SRI VENKATESHWARA

GOVERNMENT ARTS & SCIENCE COLLEGE

PALEM - NAGARKURNOOL (DIST) - 509215.

Accredited by NAAC B+ Grade with 2.54 CGPA.

DEPARTMENTOFZOOLOGY

Programoutcomes,SpecificoutcomesandCourseoutcomes.

2015 - 16

Department of Zoology

Program Outcomes, Program Specific Outcomes and Course Outcomes of B.Sc(BZC) in Zoology

B. Sc (BZC) Zoology Programme

B.Sc. in Zoology is an undergraduate Program in Zoology. Zoology is the branch of science which deals with the study of animal kingdom including the evolution, structure, Physiology, classification, embryology, habits, habitat and distribution of all the animals. The B.Sc. Zoology course is premeditated to introduce students to the study of zoology at the organismal and organ function levels. The theoretical part of the program deals with the general principles of classical as well as modern zoology. The program provides the student with an introduction to the recent advances in zoology in the areas of systematic, evolution, reproduction, development, animal diversity, biochemistry, cytology and animal ecology. This course is offered for candidates who are interested in the study of animals. The minimum time required to complete the course is three years.

Objectives:

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- To make students familiar with animal classification schemes and other applied courses as well as developing an understanding of and ability to apply basic zoological principles.
- To integrate the laboratory and lecture sections of the course and directed toward teaching students both in the classroom and on the field.
- To provide quality education offering skill based programs and motivate the students for self-employment in applied branches of Zoology.
- To inculcate the value based education and entrepreneurial skills among the students.
- To create awareness on environmental issues through various activities.

Programme Outcomes

After successfully completing B. Sc(BZC) Zoology programme students will be able to:

PO1. Communicate scientific information through effective formal and informal methods generally used in sciences.

PO2. Conduct basic scientific research and provide inputs for societal benefits.

PO3. Develop competence in basic sciences and in the content of the specific courses that constitute the principal knowledge of their degree.

PO4. Compare and contrast the characteristics of animals that differentiate them from other forms of life.

PO5. Acquire the skills in handling scientific instruments, planning and performing in laboratory experiments.

PO6. Understand and be aware of relevant theories, paradigms, concepts and principles of zoology.

PO7: Understand the structure and functions of cell types

O8: Acquire time management and self-management skills.

PO9: Relate the various abiotic factors with health of living forms and ecosystems.

PO10: Explain the role of various biomolecules in living systems

PO11: Apply the knowledge of Zoology to understand the complex life Processes and phenomena.

PO12: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning.

Programme Specific Outcomes :

PSO1. Ability to connect and apply biological knowledge to other disciplines and to integrate

PSO2. Explain the origin of life with context to the origin of eukaryotic cell and endosymbiotic theory of origin., fossil records, Darwinism and Neo-Darwinism, experimental evidences.

PSO3. Illustrate zoological science for its application in branches like medical entomology, apiculture, aquaculture and agriculture etc

PSO4. Understand animal interactions with the environment and identify the major groups of organisms with an emphasis on animals and classify them within a phylogenetic framework.

Course Outcomes :

B. Sc. (Zoology) First Year

Paper	Course Outcomes (COs)
Paper 1 **Biology of Invertebrates and Cell biology**	After successfully completing this course, students will be able to: ➢ Understand General characters and classification of Invertebrates From Protozoa to Echinodermataupto order levels with examples ➢ Explain and describe the Type study –Elphidium,Sycon ,Obelia, Schistosoma ,Dracunculus, Hirudinaria granulose, Prawn, Pila ➢ Understand Locomotion and Reproduction in Protozoa. ➢ Explain and describe the Epidemiology of Protozoan diseases - Amoebiasis; Giardiasis; Leishmaniasis and Malaria. ➢ Gain knowledge on General characters and classification of Poriferaupto order levels with examples ➢ Understand the concept of Canal system in sponges and Spicules. ➢ Understand the concept of Polymorphism in Siphonophora

