

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)

M.Sc. ZOOLOGY

For the students admitted

In the

Academic Year 2018-2019

Programme code: 06.		M.Sc., Zoology		
Course Code:18PZO101		Core Paper 1.Animal physiology		
Batch 2018-2019	Semester I	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives

- 1.To get knowledge about the structure and functions of various systems
- 2.To understand the physiology of digestion, respiration, circulation and muscle fibre.
- 3.To study the structure and functions of endocrine glands.

Course Outcomes

K1	CO1	Know the importance of nutrients and digestion
K2	CO2	Understand the physiology of respiration, circulation and muscle
K3	CO3	Impart knowledge on the role of renal organs in excretion
K4	CO4	Describe the endocrine glands and their secretions.

Programme code 06	M.Sc Zoology			
Course code-18PZO102	Core paper 2. Cell and Molecular Biology and Biochemistry			
Batch 2018-2019	Semester I	Hour/Week 5	Total hours 75	Credit 4

Course Objectives

1. To study cell membrane and cyto skeletons structure and functions.
2. To impart knowledge on protein synthesis, cancer and ageing.
3. To inculcate the knowledge on structure and functions of carbohydrate, protein, lipid, free radicals anti-oxidants, nucleic acids.

Course Outcomes

K1	CO1	Get knowledge about cell organelles and their functions.
K2	CO2	understand the various functions adapted inside the cells
K3	CO3	Apply knowledge in molecular and gene sequencing.
K4	CO4	Analyze the protein synthesis aging process. Describe the protein, carbohydrates, lipids. Metabolism and role of enzymes in metabolism.

Programme code :06	M.Sc Zoology			
Course code 18PZO103	Core Paper 3. Biotechnology			
Batch 2018-2019	Semester I	Hour/Week 3	Total hours 45	Credit 5

Course objective

1. To know the students about the Animal Biotechnology, Industrial and Enzyme
2. To learn knowledge on Agricultural, Environmental and Medical Biotechnology
3. To make the students know about the application of medical biotechnology

Course outcomes

K1	CO1	Get knowledge about the cell and tissue culture methods of animals
K2	CO2	Understand the production of monoclonal and polyclonal antibodies and know about the r-DNA technology
K3	CO3	Apply knowledge in production of Biofertilizers, antibodies, hormones and vaccines.
K4	CO4	Understand the importance of microbes and Industrial application

Programme Code : 06	M.Sc, Zoology			
Course code: 18PZO104	Core Paper 4 – Aquaculture			
Batch	Semester	Hour/Week	Total hours	Credit
2018-2019	1	5	75	5

Course Objectives

1. To explore the aquatic resources of the edible and economically important organisms.
2. To make use of the inland waters and marine potential to substitute the protein requirements by the human population.
3. To provide self employment opportunities and knowledge for students.

Course Outcomes

K1	CO1	Get knowledge about the production of cultivable candidate fish species
K2	CO2	Understand the global, national, traditional and modern techniques related to fishes for food security
K3	CO3	Apply practical knowledge into the aquaculture field to enhance production level
K4	CO4	Analyze students theoretical and technical knowledge useful for teaching, research, extension and entrepreneurship in the field of Aquaculture

Programme Code: 06		M.Sc., Zoology		
Course Code: 18PZO205		Core Paper – 5. Biostatistics and Biophysics		
Batch 2018-2019	Semester II	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives

1. Creates awareness on collection, analysis of data and interpretation of results.
2. Students can able to Know the level of significance after analysis of data and also applied in research work.
3. Understand the bioelectric potentials of cell membranes and neurons.

Course Outcomes

K1	CO1	Students get the knowledge about sampling techniques
K2	CO2	Understand the test of significance
K3	CO3	Apply the knowledge in Biophysical methods
K4	CO4	It helps to analyze the Bioinformatics tools of Proteomics, Genomics and Drug designing

Programme code :06		M.Sc., Zoology		
Course Code: 18PZO206		Core Paper 6. Molecular Genetics		
Batch 2018-2019	Semester II	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives

1. To get knowledge about the components of genetic material.
2. To know about genome and their role in inheritance
3. To understand the relation between genes and diseases.

Course Outcomes

K1	CO1	Get knowledge about the structure, organization and functions of genetic materials.
K2	CO2	Understand the expression, regulation and mutation of gene.
K3	CO3	Apply the knowledge on the role of genes in heritability and its measurements
K4	CO4	Analyze the importance of viral oncogenes, regulation of gene expression and signal transduction by oncoproteins.

