understand the various structure and its function of the non chordates
K3	CO3	Get the knowledge about the economically important organisms
K4	CO4	Analyze and understand the important parasites and their control measures

Programme code -06	B.Sc Zoology			
Course code 18UZO1I1	Allied A Paper -I Sericulture -I			
Batch 2018-2019	Semester 1	Hour/Week 5	Total hours 75	Credit 4

### Course Objectives

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

### Course Outcomes

K1	CO1	Get knowledge about the mulberry and non mulberry silkworms.
K2	CO2	Understand the various silkworm rearing techniques
K3	CO3	Apply knowledge on control measures of silkworm diseases
K4	CO4	Analyze silkworm breeding and grainage techniques

Programme code:06	B.Sc. Zoology			
Course code: 18UZO202	Core Paper- 2- Chordata			
Batch 2017-2018	Semester II	Hour/Week 7	Total hours 105	Credit 5

### Course Objectives

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

### Course Outcomes

K1	CO1	Get knowledge about the classification of various organisms
K2	CO2	Understand the various physiological systems of Chordate
K3	CO3	Apply the knowledge in the field of economically important organisms
K4	CO4	Analyze gradual development of habit and habitats of various animals.

Programme code -06	B.Sc Zoology			
Course code 18UZO212	Allied A Paper 2. Sericulture-II			
Batch 2018-2019	Semester II	Hour/Week 5	Total hours 75	Credit 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

K1	COI	Get knowledge about the moriculture
K2	CO2	Understand the cultivation of mulberry, pests, diseases and control measures
K3	CO3	Apply knowledge on processing of cocoons and different methods of silk reeling
K4	CO4	Analyze the importance of sericulture in entrepreneurship development.

Programme code:06	B.Sc. Zoology			
Course code: 18UZO2CL	Core Practical- I-Non Chordata and Chordata			
Batch 2018-2019	Semester I&II	Hour/Week 4	Total hours 120	Credit 5

### Course Objective

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 vertebrate
4. To inculcate the significance of various non chordates.

### Course Outcomes

K3	CO1	Apply knowledge to study various anatomical system by using virtual laboratory
K4	CO2	Analyze the excretory products of certain vertebrates
K5	CO3	Evaluate the biological significance and structure and functions of various animals.

Programme code- 06	B.Sc Zoology			
Course code 18UZO2IL	Allied A Practical 1. Sericulture			
Batch 2018-2019	Semester I&II	Hour/Week 2	Total hours 60	Credit 2

### Course Objectives

1. To inculcate the practical knowledge on moriculture and sericulture, mulberry propagation, pests and diseases and their control measures
2. To know the importance of silkworm rearing, pests and diseases of silkworms and their control measures
3. To analyze the quality of silk through experiments

### Course Outcomes

K1	CO1	Apply knowledge on moriculture and sericulture
K2	CO2	Observe the biology, rearing, pests and diseases of silkworm and their control measures
K3	CO3	Evaluate the quality of silk

Programme Code- 06		B.Sc. Zoology		
Course Code: 18UZO303		Core Paper 3 – Cell Biology		
Batch 2018-2019	Semester III	Hours / Week 5	Total Hours 75	Credits 5

### Course Objectives

1. To provide the fundamental knowledge on cell types and characters.
2. To enhance the knowledge on cell organelles and their role in metabolic activities.
3. To understand the cell division and genetic makeup of the cell and its significance.

### Course Outcomes

K1	CO1	Understand the importance of microscopy and staining techniques.
K2	CO2	Apply knowledge on the metabolic machinery of the cells.
K3	CO3	Analyze the significance of normal and abnormal activities of cells.
K4	CO4	Get knowledge on protein synthesis and cancer biology.



Programme Code : 06		B.Sc.: Zoology		
Course Code 18UZO404		Core Paper 4 –Physiology		
Batch 2018-2019	Semester IV	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

K1	CO1	Explain and recognize the physiological structure and functions of various organs
K2	CO2	Apply anatomical knowledge in predicting the physiological consequences
K3	CO3	Describes physiological activity of organ system
K4	CO4	Distinguishes the types and functions of endocrine glands

Programme code : 06		B.Sc. Zoology		
Course Code 18UZO4CM		Core Practical II –Cell Biology and Physiology		
Batch 2018-2019	Semester IV	Hours / Week 2	Total Hours 30	Credits 2

### Course Objectives

1. To impart the practical knowledge on haematological studies
2. To understand mitotic and meiotic cell divisions
3. To know the principles of biomedical instrumentation and osmoregulation

### Course Outcomes (CO)

K2	CO1	Understand the significance of osmoregulation
K3	CO2	Apply basic principles of haematological and cell studies
K4	CO3	Analyse the principles and uses of bioinstrumentation in medical laboratory
K5	CO4	Evaluate the importance of blood cell counts

Programme code :06		B.Sc. Zoology		
Course Code 18UZO4S2		Skill Based Subject 2- Health Education		
Batch 2018-2019	Semester IV	Hours / Week 2	Total Hours 30	Credits 3

### Course Objectives

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

### Course Outcomes (CO)

K1	CO1	Get knowledge about the concept of health
K2	CO2	Understand the role of Nutrition in Man
K3	CO3	Study various environmental pollution and diseases and their impacts on Man
K4	CO4	Create awareness on prevention and control of diseases

Programme code : 06	B.Sc Zoology			
Course code 18UZO505	Core Paper - 5- Genetics			
Batch 2018-2019	Semester V	Hour/Week 5	Total hours 75	Credit 4

### Course Objectives

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

### Course Outcomes

K1	CO1	Get knowledge about the Mendelian principles in dominance and Co- dominance.
K2	CO2	Understand the genetic linkage, crossing over and sex- linked inheritance in animals
K3	CO3	Analyze the Genetic disorders in Man
K4	CO4	Evaluate the need of genetic counseling and its significance.