	➢ The student has the basic knowledge on the Corals and coral reef formation ➢ Understand Parasitic Adaptations in Helminthes ➢ Explain and describe the Evolutionary significance of Coelome and Coelomoducts and metamerism ➢ Know various types of Crustacean larvae ➢ Gain knowledge on Insect metamorphosis ➢ Explain and describe the Peripatus -Structure and affinities ➢ The student has the basic knowledge on the Pearl formation ➢ Understand Torsion and detorsion in gastropods ➢ Explain Water vascular system in star fish ➢ Explain and describe the Echinoderm larvae and their significance
B. Sc. (Zoology) Second Year **Paper 2** **Biology of Chordates, Embroyology, Ecology and Zoogeography**	After successfully completing this course,students will be able to: ➢ Explain and describe the General characters ,classification and up to classes with examples of Hemichordata, Urochordata, Cephalochordata, Cyclostomata, Pisces ,Amphibia,Reptilia, Aves, Mammalia ➢ Explain and describe the Anotomy of (Digestive system,respiratotorysystem,circulatotorysystem,nervous system) Scoliodon, Ranatigrina, Calotes, Columba livia, Rabbit. ➢ ExplainBalanoglossus -Structure and affinities ➢ Understand Salient features of Urochordata ➢ Gain knowledge on Retrogressive metamorphosis and its significance in Urochordata ➢ Know Salient features and affinities of Cephalochordata ➢ The students will be able to Compare the Petromyzon and Myxine ➢ Understand different types of Scales and migration in fishes ➢ Understand Parental care in amphibians. ➢ Gain knowledge on Migration in Birds ➢ Gain knowledge on Flight adaptation in Birds ➢ Know Dentition in mammals. ➢ Explain Spermatogenesis, Oogenesis and Fertilization. ➢ Know types of eggs and clevages. ➢ Knowing about development of frog. ➢ Gain types and significance Foetal membranes and Placenta. ➢ Explain regeneration in Turbellarians and results. ➢ Knowing about Bio-geochemical cycles. ➢ Gain Community interactios. ➢ Gain Ecological succession. ➢ Gain knowledge in Population ecology. ➢ To know about Zoogeographical realms and characteristic fauna.

B. Sc. (Zoology) ThirdYear

Paper	Course Outcomes (COs)
Paper 3 **Animal Physiology, Genetics and Evolution**	After successfully completing this course, students will be able to: ➢ Define the basic terms in physiology. ➢ List the various types of digestive enzymes. ➢ Explain the physiological processes in mammals. ➢ Explain the anatomy of various systems. ➢ Illustrate the reproductive cycles with hormonal control. ➢ Daigramatically represent the working of kidney. ➢ Justify the endocrine disorders.
Paper 4 **Applied Zoology**	➢ Explain Mendel's principle, its extension and chromosomal basis and determination of gene action from genotype to phenotype and concepts of inheritance. ➢ Define the terminologies in genetics. ➢ Describe the chromosome anomalies and associated diseases ➢ Know DNA replication. ➢ Gain Lacoperon. ➢ Define organic evolution. ➢ Know about the organic evolution. ➢ Know types of Speciation. After successfully completing this course,studentswilll be able to: ➢ Introduction of Capture fisheries. ➢ To Know types of fisheries. ➢ Know fishing gears and fishing crafts. ➢ Gain various fish culture. ➢ Gain induced Breeding. ➢ Gain Hatchery design and management. ➢ Shrimp and Prawn culture. ➢ To know fish diseases. ➢ Gain Post-harvest technology. ➢ To know Preservation and processing of fishes. ➢ To know Blood composition and blood groups. ➢ Gain blood diseases. ➢ Explain Biopsy and Autopsy. ➢ Explain types of Immunity. ➢ To know various structure of antigens and antibodies. ➢ Gain structure types and properties of Immunoglobulins. ➢ To know types of hypersensitivity. ➢ Gain human blood parasites. ➢ To know human intestinal parasites.

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DEPARTMENT OF ZOOLOGY

Program outcomes, Specific outcomes and Course outcomes.

2016-17

Department of Zoology

Program Outcomes, Program Specific Outcomes and Course Outcomes of B.Sc (BZC) in Zoology

B. Sc (BZC) Zoology Programme

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PSO2. Explain the origin of life with context to the origin of eukaryotic cell and endosymbiotic theory of origin., fossil records, Darwinism and Neo-Darwinism, experimental evidences.

PSO3. Illustrate zoological science for its application in branches like medical entomology, apiculture, aquaculture and agriculture etc

PSO4. Understand animal interactions with the environment and identify the major groups of organisms with an emphasis on animals and classify them within a phylogenetic framework.