Programme Code 06	M.Sc Zoology			
Course code: 18PZO207	Core Paper 7. Microbiology and Immunology			
Batch	Semester	Hour/Week	Total hours	Credit
2018-2019	II	6	90	4

Course objective

1. To aware the knowledge of microorganisms in water, soil, sewage and human body and sterilization techniques
2. To observe the importance of microorganisms in agriculture, food processing and medicine.
3. To inculcate the basic knowledge of immunology and disorders in human beings

Course outcomes

K1	COI	Apply the knowledge on microorganisms classification, importance and application
K2	CO2	Observe the role of microorganisms on food processing, environment, microflora on human health and disinfectication methods
K3	CO3	Make awareness on immunity and immune response

Programme Code: 06		M. Sc. Zoology		
Course Code: 18PZO2CL		Core Practical I . Animal Physiology, Biophysics and Molecular Genetics		
Batch 2018-2019	Semester I & II	Hours / Week 4	Total Hours 120	Credits 2

Course Objectives

1. To determine the physiological action in relation to temperature, PH and osmotic pressure.
2. To acquire the practical knowledge about primary metabolites and its estimation in higher organisms.
3. To apply the clinical laboratory techniques and its applications.

Course Outcomes

K1	CO1	Understand the role of primary metabolites.
K2	CO2	Apply the knowledge on the physiological changes in relation to temperature, PH and Osmotic Pressure.
K3	CO3	Analyze the significant role of primary metabolites in higher organisms.
K4	CO4	Evaluate the physiological and biomedical parameters.

Programme Code 06		M.Sc. Zoology		
Course Code: 18PZO2CM		Core Practical II. Biotechnology, Bioinformatics, Biostatistics and Biodiversity		
Batch 2018-2019	Semester I& II	Hours / Week 4	Total Hours 120	Credits 2

Course Objectives

1. To know isolation, separation and purification of Nucleic acids and enzymes
2. To understand about the culture methods of microbes
3. To analyze the data by using varied statistical methods
4. Demonstration of bio informatics tools for nucleotide sequencing
5. To acquire knowledge on the importance of biodiversity and endangered species

Course Outcomes (CO)

K1	CO1	Understand about the isolation, separation and purification of Nucleic acids and enzymes
K2	CO2	Observe the growth of various microbes in culture media
K3	CO3	Analyze the data and interpretation with results
K4	CO4	Apply the information tools for nucleotide sequencing

Programme code -06	M.Sc Zoology			
Course code 18PZO308	Core Paper.8.Entomology			
Batch 2018-2019	Semester III	Hour/Week 5	Total hours 75	Credit 5

Course objectives

1. To know taxonomical position and collection aspects of insects
2. To inculcate knowledge of morphology and physiology of insects
3. To impart knowledge about the growth and metamorphosis in insects

Course outcomes

K1	CO1	Get knowledge about the collection, identification and preservation of insects
K2	CO2	Understand the morphology, structure and chemistry of integument
K3	CO3	Apply knowledge in studying the behavior and physiology of insects
K4	CO4	Analyze the role of endocrine glands and their hormones in insect metamorphosis

Programme Code : 06		M.Sc. Zoology		
Course Code: 18PZO309		Core Paper 9 – Bioinstrumentation		
Batch 2018-2019	Semester III	Hours / Week 5	Total Hours 75	Credits 4

Course Objectives

1. To study the principle and working mechanism of bioinstruments
2. To understand the role of instruments in diagnosing various diseases.
3. To inculcate the hands on training knowledge for the practical purposes

Course Outcomes

K1	CO1	Understand the principles and application of various instruments for biological Science.
K2	CO2	Apply knowledge to know the blotting and polymerase chain reaction analysis.
K3	CO3	Analyze the various biological samples for Histopathological, Haematological and Immunological studies
K4	CO4	Evaluate the application of various instruments

Programme code :06	M.Sc., Zoology			
Course code: 16PZO310	Core Paper 10 -Developmental Biology			
Batch	Semester	Hour/Week	Total hours	Credit
2018-2019	III	5	75	5

Course objectives

- 1.To learn about the developmental stages of an embryo
- 2.To obtain the knowledge of fertilization and differentiation of mammals
- 3.To understand the organogenesis, nutrition , regeneration and teratogenesis of mammals

Course outcomes

K1	CO1	Get knowledge about the spermatogenesis oogenesis and ovulation in human
K2	CO2	Understand the mechanism of fertilization , metabolic activities and molecular changes in cleavage process in human
K3	CO3	Study the development of various organs and physiology of Human
K4	CO4	Study the mechanism of induction, major events during regeneration and teratogenesis