Programme code : 06	B.Sc. Zoology			
Course code 18UZO506	Core Paper -6- Evolution			
Batch 2018-2019	Semester V	Hour/Week 5	Total hours 75	Credit 5

### Course Objectives

1. Obtain the knowledge of animal behavior
2. Understand the concept of biological clock and circadian rhythm
3. Students can learn the processes of origin of life

### Course Outcomes

K1	CO1	Get knowledge about the chronology of animals
K2	CO2	Understand the modern synthetic theory of evolution
K3	CO3	Apply the reproductive behavior of animals
K4	CO4	Analyze the significance of geological time scale

Programme Code : 06	B.Sc, Zoology			
Course code 18UZO507	Core Paper - 7 – Ecology			
Batch	Semester	Hour/Week	Total hours	Credit
2018-2019	V	5	75	4

### Course Objectives

1. To know the fundamental principles that govern 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

K1	CO1	Get knowledge about the ecological studies and their significance
K2	CO2	Understand the interlink between living and nonliving resources for an ecosystem management
K3	CO3	Acquire knowledge on Community and Habitat ecology at different geographical regions to enhance species specific management
K4	CO4	Analyze the ecological significance and their management

Programme Code:06		B.Sc. Zoology		
Course Code 18UZO508		Core Paper- 8 – Biostatistics, Biophysics and Bioinformatics		
Batch 2018-2019	Semester V	Hours / Week 5	Total Hours 75	Credits 4

### Course Objectives

1. To provide the fundamental knowledge on instruments, statistical methods and applications.
2. To enhance the knowledge on statistical use and interpret results using descriptive statistical methods.
3. To analyze the level of significance accurately and effectively using proper statistical methods.
4. To learn the applications of computer and its usage in Bioinformatics.

### Course Outcomes

K1	CO1	Get awareness in the data collection, analysis and interpretation of results.
K2	CO2	Understand the significance of biostatistics on biological sciences and also applied in research work.
K3	CO3	Apply fundamental knowledge on principle's and applications of instruments and its usage in projects.
K4	CO4	Analyze the role of computer applications and bioinformatics tools in biological data interpretation.

Programme Code: 06		B.Sc. Zoology		
Course Code 18UZO609		Core Paper 9 – Microbiology and Immunology		
Batch	Semester	Hours / Week	Total Hours	Credits
2018-2019	VI	4	60	4

### Course Objectives

1. To update basic knowledge on microorganisms.
2. To understand the economic importance of microbes in relation to agriculture, industry and medicine.
3. To analyze and inculcate the fundamental knowledge on immune system and immunological responses to antigens.

### Course Outcomes

K1	CO1	Make awareness about the morphology, taxonomy and culture methods of microbes.
K2	CO2	Uptain knowledge on microbes of biosphere.
K3	CO3	Understand the microbial diseases, causative organisms and their control measures.
K4	CO4	Study the immune systems and immune responses.



Programme Code : 06		B.Sc.Zoology		
Course Code 18UZO610		Core Paper 10 – Biotechnology		
Batch 2018-2019	Semester VI	Hours / Week 5	Total Hours 75	Credits 4

### Course Objectives

1. To get knowledge about application oriented aspects
2. To provide a platform to learn the deliberate use of living organisms for human welfare
3. To study the importance of Environmental Biotechnology

### Course Outcomes

K1	CO1	Understand the fermentation technology for production of alcohols, enzymes
K2	CO2	Understand the role of microbes, Biofertilizers and Biopesticides in increasing the crop yield
K3	CO3	Get knowledge on application of Biotechnology on human and animal health care
K4	CO4	Apply Bioremediation technique for the protection of environment

Programme Code : 06		B.Sc.Zoology		
Course Code 18UZO610		Core Paper 10 – Biotechnology		
Batch 2018-2019	Semester VI	Hours / Week 5	Total Hours 75	Credits 4

### Course Objectives

1. To get knowledge about application oriented aspects
2. To provide a platform to learn the deliberate use of living organisms for human welfare
3. To study the importance of Environmental Biotechnology

### Course Outcomes

K1	CO1	Understand the fermentation technology for production of alcohols, enzymes
K2	CO2	Understand the role of microbes, Biofertilizers and Biopesticides in increasing the crop yield
K3	CO3	Get knowledge on application of Biotechnology on human and animal health care
K4	CO4	Apply Bioremediation technique for the protection of environment

Programme Code : 06		B.Sc. Zoology		
Course Code 18UZO611		Core Paper- 11 – Developmental Biology		
Batch 2018-2019	Semester VI	Hours / Week 5	Total Hours 75	Credits 4

### Course Objectives

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

### Course Outcomes

K1	COI	Study the laws and theories of development and gametogenesis.
K2	CO2	Understand the process and different methods of fertilization.
K3	CO3	Apply the knowledge on various developmental stages of animals.
K4	CO4	Analyze the importance and knowledge on embryonic nutrition.

Programme Code : 06		B.Sc, Zoology		
Course Code 18UZO612		Core Paper 12 – Biodiversity and Animal behaviour		
Batch 2018-2019	Semester VI	Hours / Week 4	Total Hours 60	Credits 4

### Course Objectives

1. To understand the present status of Fauna.
2. To create awareness on conservation of endangered species.
3. To understand the comparison of ancient and recent information about the biodiversity.

### Course Outcome

K1	CO1	Get knowledge about the endangered and extinct species.
K2	CO2	Compare the ancient and recent information about biodiversity
K3	CO3	Apply the knowledge in Inventorying new species and find out the species extinction rate.
K4	CO4	Analyze the significance various ecosystem and conservation of biodiversity

Programme Code : 06		B.Sc., Zoology		
Course Code 18UZO6CN		Core practical 3. Evolution, Microbiology and Immunology and Biotechnology		
Batch 2018-2019	Semester VI	Hours / Week 2	Total Hours 60	Credits 2

### Course Objectives

1. To know the application of various techniques in genetic engineering
2. To understand the gene sequencing in Eukaryotes
3. To develop the strategies for the biodiversity conservation

### Course Outcomes

K2	CO1	Understand more knowledge in the operations of advanced Biotechnological equipments
K3	CO2	Apply the products obtained through microorganisms
K4	CO3	Analyze practical information in animal cell culture and plant cell culture
K5	CO4	Evaluate the values of biofertilizers and biopesticides for the healthy society