Course Outcomes :

B. Sc. (Zoology) First Year

Sem & Paper	Course Outcomes (COs)
Course: Sem I Paper 1 **Animal Diversity – Invertebrates**	After successfully completing this course, students will be able to: ➢ Understand General characters and classification of Invertebrates From Protozoa to Echinodermata upto order levels with examples ➢ Explain and describe the Type study –Elphidium, Sycon ,Obelia, Schistosoma ,Dracunculus, Hirudinaria granulose, Prawn, Pila ➢ Understand Locomotion and Reproduction in Protozoa. ➢ Explain and describe the Epidemiology of Protozoan diseases - Amoebiasis; Giardiasis; Leishmaniasis and Malaria. ➢ Gain knowledge on General characters and classification of Porifera upto order levels with examples ➢ Understand the concept of Canal system in sponges and Spicules. ➢ Understand the concept of Polymorphism in Siphonophora ➢ The student has the basic knowledge on the Corals and coral reef formation ➢ Understand Parasitic Adaptations in Helminthes ➢ Explain and describe the Evolutionary significance of Coelome and Coelomoducts and metamerism ➢ Know various types of Crustacean larvae ➢ Gain knowledge on Insect metamorphosis ➢ Explain and describe the Peripatus -Structure and affinities ➢ The student has the basic knowledge on the Pearl formation ➢ Understand Torsion and detorsion in gastropods ➢ Explain Water vascular system in star fish ➢ Explain and describe the Echinoderm larvae and their significance
Course: Sem II Paper 2 **Animal Diversity- Invertebrates**	After successfully completing this course, students will be able to: ➢ Explain and describe the General characters ,classification and up to classes with examples of Hemichordata, Urochordata, Cephalochordata, Cyclostomata, Pisces ,Amphibia,Reptilia, Aves, Mammalia ➢ Explain and describe the Anotomy of (Digestive system,respiratotory system,circulatotory system,nervous system) Scoliodon, Rana tigrina, Calotes, Columba livia, Rabbit. ➢ Explain Balanoglossus -Structure and affinities ➢ Understand Salient features of Urochordata ➢ Gain knowledge on Retrogressive metamorphosis and its significance in Urochordata ➢ Know Salient features and affinities of Cephalochordata ➢ The students will be able to Compare the Petromyzon and Myxine ➢ Understand different types of Scales and types of Fins in fishes

	➢ Understand Parental care in amphibian; neoteny and paedogenesis ➢ Temporal fosse in reptiles and its evolutionary importance ➢ Compare Distinguished characters of Poisonous and Non poisonous snakes. ➢ Gain knowledge on Migration in Birds ➢ Gain knowledge on Flight adaptation in Birds ➢ Know Dentition in mammals. ➢ Explain Aquatic adaptations in Mammals.

B. Sc. (Zoology) Second Year

Sem & Paper	Course Outcomes (COs)
Course: Sem III Paper 3 **Animal Diversity, Vertebrates and Developmental Biology**	After successfully completing this course, students will be able to: ➢ Define the basic terms in physiology. ➢ List the various types of digestive enzymes. ➢ Explain the physiological processes in mammals. ➢ Explain the anatomy of various systems. ➢ Illustrate the reproductive cycles with hormonal control. ➢ Daigramatically represent the working of kidney. ➢ Justify the endocrine disorders. ➢ Types of Behavior:-Taxes, Reflexes, Tropisms, Instinctive and Motivated behavior. ➢ Physiology and phylogeny of learning:-Imprinting, habituation, ➢ Classical conditioning, Instrumental conditioning and trial and error ,learning. ➢ Social behavior, Communication, Pheromones ➢ Biological rhythms:-Types. ➢ Familiar with various stages involved in the developing embryo ➢ Apply the knowledge to collect various Biological data ➢ Understand the initial development al procedures involved in Amphioxus, frog and chick ➢ Familiar with types of placentaAbility to explain various Prenatal Diagnosis ➢ Familiarise with the principle of developmental biology ➢ Familiarise with various Techniques and tools of Embryology
Course: Sem IV Paper 4 **Cell Biology, Genetics and**	After successfully completing this course, students will be able to: ➢ Differentiate prokaryotic and Eukaryotic cells.