Programme Code : 06		M.Sc Zoology		
Course Code: 18PZO411		Core Paper 11 – Biodiversity and Evolution		
Batch 2018-2019	Semester IV	Hours / Week 5	Total Hours 75	Credits 5

Course Objectives

1. To understand the present status of Fauna and their evolutionary significance.
2. To Create awareness on conservation of Endangered Fauna.
3. To Study the various strategies for minimizing the Global warming

Course Outcomes

K1	CO1	Understand the values of Biodiversity
K2	CO2	Knowledge on IUCN categories
K3	CO3	Apply the methods of calculating Zoological Time Scale
K4	CO4	Analyze the techniques of genetic materials and migration pressure

Programme code -06	M.Sc Zoology			
Course code: 18PZ0412	Core Paper 12 Applied Entomology			
Batch 2018-2019	Semester IV	Hours/Week 6	Total hours 90	Credit 5

Course objectives

1. To acquire information on sericulture, apiculture and insect pests
1. To learn knowledge on disease carrying insects
2. To inculcate knowledge on pest of agriculture, stored grain and their control measures

Course outcomes

K1	CO1	Get knowledge and explain beneficial insects and pests of agriculture and man
K2	CO2	Describe life cycle and benefits of silkworm and honey bees and insect pests of agricultural crops.
K3	CO3	Apply knowledge in the control of insect pests and their management
K4	CO4	Analyze the eco-friendly methods of insect pest control

Programme Code: 06		M.Sc., Zoology		
Course Code: 18PZO4CN		Core Practical III. Environmental Biology and Toxicology		
Batch	Semester	Hours / Week	Total Hours	Credits
2018-2019	III& IV	4	120	2

Course Objectives

1. To observe the quality of the water and soil.
2. To understand the microbial activities and biological analysis of the water.
3. To know the toxicity testing methods and encourage the students to visit the field environment.

Course Outcomes

K3	CO1	Apply knowledge in determining the physical characteristics of the water and soil.
K4	CO2	Analyze the plankton population, microbial quality and the biological analysis of the water.
K5	CO3	Evaluate the toxicity of pollutants on animals and to expose the students in the field study.

Programme Code -06	M.Sc Zoology			
Course Code 18PZO4CO	Core Practical IV. Entomology			
Batch 2018-2019	Semester III&IV	Hour/Week 4	Total Hours 120	Credit 2

Course Objectives

- 1.To observe the types of insects
- 2.To understand the behavior and physiology of insects
- 3.To know the impact of pests on crops
- 4.To know the importance of beneficial insects

Course outcomes

K1	CO1	To apply knowledge in identifying insects of different orders
K2	CO2	To analyze the behavior, importance and physiology of various insects
K3	CO3	To demonstrate the importance of beneficial insects
K4	CO4	To evaluate the effect of pests on crops and man. Field visit to study the biodiversity of insect fauna

Programme Code :06	M.Sc, Zoology			
Course code 18PZO4Z1	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 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

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 the field of zoology.
K4	CO3	Evaluate the research findings and present them in written and oral.
K5	CO4	Implement the research findings for the pollution free environment upliftment of mankind.

Programme Code: 06	M.Sc. Zoology		
	Major Elective Paper 1 – Environmental Biology		
Batch 2018-2019	Hours / Week 4	Total Hours 60	Credits 5

Course Objectives

1. To obtain knowledge about the biosphere and their characteristics.
2. To know the energy, natural resources and their conservations.
3. To get information about the space ecology.

Course Outcomes

K1	CO1	Expertise knowledge about the biosphere.
K2	CO2	Understand the physical, chemical and biological characteristics of the biosphere.
K3	CO3	Apply the knowledge in measuring the energy resources and the conservation of natural resources.
K4	CO4	Analyze the techniques of the remote sensing and space travel.

Programme Code: 06		M.Sc. Zoology		
		Major Elective 2 - Wild Life Ecology and Management		
Batch 2018-2019	Semester	Hours / Week 3	Total Hours 45	Credits 5

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.

K1	COI	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	M.Sc. Zoology		
	Major Elective Paper 3 – Environmental Biology and Toxicology		
Batch 2018-2019	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives

1. To assess the environmental degradation of the biosphere.
2. To create awareness about the environmental quality and monitoring.
3. To obtain the information about toxicants and their impacts in the environment.

Course Outcomes

K1	CO1	Obtain knowledge about the pollutants of the biosphere and their impacts on human beings.
K2	CO2	Understand the effects and control measures of the pollutants.
K3	CO3	Apply the knowledge in monitoring the quality of the environment and to promote bioremediation.
K4	CO4	Analyze and evaluate the toxicity of pollutants on living organisms.