Programme Code :06	B.Sc, Zoology			
Course code 18UZO6CO	Core Practical 4. Ecology, Developmental Biology and Animal Diversity			
Batch	Semester	Hour/Week	Total hours	Credit
2018-2019	VI	2	60	2

### Course Outcomes

K2	CO1	Get practical knowledge about the species identification, diversity and their ecological significance
K3	CO2	Understand about the species diversity and water pollution due to anthropogenic activity
K4	CO3	Apply practical knowledge on plankton analysis, sericulture, vermiculture, and pest management.
K5	CO4	Analyze about practical and filed knowledge in relation to environment management

Programme Code :06	B.Sc, Zoology			
Course code 18UZO6Z1	Project Work and Viva - Voce			
Batch	Semester	Hour/Week	Total hours	Credit
2018-2019	VI	3	45	5

### Course Objectives

1. To acquire the basic knowledge about research and carryout research problems in zoology.
2. To explore the ability to plan carryout innovative project in group
3. To improve the knowledge on various research methods in zoology

### Course Outcomes

K2	CO1	Use foundational practical knowledge to carry out research in the specified area.
K3	CO2	Analyze the results and to collect the basic information in zoology.
K4	CO3	Evaluate the research findings and present them in written and oral.
K5	CO4	Implement the research findings for the upliftment of mankind

Programme Code : 06	B.Sc, Zoology			
Course code 18UZO6S4	Skill Based Subject 3 Commercial Fish Culture			
Batch	Semester	Hour/Week	Total hours	Credit
2018-2019		2	30	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

K1	CO1	Get knowledge about the commercial production of fishes in India
K2	CO2	Understand the practices of fish culture and its management to produce quality fish for human consumption
K3	CO3	Apply practical knowledge into fish production and marketing to become successful entrepreneur
K4	CO4	Analyze students acquired technical knowledge which is helpful to begin an entrepreneurship in the field of Fisheries



Programme Code: 06	B.Sc. Zoology		
	Major Elective 1 - Wild Life Ecology and Management		
Batch 2018-2019	Hours / Week 3	Total Hours 45	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 wild life and develop knowledge of the benefits of ecosystem.
3. To get knowledge the about various methods to conserve biodiversity.

### Course Outcomes

K1	CO1	Explain the various components of an ecosystem
K2	CO2	Describe the wildlife management in India and National Parks and Sanctuaries.
K3	CO3	Analyze the Biodiversity hot spots, Endangered species and their Protection
K4	CO4	Evaluate the Wild life management Techniques and animal plant interaction.

Programme code: 06	B.Sc Zoology		
	Major Elective Paper 2 –Poultry Science and Management		
Batch 2018-19	Hour/Week	Total hours	Credit
	3	45	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

K1	CO1	Get knowledge about the importance of poultry farming
K2	CO2	Understand the types of poultry breeding
K3	CO3	Apply the knowledge in types of incubators for poultry breeding
K4	CO4	Evaluate the importance of poultry marketing

Programme code: 06	B.Sc. Zoology		
	Major Elective Paper 3 – Economic Zoology		
Batch 2018-2019	Hours / Week 4	Total Hours 60	Credits 5

### Course Objectives

1. To get knowledge about sustainable agriculture, organic farming and waste management 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

K1	CO1	Get knowledge about the characteristics and role of earthworm in sustainable agriculture.
K2	CO2	Understand the problems in sericulture, apiculture and lac culture.
K3	CO3	Apply the knowledge on disease management in the field of poultry and animal husbandry.
K4	CO4	Analyze the economic importance of fisheries and aquaculture.

Programme code - 06	B.Sc Zoology		
	Major Elective 4- Pests and Their management		
Batch 2018-2019	Hour/Week 3	Total hours 45	Credit 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 learn knowledge about the insect vector of human and their control measures

### Course Outcomes

K1	CO1	Get knowledge about the importance of insect pests of agricultural crops and plant diseases transmitted by insect pests.
K2	CO2	Understand the biology and nature of damage caused by insect pests and non insect pests in various crops
K3	CO3	Study the insect pests of stored grains
K4	CO4	Apply knowledge on the importance of vectors on human health and their control measures

Programme Code: 06	B.Sc. Zoology		
	Major Elective Paper 5- Vermitechnology		
Batch 2018-2019	Hours / Week 3	Total Hours 45	Credits 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. 2. To understand the value of Vermitechnology and its significance.

### Course Outcomes

K1	CO1	Get knowledge on the significance of earthworms.
K2	CO2	Understand the importance of waste degradation by eco-friendly method.
K3	CO3	Apply the significance of Vermicomposting methods.
K4	CO4	Apply knowledge on commercialization of Vermiproducts.

Programme code: 06	B.Sc., Zoology		
	Major Elective Paper 6 -- Human Genetics and Counselling		
Batch	Hour/Week	Total hours	Credit
2018-2019	3	45	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

K1	CO1	Explain the Physiology and genetics of blood groups.
K2	CO2	Describe the various syndromes and Population genetics.
K3	CO3	Analyses the application of genetic engineering in man.
K4	CO4	Evaluate the genetic counselling and pedigree chart.

Programme code 06	(For B.Sc Botany, Biochemistry and Biotechnology)			
Course code 18UZO5X1	Ornamental Fishery Technology (EDC)			
Batch	Semester	Hour/Week	Total hours	Credit
2018-2019	5	2	30	3

### Course Objective

1. To study ornamental fishes in world wide
2. To study the techniques of ornamental fish culture for employment opportunities
3. To know about the viable marketing strategies in India and international level

### Course Outcomes

K1	CO1	Get field knowledge for design and construction of aquarium.
K2	CO2	Understand the formulation of feed and nutrition management for betterment of ornamental fish culture
K3	CO3	Apply knowledge on health management for successful production of aquarium fishes.
K4	CO4	Analyze the breeding and culture techniques for the trading.

