

**GOVERNMENT DEGREE AND PG COLLEGE::PUTTUR**

**ZOOLOGY DEPARTMENT**

<b>SEM 1 PAPER 1</b>	
<b>Title of the paper</b>	<b>ANIMAL DIVERSITY OF INVERTBRATES</b>
<b>Credits</b>	<b>3 (Theory) + 2 (Practicals)</b>
<b>Total Hours</b>	<b>60+24</b>

In this course the students

**CO1.** Know the General characters and classification of Invertebrate phyla and Hemichordata

**CO2.** Understand the type studies of Elphidium, Sycon, Fasciola hepatica, Leech, Prawn.

**CO3.** Explain canal system in Sponges, corals and coral reef formation, Polymorphism in Coelenterates.

**CO4.** Understand Vermiculture and vermi compost, Pearl formation in Pelecypoda, water vascular system in star fish.

**CO5.** Learn about various invertebrate larval forms.

<b>SEM II PAPER II</b>	
<b>Title of the paper</b>	<b>ANIMAL DIVERSITY -CHORDATES</b>
<b>Credits</b>	<b>3 (Theory) + 2 (Practicals)</b>
<b>Total Hours</b>	<b>60+24</b>

**This course enables the students to understand**

CO1. Distinct features and classification of Chordates, Origin of Chordates.

CO2. General characters and classification of Protochordates, Cyclostomes, Fishes, Amphibia, Reptelia, Aves and Mammalia.

CO3. The structure and Life history of Herdmania (Retrogressive Metamorphosis).

CO4. Thetypes of scales in fishes, Migration of fishes, Flight adaptations in Birds, Bird Migration, Dentition in Mammals.

CO5. Geographical features and faunal distribution of Oriental, Australian and Ethiopian regions.

<b>SEM III PAPER III</b>	
<b>Title of the paper</b>	<b>CYTOLOGY, GENETICS AND EVOLUTION</b>
<b>Credits</b>	<b>3 (Theory) + 2 (Practicals)</b>
<b>Total Hours</b>	<b>60+24</b>

This paper enables the students to understand

CO1. Prokaryotic and eukaryotic cells, virus , viroids, Mycoplasma, Electron microscopic structure of eukaryotic cell, Plasma Membrane

CO2. Structure and functions of Endoplasmic Reticulum, Golgi complex, Ribosomes, Lysosomes, Mitochondria, Nucleus, Chromosomes.

CO3. Mendel's work on transmission of traits, Principles of inheritance, Incomplete dominance and co-dominance, Lethal alleles, Epistasis, Pleiotropy

CO4. Sex Determination, Sex Linked inheritance, Linkage and crossing over, Extra chromosomal inheritance, Human Karyotyping.

CO5. Origin of life, Lamarckism, Darwinism, Neo-Darwinism, Hardy-Weinberg Equilibrium, Variations, isolating mechanisms, natural selection, Speciation (Allopatric and Sympatric), Macro evolutionary principles.

<b>SEM IV PAPER IV</b>	
<b>Title of the paper</b>	<b>EMBRYOLOGY,PHYSIOLOGY,ECOLOGY,ANIMAL</b>
	<b>BEHAVIOUR</b>
<b>Credits</b>	<b>3 (Theory) + 2 (Practicals)</b>
<b>Total Hours</b>	<b>60+24</b>

**This course enables the students to understand**

CO1. Gametogenesis, Fertilization, Types of eggs, Development of Frog upto gastrulation, Foetal membranes and Placentation in Mammals.

CO2. The Physiology of Digestion, Respiration, Circulation, Excretion, Muscle contraction, Nerve impulse, Endocrine glands.

CO3. Meaning and Scope of Ecology, Biotic and Abiotic Factors, Pond Ecosystem, Food chain, Energy flow, Biogeochemical cycles, Ecological Succession, Community Interactions.

CO4. Animal behaviour definition and Types, Innate behaviour, Learned behaviour (Associate learning).

CO5. Learning and Memory, Biological clocks, Circadian rhythms.

<b>SEM V PAPER V</b>	
<b>Title of the paper</b>	<b>ANIMAL BIOTECHNOLOGY</b>
<b>Credits</b>	<b>3 (Theory) + 2 (Practicals)</b>
<b>Total Hours</b>	<b>60+24</b>

**This course enables the students to understand**

CO1. Tools of Recombinant DNA technology

CO2. Techniques of Recombinant DNA technology

CO3 .Animal Cell Technology

CO4. Reproductive Technologies & Transgenic Animals

CO5. Different types of Fermentation, Downstream processing - Filtration, centrifugation, extraction, chromatography, spray drying and lyophilization.