Programme code : 06	M.Sc. Zoology			
	Major Elective Paper 4–Poultry Science and Management			
Batch	Semester	Hour/Week	Total hours	Credit
2018-2019	VI	3	45	5

Course objectives

1. Make the students to develop knowledge on the history and the role of poultry in rural development and its structure.
2. Students can learn the methods of rearing, breeding and production of poultry.
3. 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	Analyze the importance of poultry marketing

Programme code : 06	M.Sc. Zoology		
	Non Major Elective 1- Nutrition and Dietetics		
Batch	Hour/Week	Total hours	Credit
2018-2019	4	60	5

Course objectives

1. To study nutrition for the better health/life.
2. To study nutritional need for different age groups.
3. To create awareness about different Nutrition dietetic organization /industries.

Course outcomes

K1	CO1	Get knowledge on nutrition, dietetics and health to the children, adolescents ,adults and their families.
K2	CO2	Understand the pathophysiology of children, adolescents ,and adults diseases and nutrition modification
K3	CO3	Apply knowledge for the effective strategies to engage population in promotion of nutritional well being
K4	CO4	Analyze the food science knowledge to describe the function in maintaining health.Explain the nutritional knowledge to the public through health organization.

Programme code -06	M.Sc Zoology		
Course code: 18PZO3N2	Non Major Elective 2-Eco tourism		
Batch	Hour/Week	Total hours	Credit
2018-2019	3	60	5

Course Objectives

1. Learn the importance of tourism.
2. Understand the Laws & policies related to tourism.
3. Understand the benefits of tourism.
4. Save the environment through tourism

Course outcomes

K1	CO1	Get knowledge about the tourism industry
K2	CO2	Understand the National and International relationships with tourism
K3	CO3	Apply the knowledge of information technology in the tourism industry
K4	CO4	Analyze the passport and visa formalities

Programme Code: 06	M.Sc Zoology		
	Non Major Elective 3 – Nano- Biotechnology		
Batch	Hours / Week	Total Hours	Credits
2018-2019	4	60	5

Course Objectives

1. To understand the basic knowledge of Nanobiotechnology
2. To enhance the synthesis and application of nano-materials in medicine and agriculture.
3. To apply nano-technological knowledge on the DNA, Proteins, Nucleic acids, drug delivery and biomedicine.

Course Outcomes

K1	CO1	To aware the fundamentals of bio-nano-materials, synthesis and characterizations.
K2	CO2	To understand the applications of bio-nano materials in different field applications like agriculture and medicine.
K3	CO3	To analyze the significance of bio-nano-materials to enhance the treatment of various diseases and enhancement of agriculture through nonmaterial's.
K4	CO4	To apply nano-technological knowledge on environmental and health issues.

Programme code : 06	Major Elective Paper 4 -- Human Genetics and Counselling			
Batch	Semester	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		MSc. Zoology		
Course Code: 18PZOOJ1		Job Oriented Course – Vermitechnology		
Batch 2018-2019	Semester II	Hours / Week 3	Total Hours 45	Credits 2

Course Objectives

1. To provide the fundamental knowledge on Earthworms and its morphological characteristics.
2. To enhance the knowledge on Vermicomposting and their role in sustainable agriculture.
3. To understand the value of Vermitechnology and its significance.

Course Outcomes (CO)

K1	CO1	Get knowledge on the importance of earthworms.
K2	CO2	Understand the Vermicomposting methods in small and large scale
K3	CO3	Analyze the significance of earthworms in sustainable agriculture.
K4	CO4	Apply knowledge on entrepreneurship development of Vermiproducts.

Programme Code : 06	M.Sc, Zoology			
Course code: 18PZOOJ2	JOC - Ornamental Fish culture			
Batch	Semester	Hour/Week	Total hours	Credit
2018-2019	2	3	45	2

Course Objectives

1. To give overview on the potential ornamental fishes and their breeding habits
2. To develop idea about the various management practices for breeding and rearing of ornamental fishes
3. To have a basic understanding of aquarium setting and aquarium accessories involved.

Course Outcomes

K1	CO1	Get knowledge about the production of ornamental 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)

M.Sc. ZOOLOGY

For the students admitted

In the

Academic Year 2019-2020

Programme code: 06.		M.Sc., Zoology		
Course Code:19PZO101		Core Paper 1. Animal physiology		
Batch 2019-2020	Semester I	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives

- 1.To get knowledge about the structure and functions of various systems
- 2.To understand the physiology of digestion, respiration, circulation and muscle fibre.
- 3.To study the structure and functions of endocrine glands.