Programme code : 06	For B.Sc Botany, Chemistry and Biochemistry			
Course code 18UZO1A1	Allied A Paper I Non chordata and chordata			
Batch	Semester	Hour/Week	Total hours	Credit
2018-2019	1	5	75	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

K1	CO1	Get knowledge about the classification of various organisms
K2	CO2	Understand the developmental stages of different animals
K3	CO3	Study the parasites and control measures
K4	CO4	Study the morphology and anatomy on chordates



Programme code:06	For B.Sc Botany, Chemistry and Biochemistry			
Course code: 18UZO2A2	Allied A Paper 2 Cell biology, Genetics, Embryology, Physiology, Ecology and Evolution			
Batch	Semester	Hour/Week	Total hours	Credit
2018-2019	II	4	75	4

### Course Objective

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 the evolutionary modification.

### Course Outcomes

K1	CO1	Get knowledge about the cell and its functions
K2	CO2	Understand the embryology of frog
K3	CO3	Apply the knowledge in the field of nutrition in man and conservation of eco system
K4	CO4	Obtain knowledge of the evolutionary significance of animals

Programme code 06	For B.Sc Botany, Chemistry and Biochemistry			
Course code 18UZO2AL	Allied –A- Practical I Zoology			
Batch 2018-2019	Semester I&II	Hour/Week 2	Total hours 60	Credit 2

### Course Objectives

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

### Course Outcomes

K3	CO1	Apply knowledge on identifying non-chordate and chordate
K4	CO2	Analyze the biology and economic importance of non-chordate and chordates
K5	CO3	Evaluate the biological significance of animals

Programme code : 06	Core Paper 1.Basics of beekeeping			
Course code 18UDZA101				
Batch 2018-2019	Semester	Hours/Week 2	Total hours 30	Credit 2

### Course Objectives

1. To identify the different species of honey bees
2. To understand the structure and function of a honey bee hive.
3. To understand the basic biology of honey bees
4. To identify the pest and diseases of honey bees

### Course Outcomes

K1	CO1	Get knowledge and explain the honey bee species and role in agriculture
K2	CO2	Describe biology and structural adaptations of honey bees
K3	CO3	Develop knowledge about honey bee pest and diseases and their control measure.
K4	CO4	Educate the students for the role of honey bees in pollination

Programme code : 06	Core Paper 2. Beekeeping techniques			
Course code 18UDZA202				
Batch 2018-2019	Semester	Hours/Week 2	Total hours 30	Credit 2

### Course Objectives

1. To develop skills about beekeeping management techniques.
2. To educate the students for the importance of beekeeping and honey processing in relation with entrepreneurship development
3. To aware the role of honey bees in pollination
4. To educate the students for value added products in honey

### Course Outcomes

K1	CO1	Get knowledge about basic beekeeping techniques
K2	CO2	Describe parts of bee hive and beekeeping equipments
K3	CO3	Develop knowledge about honey harvest and honey processing methods.
K4	CO4	Educate the students for value added products in honey and role of honey bees in pollination

Programme code 06	Core Practical-1. Beekeeping			
Course code 18UDZA2CL				
Batch 2018-2019	Semester	Hours/Week 2	Total hours 30	Credit 2

### Course Objectives

1. To identify the honey bee species, races and castes
2. To understand the behavior and physiology of honey bees
3. To know the importance of honey bees and hive products
4. To develop knowledge about value added products in honey

### Course outcomes

K1	CO1	Supply knowledge in identifying honey bee species, races and castes
K2	CO2	Analyze the behavior, importance and physiology of honey bees
K3	CO3	Field visit to study the apiary management techniques and honey harvesting methods
K4	CO4	Demonstrate the students for value added products in honey

## **PAPER 1 – Aquarium design, fabrications, and entrepreneurship development**

TotalCredits:5

Total Hours: 75

### **Objectives**

- 1) To inculcate importance of ornamental fish production in relation with trade for entrepreneurship development.
- 2) To give students knowledge about various techniques of Design, fabrication and filtration for aquarium maintenance
- 3) To teach techniques to understand about aquarium setting and accessories involved for construction of aquarium and its maintenance.

### **Course Outcomes**

K1	COI	Get knowledge about the commercial ornamental fish production of in India
K2	CO2	Understand the practices of ornamental fish culture and its management to export worldwide
K3	CO3	Apply practical knowledge into fish production and marketing to become successful entrepreneur
K4	CO4	Analyze students acquired technical knowledge which is helpful to begin an entrepreneurship in the field of ornamental Fisheries

## **PAPER 2 – Aquarium - Best Management Practices (BMP)**

**TotalCredits:5**

**Total Hours: 75**

### **Objectives**

1. To impart knowledge about the various management practices for successful production of ornamental fishes
2. To teach students about culture of livefeeds, techniques involved to manufacture artificial feed and health management for ornamental fishes.
3. To understand the cost effective ornamental fish production by adoption of Best Management Practices (BMP)

### **Course Outcomes**

K1	COI	Get field knowledge for design and construction of aquarium.
K2	CO2	Understand the formulation of feed and nutrition management for betterment of ornamental fish culture
K3	CO3	Apply knowledge on health management for successful production of aquarium fishes.
K4	CO4	Analyze the breeding and culture techniques for the trading.

### **PAPER 3 – Aquarium (plants, fishes) production and Trade**

**TotalCredits:5**

**Total Hours: 75**

#### **Objectives**

- 1.To impart knowledge on ornamental fish production and trade for develop entrepreneurship for uplift livelihood
2. To inculcate technical knowledge on ornamental fish production and its marketing to make them self sustainable after course.
3. To provide self employment opportunities and knowledge for students.

