

VISVODAYA GOVERNMENT DEGREE COLLEGE, VENKATAGIRI

PROGRAMME OUTCOMES-ZOOLOGY

PROGRAMME: THREE-YEAR B.Sc. (With Chemistry, Botany and Zoology Disciplines)

Program Outcomes (POs): The Learning Outcomes of the programme could be in consonance with the Bloom's Taxonomy, which includes

1. Remember (Lower order)
2. Understand (Lower Order)
3. Apply (Lower Order)
4. Analyze (Higher Order)
5. Evaluate & Problem Solving (Higher Order)
6. Create (Higher Order)

PO1-Critical thinking

- ❖ Able to understand and utilize the principles of scientific enquiry, think analytically, clearly and evaluate critically while solving problems and making decisions during biological study.

PO2-Effective communication

- ❖ Able to formally communicate Scientific ideas and investigations of the biology discipline to others using both oral and written communication skills.

PO3-Social interaction

- ❖ Able to develop individual behaviour and influence society and social structure.

PO4-Effective citizenship

- ❖ Able to work with a sense of responsibility towards social awareness and follow the ethical standards in the society.

PO5-Ethics

- ❖ Ability to demonstrate and discuss ethical conduct in scientific activities.

PO6-Environment and Sustainability

- ❖ Able to understand the impact of biological science in societal and environmental contexts and demonstrate the knowledge for sustainable development.

PO7-Self-directed and life-long learning

- ❖ Able to recognize the need of life-long learning and engage in research and self-education.

ZOOLOGY – SEMESTER I, PAPER – I

ANIMAL DIVERSITY – BIOLOGY OF NONCHORDATES

THEORY

Course Outcomes

By the completion of the course the graduate should able to

- ❖ CO1- Describe general taxonomic rules on animal classification
- ❖ CO2- Classify Protozoa to Coelenterata with taxonomic keys
- ❖ CO3 -Classify Phylum Platy hemminthes to Annelida phylum using examples from parasitic adaptation and vermin composting
- ❖ CO4- Describe Phylum Arthropoda to Mollusca using examples and importance of insects and Molluscans
- ❖ CO5- Describe Echinodermata to Hemi chordata with suitable examples and larval stages in relation to the phylogeny

Learning objectives

- To understand the taxonomic position of protozoa to helminthes.
- 2. To understand the general characteristics of animals belonging to protozoa to hemichordata.
- 3. To understand the structural organization of animals phylum from protozoa to hemichordata.
- 4. To understand the origin and evolutionary relationship of different phyla from protozoa to hemichordata.
- 5. To understand the origin and evolutionary relationship of different phylum from annelids to hemichordates.

ANIMAL DIVERSITY – BIOLOGY OF NONCHORDATES

PRACTICAL

Learning Outcomes

- To understand the importance of preservation of museum specimens
- To identify animals based on special identifying characters
- To understand different organ systems through demo or virtual dissections
- To maintain a neat, labelled record of identified museum specimen

AP STATE COUNCIL OF HIGHER EDUCATION w.e.f. 2020-21 (Revised in April, 2020)

ZOOLOGY –SEMESTER II, PAPER – II

ANIMAL DIVERSITY – BIOLOGY OF CHORDATES

THEORY

Course Outcomes

By the completion of the course the graduate should able to

- ❖ CO1- Describe general taxonomic rules on animal classification of chordates
- ❖ CO2- Classify Protochordata to Mammalia with taxonomic keys
- ❖ CO3- Understand Mammals with specific structural adaptations
- ❖ CO4- Understand the significance of dentition and evolutionary significance
- ❖ CO5- Understand the origin and evolutionary relationship of different phyla from Prochordata to mammalia.

Learning objectives

- To understand the animal kingdom .
- To understand the taxonomic position of Protochordata to Mammalia.
- To understand the general characteristics of animals belonging to Fishes to Reptilians.
- To understand the body organization of Chordata.
- To understand the taxonomic position of Protherian mammals.