Course Outcomes

K1	CO1	Know the importance of nutrients and digestion
K2	CO2	Understand the physiology of respiration, circulation and muscle
K3	CO3	Impart knowledge on the role of renal organs in excretion
K4	CO4	Describe the endocrine glands and their secretions.

Programme code 06	M.Sc Zoology			
Course code-19PZO102	Core paper 2. Cell and Molecular Biology			
Batch 2019-2020	Semester I	Hour/Week 5	Total hours 75	Credit 4

Course Objectives

1. To study cell membrane and cyto skeletons structure and functions.
2. To impart knowledge on protein synthesis, cancer and ageing.
3. To inculcate the knowledge on structure and functions of carbohydrate, protein, lipid, free radicals anti-oxidants, nucleic acids.

Course Outcomes

K1	CO1	Get knowledge about cell organelles and their functions.
K2	CO2	understand the various functions adapted inside the cells
K3	CO3	Apply knowledge in molecular and gene sequencing.
K4	CO4	Analyze the protein synthesis aging process. Describe the protein, carbohydrates, lipids. Metabolism and role of enzymes in metabolism.

Programme code :06	M.Sc Zoology			
Course code 19PZO103	Core Paper 3. Biotechnology			
Batch 2019-2020	Semester I	Hour/Week 3	Total hours 45	Credit 5

Course objective

1. To know the students about the Animal Biotechnology, Industrial and Enzyme
2. To learn knowledge on Agricultural, Environmental and Medical Biotechnology
3. To make the students know about the application of medical biotechnology

Course outcomes

K1	CO1	Get knowledge about the cell and tissue culture methods of animals
K2	CO2	Understand the production of monoclonal and polyclonal antibodies and know about the r-DNA technology
K3	CO3	Apply knowledge in production of Biofertilizers, antibodies, hormones and vaccines.
K4	CO4	Understand the importance of microbes and Industrial application

Programme Code : 06	M.Sc, Zoology			
Course code: 19PZO104	Core Paper 4 – Aquaculture			
Batch	Semester	Hour/Week	Total hours	Credit
2019-2020	1	5	75	5

Course Objectives

1. To explore the aquatic resources of the edible and economically important organisms.
2. To make use of the inland waters and marine potential to substitute the protein requirements by the human population.
3. To provide self employment opportunities and knowledge for students.

Course Outcomes

K1	CO1	Get knowledge about the production of cultivable candidate fish species
K2	CO2	Understand the global, national, traditional and modern techniques related to fishes for food security
K3	CO3	Apply practical knowledge into the aquaculture field to enhance production level
K4	CO4	Analyze students theoretical and technical knowledge useful for teaching, research, extension and entrepreneurship in the field of Aquaculture

Programme Code: 06		M.Sc., Zoology		
Course Code: 19PZO205		Core Paper – 5. Biostatistics and Bioinformatics		
Batch 2019-2020	Semester II	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives

1. Creates awareness on collection, analysis of data and interpretation of results.
2. Students can able to Know the level of significance after analysis of data and also applied in research work.
3. Understand the bioelectric potentials of cell membranes and neurons.

Course Outcomes

K1	CO1	Students get the knowledge about sampling techniques
K2	CO2	Understand the test of significance
K3	CO3	Apply the knowledge in Biophysical methods
K4	CO4	It helps to analyze the Bioinformatics tools of Proteomics, Genomics and Drug designing

Programme code :06		M.Sc., Zoology		
Course Code: 19PZO206		Core Paper 6. Molecular Genetics		
Batch 2019-2020	Semester II	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives

1. To get knowledge about the components of genetic material.
2. To know about genome and their role in inheritance
3. To understand the relation between genes and diseases.

Course Outcomes

K1	CO1	Get knowledge about the structure, organization and functions of genetic materials.
K2	CO2	Understand the expression, regulation and mutation of gene.
K3	CO3	Apply the knowledge on the role of genes in heritability and its measurements
K4	CO4	Analyze the importance of viral oncogenes, regulation of gene expression and signal transduction by oncoproteins.

Programme Code 06	M.Sc Zoology			
Course code: 19PZO207	Core Paper 7. Microbiology and Immunology			
Batch	Semester	Hour/Week	Total hours	Credit
2019-2020	II	6	90	4

Course objective

1. To aware the knowledge of microorganisms in water, soil, sewage and human body and sterilization techniques
2. To observe the importance of microorganisms in agriculture, food processing and medicine.
3. To inculcate the basic knowledge of immunology and disorders in human beings

Course outcomes

K1	COI	Apply the knowledge on microorganisms classification, importance and application
K2	CO2	Observe the role of microorganisms on food processing, environment, microflora on human health and disinfection methods
K3	CO3	Make awareness on immunity and immune response

Programme Code: 06		M. Sc. Zoology		
Course Code: 19PZO2CL		Core Practical I . Animal Physiology, Biophysics and Molecular Genetics		
Batch	Semester	Hours / Week	Total Hours	Credits
2019-2020	I & II	4	120	2

Course Objectives

1. To determine the physiological action in relation to temperature, PH and osmotic pressure.
2. To acquire the practical knowledge about primary metabolites and its estimation in higher organisms.
3. To apply the clinical laboratory techniques and its applications.