#### **Course Outcomes**

K1	COI	Get knowledge about the production of ornamental plants and fish species
K2	CO2	Understand the ornamental fish breeding and rearing techniques to generate self employment
K3	CO3	Apply knowledge into the ornamental fishculture field to avoid production risks and enhance production level
K4	CO4	Analyze technical knowledge useful for consultancy, marketing and entrepreneurship development in the field of ornamental fishculture



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**DEPARTMENT OF ZOOLOGY (Aided)**

**COURSE OUTCOMES (CO)**

**B.Sc. ZOOLOGY**

**For the students admitted  
In the  
Academic Year 2019-2020**

Programme code:06	B.Sc., Zoology			
Course code: 19UZO101	Core Paper 1 – Invertebrata			
Batch 2019-2020	Semester 1	Hour/Week 7	Total hours 105	Credit 5

### Course Objectives

1. To obtain the knowledge of the taxonomical and characteristics of non chordates
2. To understand the morphological and anatomical features of selected non chordates
3. To create awareness about the harmful parasites and their economic importance of non chordates

### Course Outcomes

K1	CO1	Get knowledge about the systematic position of various organisms
K2	CO2	Understand the various structure and its function of the non chordates
K3	CO3	Get the knowledge about the economically important organisms
K4	CO4	Analyze and understand the important parasites and their control measures

Programme code -06	B.Sc Zoology			
Course code 19UZO1I1	Allied A Paper -I Sericulture -I			
Batch 2019-2020	Semester 1	Hour/Week 5	Total hours 75	Credit 4

### Course Objectives

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

### Course Outcomes

K1	CO1	Get knowledge about the mulberry and non mulberry silkworms.
K2	CO2	Understand the various silkworm rearing techniques
K3	CO3	Apply knowledge on control measures of silkworm diseases
K4	CO4	Analyze silkworm breeding and grainage techniques

Programme code:06	B.Sc. Zoology			
Course code: 19UZO202	Core Paper- 2- Chordata			
Batch 2017-2019	Semester II	Hour/Week 7	Total hours 105	Credit 5

### Course Objectives

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

### Course Outcomes

K1	CO1	Get knowledge about the classification of various organisms
K2	CO2	Understand the various physiological systems of Chordate
K3	CO3	Apply the knowledge in the field of economically important organisms
K4	CO4	Analyze gradual development of habit and habitats of various animals.

Programme code -06	B.Sc Zoology			
Course code 19UZO212	Allied A Paper 2. Sericulture-II			
Batch 2019-2020	Semester II	Hour/Week 5	Total hours 75	Credit 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

K1	CO1	Get knowledge about the moriculture
K2	CO2	Understand the cultivation of mulberry, pests, diseases and control measures
K3	CO3	Apply knowledge on processing of cocoons and different methods of silk reeling
K4	CO4	Analyze the importance of sericulture in entrepreneurship development.

Programme code:06	B.Sc. Zoology			
Course code: 19UZO2CL	Core Practical- I- Invertebrata and Chordata			
Batch 2019-2020	Semester I&II	Hour/Week 4	Total hours 120	Credit 5

### Course Objective

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 vertebrate
4. To inculcate the significance of various non chordates.

### Course Outcomes

K3	COI	Apply knowledge to study various anatomical system by using virtual laboratory
K4	CO2	Analyze the excretory products of certain vertebrates
K5	CO3	Evaluate the biological significance and structure and functions of various animals.

Programme code- 06	B.Sc Zoology			
Course code 19UZO2IL	Allied A Practical 1. Sericulture			
Batch 2019-2020	Semester I&II	Hour/Week 2	Total hours 60	Credit 2

### Course Objectives

1. To inculcate the practical knowledge on moriculture and sericulture, mulberry propagation, pests and diseases and their control measures
2. To know the importance of silkworm rearing, pests and diseases of silkworms and their control measures
3. To analyze the quality of silk through experiments

### Course Outcomes

K1	CO1	Apply knowledge on moriculture and sericulture
K2	CO2	Observe the biology, rearing, pests and diseases of silkworm and their control measures
K3	CO3	Evaluate the quality of silk

Programme Code- 06		B.Sc. Zoology		
Course Code: 19UZO303		Core Paper 3 – Cell and Molecular Biology		
Batch 2019-2020	Semester III	Hours / Week 5	Total Hours 75	Credits 5

### Course Objectives

1. To provide the fundamental knowledge on cell types and characters.
2. To enhance the knowledge on cell organelles and their role in metabolic activities.
3. To understand the cell division and genetic makeup of the cell and its significance.

### Course Outcomes

K1	CO1	Understand the importance of microscopy and staining techniques.
K2	CO2	Apply knowledge on the metabolic machinery of the cells.
K3	CO3	Analyze the significance of normal and abnormal activities of cells.
K4	CO4	Get knowledge on protein synthesis and cancer biology.



Programme Code : 06		B.Sc.: Zoology		
Course Code 19UZO404		Core Paper 4 –Physiology		
Batch 2019-2020	Semester IV	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

K1	CO1	Explain and recognize the physiological structure and functions of various organs
K2	CO2	Apply anatomical knowledge in predicting the physiological consequences
K3	CO3	Describes physiological activity of organ system
K4	CO4	Distinguishes the types and functions of endocrine glands

Programme code : 06		B.Sc. Zoology		
Course Code 19UZO4CM		Core Practical II –Cell Biology and Physiology		
Batch 2019-2020	Semester IV	Hours / Week 2	Total Hours 30	Credits 2

### Course Objectives

1. To impart the practical knowledge on haematological studies
2. To understand mitotic and meiotic cell divisions
3. To know the principles of biomedical instrumentation and osmoregulation

### Course Outcomes (CO)

K2	CO1	Understand the significance of osmoregulation
K3	CO2	Apply basic principles of haematological and cell studies
K4	CO3	Analyse the principles and uses of bioinstrumentation in medical laboratory
K5	CO4	Evaluate the importance of blood cell counts

Programme code :06		B.Sc. Zoology		
Course Code 19UZO4S2		Skill Based Subject 2- Health Education		
Batch	Semester	Hours / Week	Total Hours	Credits
2019-2020	IV	2	30	3

### Course Objectives

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

### Course Outcomes (CO)

K1	CO1	Get knowledge about the concept of health
K2	CO2	Understand the role of Nutrition in Man
K3	CO3	Study various environmental pollution and diseases and their impacts on Man
K4	CO4	Create awareness on prevention and control of diseases

Programme code : 06	B.Sc Zoology			
Course code 19UZO505	Core Paper - 5- Genetics			
Batch 2019-2020	Semester V	Hour/Week 5	Total hours 75	Credit 4

### Course Objectives

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

### Course Outcomes

K1	CO1	Get knowledge about the Mendelian principles in dominance and Co- dominance.
K2	CO2	Understand the genetic linkage, crossing over and sex- linked inheritance in animals
K3	CO3	Analyze the Genetic disorders in Man
K4	CO4	Evaluate the need of genetic counseling and its significance.