ANIMAL DIVERSITY – BIOLOGY OF CHORDATES

PRACTICAL

Learning Outcomes

- ❖ To understand the taxidermic and other methods of preservation of chordates To identify chordates based on special identifying characters
- ❖ To understand internal anatomy of animals through demo or virtual dissections, thus directing the student for “empathy towards the fellow living beings”
- ❖ To maintain a neat, labeled record of identified museum specimens

ZOOLOGY – SEMESTER III,PAPER – III

CELL BIOLOGY, GENETICS, MOLECULAR BIOLOGY AND EVOLUTION

Course Outcomes

The overall course outcome is that the student shall develop deeper understanding of what life is and how it functions at cellular level. This course will provide students with a deep knowledge in Cell Biology, Animal Biotechnology and Evolution and by the completion of the course the graduate shall able to

- CO1- To understand the basic unit of the living organisms and to differentiate the organisms by their cell structure.
- CO2 -Describe fine structure and function of plasma membrane and different cell organelles of eukaryotic cell.
- CO3- To understand the history of origin of branch of genetics, gain knowledge on heredity, interaction of genes, various types of inheritance patterns existing in animals
- CO4- Acquiring in-depth knowledge on various of aspects of genetics involved in sex determination, human karyotyping and mutations of chromosomes resulting in various disorders
- CO5- Understand the central dogma of molecular biology and flow of genetic information from DNA to proteins.
- CO6- Understand the principles and forces of evolution of life on earth, the process of evolution of new species and apply the same to develop new and advanced varieties of animals for the benefit of the society

Learning Objectives

- To understand the origin of cell and distinguish between prokaryotic and eukaryotic cell
- To understand the role of different cell organelles in maintenance of life activities
- To provide the history and basic concepts of heredity, variations and gene interaction □ To enable the students distinguish between polygenic, sex-linked, and multiple allelic modes of inheritance.
- To acquaint student with basic concepts of molecular biology as to how characters are expressed with a coordinated functioning of replication, transcription and translation in all living beings
- To provide knowledge on origin of life, theories and forces of evolution
- To understand the role of variations and mutations in evolution of organisms

ZOOLOGY – SEMESTER III,PAPER – III

CELL BIOLOGY, GENETICS, MOLECULAR BIOLOGY AND EVOLUTION

PRACTICAL

Learning Objectives

- Acquainting and skill enhancement in the usage of laboratory microscope
- Hands-on experience of different phases of cell division by experimentation
- Develop skills on human karyotyping and identification of chromosomal disorders
- To apply the basic concept of inheritance for applied research
- To get familiar with phylogeny ad geological history of origin & evolution of animals

ZOOLOGY – SEMESTER IV, PAPER – IV

ANIMAL PHYSIOLOGY, CELLULAR METABOLISM AND EMBRYOLOGY

Course Outcomes

This course will provide students with a deep knowledge in Physiology, Cellular metabolism and Molecular Biology and by the completion of the course the graduate shall able to

- CO1- Understand the functions of important animal physiological systems including digestion, cardio-respiratory and renal systems.
- CO2- Understand the muscular system and the neuro-endocrine regulation of animal growth, development and metabolism with a special knowledge of hormonal control of human reproduction.
- CO3- Describe the structure, classification and chemistry of biomolecules and enzymes responsible for sustenance of life in living organisms
- CO4- Develop broadunderstanding the basic metabolic activities pertaining to the catabolism and anabolism of various biomolecules
- CO5- Describe the key events in early embryonic development starting from the formation of gametes upto gastrulation and formation of primary germ layers.

Learning Objectives

- To achieve a thorough understanding of various aspects of physiological systems and their functioning in animals.
- To instil the concept of hormonal regulation of physiology, metabolism and reproduction in animals.
- To understand the disorders associated with the deficiency of hormones
- To demonstrate a thorough knowledge of the intersection between the disciplines of Biology and Chemistry.
- To provide insightful knowledge on the structure and classification of carbohydrates, proteins, lipids and enzymes
- To demonstrate an understanding of fundamental biochemical principles such as the function of biomolecules, metabolic pathways and the regulation of biochemical processes
- To make students gain proficiency in laboratory techniques in biochemistry and orient them to apply the scientific method to the processes of

ANIMAL PHYSIOLOGY, CELLULAR METABOLISM AND EMBRYOLOGY

PRACTICAL

Learning Objectives

- Identification of an organ system with histological structure
- Deducing human health based on the information of composition of blood cells
- Demonstration of enzyme activity in vitro
- Identification of various biomolecules of tissues by simple colorimetric methods and also quantitative methods
- Identification of different stages of early embryonic development in animals