Course Outcomes

K1	CO1	Understand the role of primary metabolites.
K2	CO2	Apply the knowledge on the physiological changes in relation to temperature, PH and Osmotic Pressure.
K3	CO3	Analyze the significant role of primary metabolites in higher organisms.
K4	CO4	Evaluate the physiological and biomedical parameters.

Programme Code 06		M.Sc. Zoology		
Course Code: 19PZO2CM		Core Practical II. Biotechnology, Bioinformatics, Biostatistics and Biodiversity		
Batch	Semester	Hours / Week	Total Hours	Credits
2019-2020	I& II	4	120	2

Course Objectives

1. To know isolation, separation and purification of Nucleic acids and enzymes
2. To understand about the culture methods of microbes
3. To analyze the data by using varied statistical methods
4. Demonstration of bio informatics tools for nucleotide sequencing
5. To acquire knowledge on the importance of biodiversity and endangered species

Course Outcomes (CO)

K1	CO1	Understand about the isolation, separation and purification of Nucleic acids and enzymes
K2	CO2	Observe the growth of various microbes in culture media
K3	CO3	Analyze the data and interpretation with results
K4	CO4	Apply the information tools for nucleotide sequencing

Programme code -06	M.Sc Zoology			
Course code 19PZO308	Core Paper.8.Entomology			
Batch 2019-2020	Semester III	Hour/Week 5	Total hours 75	Credit 5

Course objectives

1. To know taxonomical position and collection aspects of insects
2. To inculcate knowledge of morphology and physiology of insects
3. To impart knowledge about the growth and metamorphosis in insects

Course outcomes

K1	CO1	Get knowledge about the collection, identification and preservation of insects
K2	CO2	Understand the morphology, structure and chemistry of integument
K3	CO3	Apply knowledge in studying the behavior and physiology of insects
K4	CO4	Analyze the role of endocrine glands and their hormones in insect metamorphosis

Programme Code : 06		M.Sc. Zoology		
Course Code: 19PZO309		Core Paper 9 – Biophysics and Bioinstrumentation		
Batch	Semester	Hours / Week	Total Hours	Credits
2019-2020	III	5	75	4

Course Objectives

1. To study the principle and working mechanism of bioinstruments
2. To understand the role of instruments in diagnosing various diseases.
3. To inculcate the hands on training knowledge for the practical purposes

Course Outcomes

K1	CO1	Understand the principles and application of various instruments for biological Science.
K2	CO2	Apply knowledge to know the blotting and polymerase chain reaction analysis.
K3	CO3	Analyze the various biological samples for Histopathological, Haematological and Immunological studies
K4	CO4	Evaluate the application of various instruments

Programme code :06	M.Sc., Zoology			
Course code: 16PZO310	Core Paper 10 -Developmental Biology			
Batch	Semester	Hour/Week	Total hours	Credit
2019-2020	III	5	75	5

Course objectives

- 1.To learn about the developmental stages of an embryo
- 2.To obtain the knowledge of fertilization and differentiation of mammals
- 3.To understand the organogenesis, nutrition , regeneration and teratogenesis of mammals

Course outcomes

K1	CO1	Get knowledge about the spermatogenesis oogenesis and ovulation in human
K2	CO2	Understand the mechanism of fertilization , metabolic activities and molecular changes in cleavage process in human
K3	CO3	Study the development of various organs and physiology of Human
K4	CO4	Study the mechanism of induction, major events during regeneration and teratogenesis

Programme Code : 06		M.Sc Zoology		
Course Code: 19PZO411		Core Paper 11 – Biodiversity and Evolution		
Batch 2019-2020	Semester IV	Hours / Week 5	Total Hours 75	Credits 5

Course Objectives

1. To understand the present status of Fauna and their evolutionary significance.
2. To Create awareness on conservation of Endangered Fauna.
3. To Study the various strategies for minimizing the Global warming

Course Outcomes

K1	CO1	Understand the values of Biodiversity
K2	CO2	Knowledge on IUCN categories
K3	CO3	Apply the methods of calculating Zoological Time Scale
K4	CO4	Analyze the techniques of genetic materials and migration pressure