Evolution.	➢ Explain the principles of staining. ➢ Describe the structure and functions of cell organelles. ➢ Label the various cell parts and Cell organelles. ➢ Explain the cell division process and its significance. ➢ Explain Mendel's principle, its extension and chromosomal basis and determination of gene action from genotype to phenotype and concepts of inheritance. ➢ Define the terminologies in genetics. ➢ Describe the chromosome anomalies and associated diseases ➢ After successfully completing this course, students will be able to: ➢ Define organic evolution. ➢ Explain the theories of organic evolution. ➢ Describe the concept of origin of life and theories of origin of life. ➢ Struggle for existence; variation; and inheritance. ➢ Describe evolution of man. ➢ Illustrate the presence of organisms at various geological time scale. ➢ Apply the knowledge in relevant experimentations. ➢ Categorize different zoogeographical realms. ➢ Compare animal distribution in different zoogeographical realms.

B. Sc. (Zoology) Third Year

Sem & Paper	Course Outcomes (COs)
Course: Sem V Paper 5 **Physiology and Bio Chemistry (DSC-I)**	After successfully completing this course, students will be able to: ➢ Define the basic terms in biochemistry. ➢ Explain the structure, functions and reactions of the various biomolecules. ➢ Give examples of each group type of biomolecules. ➢ Correlate the changes in the levels of these biomolecules with the diseases in human ➢ Calculate pH and pOH of buffer solution. ➢ Classify the biomolecules. ➢ Knowing about the human metabolic activities.
Course: Sem V Paper 6 **Entomology(DSE-I)**	After successfully completing this course,students will be able to: ➢ Introduction to Insects ,General Features of Insects, Morphological features, Head – Eyes, Types of antennae, Mouth parts w.r.t.feeding habits. ➢ Brief introduction of Carrier and Vectors (mechanical and biological vector), Reservoirs, Host-vector relationship, Vectorial capacity, Adaptations as vectors, Host Specificity. ➢ Classification of insects up to orders, detailed features of orders with insects as vectors – Diptera, Siphonaptera, Siphunculata,

	Hemiptera. ➢ Describe the Dipterans as important insect vectors – Mosquitoes, Sand fly, Houseflies; Study of mosquito-borne diseases – Malaria, Dengue, Chikungunya, Viral encephalitis, Filariasis;Control of mosquitoes. ➢ Describe the Study of sand fly-borne diseases – Visceral Leishmaniasis, Cutaneous Leishmaniasis, Phlebotomus fever; Control of Sand fly. ➢ Study of house fly as important mechanical vector, Myiasis, Control of house fly. ➢ Fleas as important insect vectors; Host-specificity, Study of Flea-borne diseases – Plague, Typhus fever; Control of fleas. ➢ Describe the Human louse (Head, Body and Pubic louse) as important insect vectors; Study of louse-borne diseases –Typhus fever, Relapsing fever, Trench fever, Vagabond's disease, Phthiriasis; Control of human louse. ➢ Describe the Bugs as insect vectors; Blood-sucking bugs; Chagas disease, Bed bugs as mechanical vectors, Control and prevention measures.
Course: Sem VI Paper 7 **Imunology and Animal Bio-Technology (DSC-II)** **Course: Sem VI Paper 8** **Acquatic Biology (DSE-II)**	After successfully completing this course, students will be able to: ➢ List the primary and secondary immune organs. ➢ Explain the concepts of immunity, self-non-self immunne response, autoimmune disease. ➢ Explain the Innate and Acquired Immunity. ➢ Knowing about Hyper sensitivity. ➢ Knowing about various types of Immuno globlins. ➢ Explain the types of vaccines. ➢ Knowing about different structure of Antigens and Antibodies. ➢ Explain the recombinant DNA technology. ➢ Explain the applications of Bio-Technology. ➢ Knowing about Transgenic animals. After successfully completing this course,students will be able to: ➢ Explain the types of cloning and vectors. ➢ Identify the fish diseases and the causative organisms. ➢ Mention the various composite fish culture with significance of each type. ➢ Describe the methods of freshwater prawn culture and its management.

	➢ Explain the methods of pearl culture and pearl harvesting. ➢ Illustrate the preparation and management of fish culture ponds. ➢ Demonstrate the methods of packaging and transport of fish and brood fish. ➢ Illustrate techniques of fish harvesting, preservation & processing. ➢ Compare the techniques used in fishery development ➢ List the environmental challenges and their remedies. ➢ Describe the nature of ecosystem, productivity, food webs, energy flow, ➢ Describe the resilience of ecosystem and ecosystem management. ➢ Explain Biosphere, biomes and impact of climate on biomes. ➢ Explain wildlife management in India and conservation of wildlife. ➢ Explain the three necessary and sufficient conditions i.e ➢ Illustrate the toxic effects of chemicals in the environment on human and his livestock. ➢ Discuss natural resources, causes of their depletion and their conservation.