<b>SEM V PAPER VI</b>	
<b>Title of the paper</b>	<b>ANIMAL HUSBANDRY</b>
<b>Credits</b>	<b>3 (Theory) + 2 (Practicals)</b>
<b>Total Hours</b>	<b>60+24</b>

**This course enables the students to understand**

CO1. Poultry farming, Management of chicks, growers and layers, Broilers.

CO2. Principles of feeding, Poultry diseases – viral, bacterial, fungal and parasitic

CO3. Selection, care and handling of hatching eggs

CO4. Classification of Indian Cattle breeds, exotic breeds and Indian buffalo breeds. Systems of inbreeding and crossbreeding, Housing of dairy animals, Cleaning and sanitation of dairy farm. Weaning of calf, Castration and dehorning, Deworming and Vaccination programme, Records to be maintained in a dairy farm.

CO5. Care and management of calf, heifer, milk animal, dry and pregnant animal, bulls and bullocks.

<b>SEM VI PAPER VII</b>	
<b>Title of the paper</b>	<b>IMMUNOLOGY</b>
<b>Credits</b>	<b>3 (Theory) + 2 (Practicals)</b>
<b>Total Hours</b>	<b>60+24</b>

**This course enables the students to understand**

CO1 .Basic concepts in Immunology, Innate and adaptive immunity, Cells and organs of Immune system

CO2. Basic properties of antigens,B and T cell epitopes, haptens and adjuvants, Factors influencing immunogenicity.

CO3. Structure of antibody, Classes and functions of antibodies , Monoclonal antibodies.

CO4. Structure and functions of major histocompatibility complexes, Exogenes and

### CLUSTER ELECTIVE: AQUACULTURE

SEM VI PAPER VII <sup>IA</sup>	
<b>Title of the paper</b>	<b>PRINCIPLES OF AQUACULTURE</b>
<b>Credits</b>	<b>3 (Theory) + 2 (Practicals)</b>
<b>Total Hours</b>	<b>60+24</b>

Endogenes pathways of antigen presentation and processing.

CO5. Classification and brief description of various types of hyper sensitivities, Vaccines, Types of vaccines.

#### **This paper enables the students to understand**

CO1. Definition, Significance and History of Aquaculture , Present status of Aquaculture – Global and National scenario, Major cultivable species for aquaculture: freshwater, brackish water and marine.

CO2. Types of Aquaculture: Culture systems: Culture practices

CO3. Criteria for the selection of site for fresh water and brackish water pond farms, Design and construction of fish and shrimp farms, Natural seed resources and Procurement of seed for stocking, Nutritional requirements of cultivable fish and shellfish.

CO4. Management of carp culture ponds, Culture of giant freshwater prawn, Macrobrachium rosenbergii.

CO5. Culture of shrimp, Seaweeds, Ornamental fishes.

SEM VI PAPER VII <sup>B</sup>	
<b>Title of the paper</b>	<b>AQUACULTURE MANAGEMENT</b>
<b>Credits</b>	<b>3 (Theory) + 2 (Practicals)</b>
<b>Total Hours</b>	<b>60+24</b>

#### **This paper enables the students to understand**

CO1. Bundh Breeding and Induced breeding of carp by Hypophysation; and use of synthetic hormones, Types of fish hatcheries; Hatchery management of Indian major carps

CO2. Water quality and soil characteristics suitable for fish and shrimp culture

CO3. Live Foods and their role in shrimp larval nutrition, Supplementary feeds

CO4. Principles of disease diagnosis and health management

CO5. Principles of aquaculture economics, Fisheries Training and Education in India.

<b>SEM VI PAPER VIIC</b>	
<b>Title of the paper</b>	<b>POST HARVEST TECHNOLOGY</b>
<b>Credits</b>	<b>3 (Theory) + 2 (Practicals)</b>
<b>Total Hours</b>	<b>60+24</b>

This paper enables the students to understand

CO1. Handling of fresh fish, storage and transport of fresh fish, post mortem changes, spoilage in marine fish and freshwater fish, Principles of preservation.

CO2. Methods of fish Preservation

CO3. Various Fish Products and by-products, Seaweed Products and their uses.

CO4. Sanitation in processing plants - Environmental hygiene and Personal hygiene in processing plants.

CO5. Seafood Quality Assurance and Systems