Programme code -06	M.Sc Zoology			
Course code: 19PZ0412	Core Paper 12 Applied Entomology			
Batch 2019-2020	Semester IV	Hours/Week 6	Total hours 90	Credit 5

Course objectives

1. To acquire information on sericulture, apiculture and insect pests
3. To learn knowledge on disease carrying insects
4. To inculcate knowledge on pest of agriculture, stored grain and their control measures

Course outcomes

K1	COI	Get knowledge and explain beneficial insects and pests of agriculture and man
K2	CO2	Describe life cycle and benefits of silkworm and honey bees and insect pests of agricultural crops.
K3	CO3	Apply knowledge in the control of insect pests and their management
K4	CO4	Analyze the eco-friendly methods of insect pest control

Programme Code: 06		M.Sc., Zoology		
Course Code: 19PZO4CN		Core Practical III. Environmental Biology and Toxicology		
Batch	Semester	Hours / Week	Total Hours	Credits
2019-2020	III& IV	4	120	2

Course Objectives

1. To observe the quality of the water and soil.
2. To understand the microbial activities and biological analysis of the water.
3. To know the toxicity testing methods and encourage the students to visit the field environment.

Course Outcomes

K3	CO1	Apply knowledge in determining the physical characteristics of the water and soil.
K4	CO2	Analyze the plankton population, microbial quality and the biological analysis of the water.
K5	CO3	Evaluate the toxicity of pollutants on animals and to expose the students in the field study.

Programme Code -06	M.Sc Zoology			
Course Code 19PZO4CO	Core Practical IV. Entomology			
Batch 2019-2020	Semester III&IV	Hour/Week 4	Total Hours 120	Credit 2

Course Objectives

- 1.To observe the types of insects
- 2.To understand the behavior and physiology of insects
- 3.To know the impact of pests on crops
- 4.To know the importance of beneficial insects

Course outcomes

K1	CO1	To apply knowledge in identifying insects of different orders
K2	CO2	To analyze the behavior, importance and physiology of various insects
K3	CO3	To demonstrate the importance of beneficial insects
K4	CO4	To evaluate the effect of pests on crops and man. Field visit to study the biodiversity of insect fauna

Programme Code :06	M.Sc, Zoology			
Course code 19PZO4Z1	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 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

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 the field of zoology.
K4	CO3	Evaluate the research findings and present them in written and oral.
K5	CO4	Implement the research findings for the pollution free environment upliftment of mankind.

Programme Code: 06	M.Sc. Zoology		
	Major Elective Paper 1 – Environmental Biology		
Batch 2019-2020	Hours / Week 4	Total Hours 60	Credits 5

Course Objectives

1. To obtain knowledge about the biosphere and their characteristics.
2. To know the energy, natural resources and their conservations.
3. To get information about the space ecology.

Course Outcomes

K1	CO1	Expertise knowledge about the biosphere.
K2	CO2	Understand the physical, chemical and biological characteristics of the biosphere.
K3	CO3	Apply the knowledge in measuring the energy resources and the conservation of natural resources.
K4	CO4	Analyze the techniques of the remote sensing and space travel.

Programme Code: 06		M.Sc. Zoology		
		Major Elective 2 - Wild Life Ecology and Management		
Batch	Semester	Hours / Week	Total Hours	Credits
2019-2020		3	45	5

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	M.Sc. Zoology		
	Major Elective Paper 3 – Environmental Biology and Toxicology		
Batch 2019-2020	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives

1. To assess the environmental degradation of the biosphere.
2. To create awareness about the environmental quality and monitoring.
3. To obtain the information about toxicants and their impacts in the environment.

Course Outcomes

K1	CO1	Obtain knowledge about the pollutants of the biosphere and their impacts on human beings.
K2	CO2	Understand the effects and control measures of the pollutants.
K3	CO3	Apply the knowledge in monitoring the quality of the environment and to promote bioremediation.
K4	CO4	Analyze and evaluate the toxicity of pollutants on living organisms.

Programme code : 06	M.Sc. Zoology			
	Major Elective Paper 4–Poultry Science and Management			
Batch	Semester	Hour/Week	Total hours	Credit
2019-2020	VI	3	45	5

Course objectives

1. Make the students to develop knowledge on the history and the role of poultry in rural development and its structure.
2. Students can learn the methods of rearing, breeding and production of poultry.
3. Get the knowledge about the preparation of feed antibiotics, vaccines and marketing.