Programme code : 06	B.Sc. Zoology			
Course code 19UZO506	Core Paper -6- Evolution			
Batch 2019-2020	Semester V	Hour/Week 5	Total hours 75	Credit 5

### Course Objectives

1. Obtain the knowledge of animal behavior
2. Understand the concept of biological clock and circadian rhythm
3. Students can learn the processes of origin of life

### Course Outcomes

K1	CO1	Get knowledge about the chronology of animals
K2	CO2	Understand the modern synthetic theory of evolution
K3	CO3	Apply the reproductive behavior of animals
K4	CO4	Analyze the significance of geological time scale

Programme Code : 06	B.Sc, Zoology			
Course code 19UZO507	Core Paper - 7 – Ecology			
Batch	Semester	Hour/Week	Total hours	Credit
2019-2020	V	5	75	4

### Course Objectives

1. To know the fundamental principles that govern 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

K1	CO1	Get knowledge about the ecological studies and their significance
K2	CO2	Understand the interlink between living and nonliving resources for an ecosystem management
K3	CO3	Acquire knowledge on Community and Habitat ecology at different geographical regions to enhance species specific management
K4	CO4	Analyze the ecological significance and their management

Programme Code:06		B.Sc. Zoology		
Course Code 19UZO508		Core Paper- 8 – Biostatistics and Bioinformatics		
Batch 2019-2020	Semester V	Hours / Week 5	Total Hours 75	Credits 4

### Course Objectives

1. To provide the fundamental knowledge on instruments, statistical methods and applications.
2. To enhance the knowledge on statistical use and interpret results using descriptive statistical methods.
3. To analyze the level of significance accurately and effectively using proper statistical methods.
4. To learn the applications of computer and its usage in Bioinformatics.

### Course Outcomes

K1	CO1	Get awareness in the data collection, analysis and interpretation of results.
K2	CO2	Understand the significance of biostatistics on biological sciences and also applied in research work.
K3	CO3	Apply fundamental knowledge on principle's and applications of instruments and its usage in projects.
K4	CO4	Analyze the role of computer applications and bioinformatics tools in biological data interpretation.

Programme Code: 06		B.Sc. Zoology		
Course Code 19UZO609		Core Paper 9 – Microbiology and Immunology		
Batch	Semester	Hours / Week	Total Hours	Credits
2019-2020	VI	4	60	4

### Course Objectives

1. To update basic knowledge on microorganisms.
2. To understand the economic importance of microbes in relation to agriculture, industry and medicine.
3. To analyze and inculcate the fundamental knowledge on immune system and immunological responses to antigens.

### Course Outcomes

K1	CO1	Make awareness about the morphology, taxonomy and culture methods of microbes.
K2	CO2	Uptain knowledge on microbes of biosphere.
K3	CO3	Understand the microbial diseases, causative organisms and their control measures.
K4	CO4	Study the immune systems and immune responses.



Programme Code : 06		B.Sc.Zoology		
Course Code 19UZO610		Core Paper 10 – Biotechnology		
Batch 2019-2020	Semester VI	Hours / Week 5	Total Hours 75	Credits 4

### Course Objectives

1. To get knowledge about application oriented aspects
2. To provide a platform to learn the deliberate use of living organisms for human welfare
3. To study the importance of Environmental Biotechnology

### Course Outcomes

K1	CO1	Understand the fermentation technology for production of alcohols, enzymes
K2	CO2	Understand the role of microbes, Biofertilizers and Biopesticides in increasing the crop yield
K3	CO3	Get knowledge on application of Biotechnology on human and animal health care
K4	CO4	Apply Bioremediation technique for the protection of environment

Programme Code : 06		B.Sc.Zoology		
Course Code 19UZO610		Core Paper 10 – Biotechnology		
Batch 2019-2020	Semester VI	Hours / Week 5	Total Hours 75	Credits 4

### Course Objectives

1. To get knowledge about application oriented aspects
2. To provide a platform to learn the deliberate use of living organisms for human welfare
3. To study the importance of Environmental Biotechnology

### Course Outcomes

K1	CO1	Understand the fermentation technology for production of alcohols, enzymes
K2	CO2	Understand the role of microbes, Biofertilizers and Biopesticides in increasing the crop yield
K3	CO3	Get knowledge on application of Biotechnology on human and animal health care
K4	CO4	Apply Bioremediation technique for the protection of environment

Programme Code : 06		B.Sc. Zoology		
Course Code 19UZO611		Core Paper- 11 – Developmental Biology		
Batch	Semester	Hours / Week	Total Hours	Credits
2019-2020	VI	5	75	4

### Course Objectives

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

### Course Outcomes

K1	CO1	Study the laws and theories of development and gametogenesis.
K2	CO2	Understand the process and different methods of fertilization.
K3	CO3	Apply the knowledge on various developmental stages of animals.
K4	CO4	Analyze the importance and knowledge on embryonic nutrition.

Programme Code : 06		B.Sc, Zoology		
Course Code 19UZO612		Core Paper 12 – Biodiversity and Animal behaviour		
Batch 2019-2020	Semester VI	Hours / Week 4	Total Hours 60	Credits 4

### Course Objectives

1. To understand the present status of Fauna.
2. To create awareness on conservation of endangered species.
3. To understand the comparison of ancient and recent information about the biodiversity.