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ZOOLOGY – SEMESTER IV,

COURSE - 5 IMMUNOLOGY AND ANIMAL BIOTECHNOLOGY

Course Outcomes

This course will provide students with a deep knowledge in immunology, genetics, embryology and ecology and by the completion of the course the graduate shall be able to

- ❖ CO1- To get knowledge of the organs of Immune system, types of immunity, cells and organs of immunity.
- ❖ CO2- To describe immunological response as to how it is triggered (antigens) and regulated (antibodies)
- ❖ CO3- Understand the applications of Biotechnology in the fields of industry and agriculture including animal cell/tissue culture, stem cell technology and genetic engineering.
- ❖ CO4- Get familiar with the tools and techniques of animal biotechnology.

Learning Objectives

- To trace the history and development of immunology
- To provide students with a foundation in immunological processes
- To be able to compare and contrast the innate versus adaptive immune systems and humoral versus cell-mediated immune responses
- Understand the significance of the Major Histocompatibility Complex in terms of immune response and transplantation
- To provide knowledge on animal cell and tissue culture and their preservation

- To empower students with latest biotechnology techniques like stem cell technology, genetic engineering, hybridoma technology, transgenic technology and their application in medicine and industry for the benefit of living organisms
- To explain in vitro fertilization, embryo transfer technology and other reproduction manipulation methodologies.
- To get insight in applications of recombinant DNA technology in agriculture, production of therapeutic proteins.
- To understand principles of animal culture, media preparation.

ZOOLOGY PRACTICAL SYLLABUS FOR V SEMESTER
COURSE – 5: IMMUNOLOGY AND ANIMAL BIOTECHNOLOGY

Learning Objectives

- ❖ Acquainting student with immunological techniques vis-à-vis theory taught in the class room
- ❖ Interconnect the theoretical and practical knowledge of immunity with the outer world for the development of a healthier life.
- ❖ Demonstrate basic laboratory skills necessary for Biotechnology research
- ❖ Promoting application of the lab techniques for taking up research in higher studies

REVISED UG SYLLABUS UNDER CBCS (Implemented from Academic Year - 2020-21)

Course6 A: SUSTAINABLE AQUACULTURE MANAGEMENT

(Skill Enhancement Course (Elective), -Credits: 05)

Learning Outcomes

Students at the successful completion of this course will be able to

- ❖ **Evaluate the present status of aquaculture at the Global level and National level**
- ❖ **Classify different types of ponds used in aquaculture**
- ❖ **Demonstrate induced breeding of carps**
- ❖ **Acquire critical knowledge on commercial importance of shrimps**
- ❖ **Identify fin and shell fish diseases**

Course 6 A: SUSTAINABLE AQUACULTURE MANAGEMENT

PRACTICAL SYLLABUS

Learning Outcomes

On successful completion of this practical course, student shall be able to

- **Identify the characters of Fresh water cultivable species**
- **Estimate physico chemical characteristics of water used for aquaculture**
- **Examine the diseases of fin and shell fish**
- **Suggest measures to prevent diseases in aquaculture**

REVISED UG SYLLABUS UNDER CBCS (Implemented from Academic Year - 2020-21)

Course 7 A: POSTHARVEST TECHNOLOGY OF FISH AND FISHERIES

(Skill Enhancement Course (Elective), - Credits: 05)

Learning Outcomes

Students at the successful completion of this course will be able to

- ❖ Identify the types of preservation methods employed in aquaculture**
- ❖ Choose the suitable Processing methods in aquaculture**
- ❖ Maintain the standard quality control protocols laid down in aqua industry**
- ❖ Identify the best Seafood quality assurance system**

REVISED UG SYLLABUS UNDER CBCS (Implemented from Academic Year - 2020-21)

Course 7 A: POSTHARVEST TECHNOLOGY OF FISH AND FISHERIES

PRACICAL SYLLABUS

Learning Outcomes

On successful completion of this practical course, student shall be able to

- ❖ Identify the quality of aqua processed products.**
- ❖ Determine the quality of fishery by products by observation**
- ❖ Analyze the protocols of aqua processing methods**