Course Outcomes

K1	COI	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	Analyze the importance of poultry marketing

Programme code : 06	M.Sc. Zoology		
	Non Major Elective 1- Nutrition and Dietetics		
Batch	Hour/Week	Total hours	Credit
2019-2020	4	60	5

Course objectives

1. To study nutrition for the better health/life.
2. To study nutritional need for different age groups.
3. To create awareness about different Nutrition dietetic organization /industries.

Course outcomes

K1	CO1	Get knowledge on nutrition, dietetics and health to the children, adolescents ,adults and their families.
K2	CO2	Understand the pathophysiology of children, adolescents ,and adults diseases and nutrition modification
K3	CO3	Apply knowledge for the effective strategies to engage population in promotion of nutritional well being
K4	CO4	Analyze the food science knowledge to describe the function in maintaining health. Explain the nutritional knowledge to the public through health organization.

Programme code -06	M.Sc Zoology		
Course code: 19PZO3N2	Non Major Elective 2-Eco tourism		
Batch	Hour/Week	Total hours	Credit
2019-2020	3	60	5

Course Objectives

1. Learn the importance of tourism.
2. Understand the Laws& policies related to tourism.
3. Understand the benefits of tourism.
4. Save the environment through tourism

Course outcomes

K1	CO1	Get knowledge about the tourism industry
K2	CO2	Understand the National and International relationships with tourism
K3	CO3	Apply the knowledge of information technology in the tourism industry
K4	CO4	Analyze the passport and visa formalities

Programme Code: 06	M.Sc Zoology		
	Non Major Elective 3 – Nano- Biotechnology		
Batch	Hours / Week	Total Hours	Credits
2019-2020	4	60	5

Course Objectives

1. To understand the basic knowledge of Nanobiotechnology
2. To enhance the synthesis and application of nano-materials in medicine and agriculture.
3. To apply nano-technological knowledge on the DNA, Proteins, Nucleic acids, drug delivery and biomedicine.

Course Outcomes

K1	CO1	To aware the fundamentals of bio-nano-materials, synthesis and characterizations.
K2	CO2	To understand the applications of bio-nano materials in different field applications like agriculture and medicine.
K3	CO3	To analyze the significance of bio-nano-materials to enhance the treatment of various diseases and enhancement of agriculture through nonmaterial's.
K4	CO4	To apply nano-technological knowledge on environmental and health issues.

Programme code : 06	Major Elective Paper 4 -- Human Genetics and Counselling			
Batch	Semester	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. 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		MSc. Zoology		
Course Code: 19PZOOJ1		Job Oriented Course – Vermitechnology		
Batch	Semester	Hours / Week	Total Hours	Credits
2019-2020	II	3	45	2

Course Objectives

1. To provide the fundamental knowledge on Earthworms and its morphological characteristics.
2. To enhance the knowledge on Vermicomposting and their role in sustainable agriculture.
3. To understand the value of Vermitechnology and its significance.

Course Outcomes (CO)

K1	CO1	Get knowledge on the importance of earthworms.
K2	CO2	Understand the Vermicomposting methods in small and large scale
K3	CO3	Analyze the significance of earthworms in sustainable agriculture.
K4	CO4	Apply knowledge on entrepreneurship development of Vermiproducts.

Programme Code : 06	M. Sc, Zoology			
Course code: 19PZOOJ1	JOC – ANIMAL HUSBANDRY			
Batch	Semester	Hour/Week	Total hours	Credit
2019 - 2020	2	3	45	2

COURSE OBJECTIVES

1. To give overview on the common breeds of Livestock and their breeding habits.
2. To develop idea about the various management practices and Veterinary Medicine.
3. To have a basic understanding of Veterinary and Dairy Science.

COURSE OUTCOMES

K1	CO1	Get knowledge about the production of Livestock.
K2	CO2	Understand the Livestock and rearing techniques to generate self employment.
K3	CO3	Apply knowledge into the Livestock production, to avoid production risks and enhance the production level.
K4	CO4	Analyze technical knowledge for consultancy, marketing and entrepreneurship development in the field of Animal husbandry.

Programme code -06	M.Sc Zoology		
Course code: 19PZO0D1	ALC - Eco tourism		
Batch	Hour/Week	Total hours	Credit
2019-2020	3	60	5

Course Objectives

1. Learn the importance of tourism.
2. Understand the Laws& policies related to tourism.
3. Understand the benefits of tourism.
4. Save the environment through tourism

Course outcomes

K1	CO1	Get knowledge about the tourism industry
K2	CO2	Understand the National and International relationships with tourism
K3	CO3	Apply the knowledge of information technology in the tourism industry
K4	CO4	Analyze the passport and visa formalities