### Course Outcome

K1	CO1	Get knowledge about the endangered and extinct species.
K2	CO2	Compare the ancient and recent information about biodiversity
K3	CO3	Apply the knowledge in Inventorying new species and find out the species extinction rate.
K4	CO4	Analyze the significance various ecosystem and conservation of biodiversity

Programme Code : 06		B.Sc., Zoology		
Course Code 19UZO6CN		Core practical 3. Evolution, Microbiology and Immunology and Biotechnology		
Batch 2019-2020	Semester VI	Hours / Week 2	Total Hours 60	Credits 2

### Course Objectives

1. To know the application of various techniques in genetic engineering
2. To understand the gene sequencing in Eukaryotes
3. To develop the strategies for the biodiversity conservation

### Course Outcomes

K2	CO1	Understand more knowledge in the operations of advanced Biotechnological equipments
K3	CO2	Apply the products obtained through microorganisms
K4	CO3	Analyze practical information in animal cell culture and plant cell culture
K5	CO4	Evaluate the values of biofertilizers and biopesticides for the healthy society

Programme Code :06	B.Sc, Zoology			
Course code 19UZO6CO	Core Practical 4. Ecology, Developmental Biology and Animal Diversity			
Batch	Semester	Hour/Week	Total hours	Credit
2019-2020	VI	2	60	2

### Course Outcomes

K2	CO1	Get practical knowledge about the species identification, diversity and their ecological significance
K3	CO2	Understand about the species diversity and water pollution due to anthropogenic activity
K4	CO3	Apply practical knowledge on plankton analysis, sericulture, vermiculture, and pest management.
K5	CO4	Analyze about practical and filed knowledge in relation to environment management

Programme Code :06	B.Sc, Zoology			
Course code 19UZO6Z1	Project Work and Viva - Voce			
Batch	Semester	Hour/Week	Total hours	Credit
2019-2020	VI	3	45	5

### Course Objectives

1. To acquire the basic knowledge about research and carryout research problems in zoology.
2. To explore the ability to plan carryout innovative project in group
3. To improve the knowledge on various research methods in zoology

### Course Outcomes

K2	CO1	Use foundational practical knowledge to carry out research in the specified area.
K3	CO2	Analyze the results and to collect the basic information in zoology.
K4	CO3	Evaluate the research findings and present them in written and oral.
K5	CO4	Implement the research findings for the upliftment of mankind

Programme Code : 06	B.Sc, Zoology			
Course code 19UZO6S4	Skill Based Subject 3 Commercial Fish Culture			
Batch	Semester	Hour/Week	Total hours	Credit
2019-2020		2	30	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

K1	CO1	Get knowledge about the commercial production of fishes in India
K2	CO2	Understand the practices of fish culture and its management to produce quality fish for human consumption
K3	CO3	Apply practical knowledge into fish production and marketing to become successful entrepreneur
K4	CO4	Analyze students acquired technical knowledge which is helpful to begin an entrepreneurship in the field of Fisheries



Programme Code: 06	B.Sc. Zoology		
	Major Elective 1 - Wild Life Ecology and Management		
Batch 2019-2020	Hours / Week 3	Total Hours 45	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 wild life and develop knowledge of the benefits of ecosystem.
3. To get knowledge the about various methods to conserve biodiversity.

### Course Outcomes

K1	CO1	Explain the various components of an ecosystem
K2	CO2	Describe the wildlife management in India and National Parks and Sanctuaries.
K3	CO3	Analyze the Biodiversity hot spots, Endangered species and their Protection
K4	CO4	Evaluate the Wild life management Techniques and animal plant interaction.

Programme code: 06	B.Sc Zoology		
	Major Elective Paper 2 –Poultry Science and Management		
Batch	Hour/Week	Total hours	Credit
2019-20	3	45	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

K1	CO1	Get knowledge about the importance of poultry farming
K2	CO2	Understand the types of poultry breeding
K3	CO3	Apply the knowledge in types of incubators for poultry breeding
K4	CO4	Evaluate the importance of poultry marketing

Programme code: 06	B.Sc. Zoology		
	Major Elective Paper 3 – Economic Zoology		
Batch 2019-2020	Hours / Week 4	Total Hours 60	Credits 5

### Course Objectives

1. To get knowledge about sustainable agriculture, organic farming and waste management 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

K1	CO1	Get knowledge about the characteristics and role of earthworm in sustainable agriculture.
K2	CO2	Understand the problems in sericulture, apiculture and lac culture.
K3	CO3	Apply the knowledge on disease management in the field of poultry and animal husbandry.
K4	CO4	Analyze the economic importance of fisheries and aquaculture.

Programme code - 06	B.Sc Zoology		
	Major Elective 4- Pests and Their management		
Batch 2019-2020	Hour/Week 3	Total hours 45	Credit 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 learn knowledge about the insect vector of human and their control measures

### Course Outcomes

K1	CO1	Get knowledge about the importance of insect pests of agricultural crops and plant diseases transmitted by insect pests.
K2	CO2	Understand the biology and nature of damage caused by insect pests and non insect pests in various crops
K3	CO3	Study the insect pests of stored grains
K4	CO4	Apply knowledge on the importance of vectors on human health and their control measures

Programme Code: 06	B.Sc. Zoology		
	Major Elective Paper 5- Vermitechnology		
Batch 2019-2020	Hours / Week 3	Total Hours 45	Credits 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

K1	CO1	Get knowledge on the significance of earthworms.
K2	CO2	Understand the importance of waste degradation by eco-friendly method.
K3	CO3	Apply the significance of Vermicomposting methods.
K4	CO4	Apply knowledge on commercialization of Vermiproducts.

Programme code: 06	B.Sc., Zoology		
	Major Elective Paper 6 -- Human Genetics and Counselling		
Batch	Hour/Week	Total hours	Credit
2019-2020	3	45	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

K1	CO1	Explain the Physiology and genetics of blood groups.
K2	CO2	Describe the various syndromes and Population genetics.
K3	CO3	Analyses the application of genetic engineering in man.
K4	CO4	Evaluate the genetic counselling and pedigree chart.

Programme code 06	(For B.Sc Botany, Biochemistry and Biotechnology)			
Course code 19UZO5X1	Ornamental Fishery Technology (EDC)			
Batch	Semester	Hour/Week	Total hours	Credit
2019-2020	5	2	30	3

### Course Objective

1. To study ornamental fishes in world wide
2. To study the techniques of ornamental fish culture for employment opportunities
3. To know about the viable marketing strategies in India and international level

### Course Outcomes

K1	CO1	Get field knowledge for design and construction of aquarium.
K2	CO2	Understand the formulation of feed and nutrition management for betterment of ornamental fish culture
K3	CO3	Apply knowledge on health management for successful production of aquarium fishes.
K4	CO4	Analyze the breeding and culture techniques for the trading.