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Program outcomes, Specific outcomes and Course outcomes.

2019-20

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Course Outcomes :

B. Sc. (Zoology) First Year

Sem & Paper	Course Outcomes (COs)

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Course: Sem V Paper 5 **Physiology and Bio Chemistry (DSC-I)**	After successfully completing this course, students will be able to: ➢ Define the basic terms in biochemistry. ➢ Explain the structure, functions and reactions of the various biomolecules. ➢ Give examples of each group type of biomolecules. ➢ Correlate the changes in the levels of these biomolecules with the diseases in human ➢ Calculate pH and pOH of buffer solution. ➢ Classify the biomolecules. ➢ Knowing about the human metabolic activities.
Course: Sem V Paper 6 **Entomology(DSE-I)**	After Successfully Completing this course,Students Will be able to: ➢ Introduction to Insects ,General Features of Insects, Morphological features, Head – Eyes, Types of antennae, Mouth parts w.r.t.feeding habits. ➢ Brief introduction of Carrier and Vectors (mechanical and biological vector), Reservoirs, Host-vector relationship, Vectorial capacity, Adaptations as vectors, Host Specificity. ➢ Classification of insects up to orders, detailed features of orders with insects as vectors – Diptera, Siphonaptera, Siphunculata, Hemiptera. ➢ Describe the Dipterans as important insect vectors – Mosquitoes,

	Sand fly, Houseflies; Study of mosquito-borne diseases – Malaria, Dengue, Chikungunya, Viral encephalitis, Filariasis;Control of mosquitoes. ➢ Describe the Study of sand fly-borne diseases – Visceral Leishmaniasis, Cutaneous Leishmaniasis, Phlebotomus fever; Control of Sand fly. ➢ Study of house fly as important mechanical vector, Myiasis, Control of house fly. ➢ Fleas as important insect vectors; Host-specificity, Study of Flea-borne diseases – Plague, Typhus fever; Control of fleas. ➢ Describe the Human louse (Head, Body and Pubic louse) as important insect vectors; Study of louse-borne diseases –Typhus fever, Relapsing fever, Trench fever, Vagabond's disease, Phthiriasis; Control of human louse. ➢ Describe the Bugs as insect vectors; Blood-sucking bugs; Chagas disease, Bed bugs as mechanical vectors, Control and prevention measures.
Course: Sem VI Paper 7 **Imunology and Animal Bio-Technology (DSC-II)** **Course: Sem VI Paper 8** **Acquatic Biology (DSE-II)**	After successfully completing this course, students will be able to: ➢ List the primary and secondary immune organs. ➢ Explain the concepts of immunity, self-non-self immunne response, autoimmune disease. ➢ Explain the Innate and Acquired Immunity. ➢ Knowing about Hyper sensitivity. ➢ Knowing about various types of Immuno globlins. ➢ Explain the types of vaccines. ➢ Knowing about different structure of Antigens and Antibodies. ➢ Explain the recombinant DNA technology. ➢ Explain the applications of Bio-Technology. ➢ Knowing about Transgenic animals. After Successfully Completing this course,Students Will be able to: ➢ Explain the types of cloning and vectors. ➢ Identify the fish diseases and the causative organisms. ➢ Mention the various composite fish culture with significance of each type. ➢ Describe the methods of freshwater prawn culture and its management. ➢ Explain the methods of pearl culture and pearl harvesting. ➢ Illustrate the preparation and management of fish culture

	ponds. ➢ Demonstrate the methods of packaging and transport of fish and brood fish. ➢ Illustrate techniques of fish harvesting, preservation & processing. ➢ Compare the techniques used in fishery development ➢ List the environmental challenges and their remedies. ➢ Describe the nature of ecosystem, productivity, food webs, energy flow, ➢ Describe the resilience of ecosystem and ecosystem management. ➢ Explain Biosphere, biomes and impact of climate on biomes. ➢ Explain wildlife management in India and conservation of wildlife. ➢ Explain the three necessary and sufficient conditions i.e ➢ Illustrate the toxic effects of chemicals in the environment on human and his livestock. ➢ Discuss natural resources, causes of their depletion and their conservation.