Programme code : 06	For B.Sc Botany, Chemistry and Biochemistry			
Course code 19UZO1A1	Allied A Paper I Invertebrata and chordata			
Batch	Semester	Hour/Week	Total hours	Credit
2019-2020	1	5	75	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

K1	CO1	Get knowledge about the classification of various organisms
K2	CO2	Understand the developmental stages of different animals
K3	CO3	Study the parasites and control measures
K4	CO4	Study the morphology and anatomy on chordates



Programme code:06	For B.Sc Botany, Chemistry and Biochemistry			
Course code: 19UZO2A2	Allied A Paper 2 Cell biology, Genetics, Embryology, Physiology, Ecology and Evolution			
Batch	Semester	Hour/Week	Total hours	Credit
2019-2020	II	4	75	4

### Course Objective

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 the evolutionary modification.

### Course Outcomes

K1	COI	Get knowledge about the cell and its functions
K2	CO2	Understand the embryology of frog
K3	CO3	Apply the knowledge in the field of nutrition in man and conservation of eco system
K4	CO4	Obtain knowledge of the evolutionary significance of animals

Programme code 06	For B.Sc Botany, Chemistry and Biochemistry			
Course code 19UZO2AL	Allied –A- Practical I Zoology			
Batch 2019-2020	Semester I&II	Hour/Week 2	Total hours 60	Credit 2

### Course Objectives

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

### Course Outcomes

K3	COI	Apply knowledge on identifying non-chordate and chordate
K4	CO2	Analyze the biology and economic importance of non-chordate and chordates
K5	CO3	Evaluate the biological significance of animals

Programme code : 06	Core Paper 1.Basics of beekeeping			
Course code 19UDZA101				
Batch 2019-2020	Semester	Hours/Week 2	Total hours 30	Credit 2

### Course Objectives

1. To identify the different species of honey bees
2. To understand the structure and function of a honey bee hive.
3. To understand the basic biology of honey bees
4. To identify the pest and diseases of honey bees

### Course Outcomes

K1	CO1	Get knowledge and explain the honey bee species and role in agriculture
K2	CO2	Describe biology and structural adaptations of honey bees
K3	CO3	Develop knowledge about honey bee pest and diseases and their control measure.
K4	CO4	Educate the students for the role of honey bees in pollination

Programme code : 06	Core Paper 2. Beekeeping techniques			
Course code 19UDZA202				
Batch 2019-2020	Semester	Hours/Week 2	Total hours 30	Credit 2

### Course Objectives

1. To develop skills about beekeeping management techniques.
2. To educate the students for the importance of beekeeping and honey processing in relation with entrepreneurship development
3. To aware the role of honey bees in pollination
4. To educate the students for value added products in honey

### Course Outcomes

K1	CO1	Get knowledge about basic beekeeping techniques
K2	CO2	Describe parts of bee hive and beekeeping equipments
K3	CO3	Develop knowledge about honey harvest and honey processing methods.
K4	CO4	Educate the students for value added products in honey and role of honey bees in pollination

Programme code 06	Core Practical-1. Beekeeping			
Course code 19UDZA2CL				
Batch 2019-2020	Semester	Hours/Week 2	Total hours 30	Credit 2

### Course Objectives

1. To identify the honey bee species, races and castes
2. To understand the behavior and physiology of honey bees
3. To know the importance of honey bees and hive products
4. To develop knowledge about value added products in honey

### Course outcomes

K1	CO1	Supply knowledge in identifying honey bee species, races and castes
K2	CO2	Analyze the behavior, importance and physiology of honey bees
K3	CO3	Field visit to study the apiary management techniques and honey harvesting methods
K4	CO4	Demonstrate the students for value added products in honey

## **PAPER 1 – Aquarium design, fabrications, and entrepreneurship development**

TotalCredits:5

Total Hours: 75

### **Objectives**

1. To inculcate importance of ornamental fish production in relation with trade for entrepreneurship development.
2. To give students knowledge about various techniques of Design, fabrication and filtration for aquarium maintenance
3. To teach techniques to understand about aquarium setting and accessories involved for construction of aquarium and its maintenance.

### **Course Outcomes**

K1	CO1	Get knowledge about the commercial ornamental fish production of in India
K2	CO2	Understand the practices of ornamental fish culture and its management to export worldwide
K3	CO3	Apply practical knowledge into fish production and marketing to become successful entrepreneur
K4	CO4	Analyze students acquired technical knowledge which is helpful to begin an entrepreneurship in the field of ornamental Fisheries

## **PAPER 2 – Aquarium - Best Management Practices (BMP)**

**TotalCredits:5**

**Total Hours: 75**

### **Objectives**

1. To impart knowledge about the various management practices for successful production of ornamental fishes
2. To teach students about culture of livefeeds, techniques involved to manufacture artificial feed and health management for ornamental fishes.
3. To understand the cost effective ornamental fish production by adoption of Best Management Practices (BMP)

### **Course Outcomes**

K1	COI	Get field knowledge for design and construction of aquarium.
K2	CO2	Understand the formulation of feed and nutrition management for betterment of ornamental fish culture
K3	CO3	Apply knowledge on health management for successful production of aquarium fishes.
K4	CO4	Analyze the breeding and culture techniques for the trading.

### **PAPER 3 – Aquarium (plants, fishes) production and Trade**

**TotalCredits:5**

**Total Hours: 75**

#### **Objectives**

- 1.To impart knowledge on ornamental fish production and trade for develop entrepreneurship for uplift livelihood
2. To inculcate technical knowledge on ornamental fish production and its marketing to make them self sustainable after course.
3. To provide self employment opportunities and knowledge for students.

#### **Course Outcomes**

K1	COI	Get knowledge about the production of ornamental plants and fish species
K2	CO2	Understand the ornamental fish breeding and rearing techniques to generate self employment
K3	CO3	Apply knowledge into the ornamental fishculture field to avoid production risks and enhance production level
K4	CO4	Analyze technical knowledge useful for consultancy, marketing and entrepreneurship development in the field of ornamental fishculture