



**A.S.D. Government Degree College for Women**

**An Autonomous Institution**

**Jagannaickpur, Kakinada, Andhra Pradesh-533002**

**Affiliated to Adikavi Nannaya University, Rajamahendravaram**



## **INTERNAL QUALITY ASSURANCE CELL**

2.6.1. The institution has stated learning outcomes (programme and course outcome)/graduate attributes which are integrated into the assessment process and widely publicized through the website and other documents and the attainment of the same are evaluated by the institution.

శ్రీ విద్యా ప్రవర్ధనాం

**ZOOLOGY**

**COURSE OUTCOMES**

**(2018-23)**

**A.S.D GOVT. DEGREE COLLEGE FOR WOMEN (A), KAKINADA.**

**DEPARTMENT OF ZOOLOGY & AQUACULTURE TECHNOLOGY**

**ZOOLOGY COURSE OUTCOMES**

**(2018-2019)**

**COURSE OUTCOMES**

**SEMESTER-I**

**Animal Diversity – Non-chordates**

**Course Outcomes:** By the completion of the course the graduate should be able to –

**CO1:** Describe general taxonomic rules on animal classification

**CO2:** Classify Protozoa to Coelenterata with taxonomic keys

**CO3:** Classify Phylum Platyhelminthes 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 Hemichordate with suitable examples and larval stages in relation to the phylogeny

**SEMESTER-II**

**Animal Diversity – Chordates**

**Course Outcomes:** By the completion of the course the graduate should be able to –

**CO1:** Describe general taxonomic rules on animal classification of chordates

**CO2:** Classify Protochordata to Mammalian 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 mammalian.

**SEMESTER-III**

**Cytology, Genetics and Evolution**

**Course Outcomes:**

**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 aspects of genetics involved in sex determination, human karyo typing and mutations of chromosomes resulting in various disorder.

**CO5:** 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.

## **SEMESTER-IV (paper-IV)**

### **Embryology, Physiology and Ecology**

**Course Outcomes:** This course will provide students with a deep knowledge in Embryology, Physiology and Ecology, and by the completion of the course the graduate shall be able to –

**CO1:** Describe the key events in early embryonic development starting from the formation of gametes up to gastrulation and formation of primary germ layers.

**CO2:** Understand the functions of important animal physiological systems including digestion, cardiorespiratory and renal systems.

**CO3:** 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.

**CO4:** Analyze the basic factors affecting the ecosystem.

**CO5:** Apply the knowledge of ecology to conserve our natural habitat.

## **SEMESTER –V (paper –V)**

### **ANIMAL BIOTECHNOLOGY**

**CO1:** Get familiar with the tools and techniques of animal biotechnology.

**CO2:** To provide knowledge on animal cell and tissue culture and their preservation

**CO3:** To empower students with latest biotechnology techniques like stem cell technology, genetic engineering, hybridoma technology, transgenic technology, ART and their application in medicine and industry for the benefit of living organisms.

**CO4:** To get insight in applications of recombinant DNA technology in agriculture, production of therapeutic proteins.

**CO5:** To understand principles of animal culture, media preparation.

## **SEMESTER –V (paper –VI)**

### **ANIMAL HUSBANDRY**

**Course Outcomes:** This course will provide students with a deep knowledge in

**CO1:** Understand the field level structure and functioning of poultry and dairy sector and its role in food production.

**CO2:** Comprehend pertaining skills and their application to establish poultry and Dairy farm

**CO3:** Recognize different breeds of birds, Cows & buffaloes following safety precautions.

**CO4:** Prepare and give recommended feed and water for poultry and livestock.

**CO5:** Apply the health management techniques in poultry and livestock for increasing productivity.

## **SEMESTER –VI**

### **Cellular metabolism & Molecular Biology**

**Course Outcomes:** This course will provide students with a deep knowledge in **Cellular metabolism & Molecular Biology**, and by the completion of the course the graduate shall be able to –

**CO1:** Understand the basic knowledge of biomolecules.

**CO2:** Understand and apply the metabolism of enzymes & Carbohydrates.

**CO3:** Understand and apply the metabolism of proteins & lipids.

**CO4:** Identify the hereditary unit as gene & importance of DNA

**CO5:** Differentiate the functional aspects of genes in prokaryotes & eukaryotes.

## **SEMESTER –VI**

### **Cluster Elective Paper: VIII-B-1 PRINCIPLES OF AQUACULTURE**

**CO1:** Students can understand basic scenario of aquaculture.

**CO2:** Can identify different cultivable species

**CO3:** Can differentiate types of aquacultures and its systems

**CO4:** Can get the basic knowledge of the construction of fish pond.

**CO5:** Know the sources of seed and feed available for aqua forms and understand the management of carp and shrimp culture

## **SEMESTER –VI**

### **Cluster Elective Paper: VIII-B-2 AQUACULTURE MANAGEMENT**

**CO1:** Can understand the breeding and hatchery management in aquaculture.

**CO2:** Understand the importance of water quality.

**CO3:** Should know the feed management practices.

**CO4:** Analyse the importance of disease management

**CO5:** Understand the importance of fisheries in income generation food production and employment and research.

## **SEMESTER –VI**

### **Cluster Elective Paper: VIII-B-3 POSTHARVEST TECHNOLOGY**

**CO1:** Can get the techniques of handling of fish for preservation

**CO2:** Get the knowledge of fish preservation.

**CO3:** Applicate the processing of fish by-products.

**CO4:** Get the knowledge of importance of sea weed products.

**CO5:** Give importance of sanitation, quality assurance and certification for aqua products.

*H. Suvarchale*

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**A.S.D GOVT. DEGREE COLLEGE FOR WOMEN (A), KAKINADA.**

**DEPARTMENT OF ZOOLOGY & AQUACULTURE TECHNOLOGY**

**ZOOLOGY COURSE OUTCOMES**

**(2019-2020)**

**COURSE OUTCOMES**

**SEMESTER-I**

**Animal Diversity – Non-chordates**

**Course Outcomes:** By the completion of the course the graduate should be able to –

**CO1:** Describe general taxonomic rules on animal classification

**CO2:** Classify Protozoa to Coelenterata with taxonomic keys

**CO3:** Classify Phylum Platyhelminthes 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 Hemichordate with suitable examples and larval stages in relation to the phylogeny

**SEMESTER-II**

**Animal Diversity – Chordates**

**Course Outcomes:** By the completion of the course the graduate should be able to –

**CO1:** Describe general taxonomic rules on animal classification of chordates

**CO2:** Classify Protochordata to Mammalian 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 mammalian.

**SEMESTER-III**

**Cytology, Genetics and Evolution**

**Course Outcomes:**

**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 aspects of genetics involved in sex determination, human karyo typing and mutations of chromosomes resulting in various disorder.

**CO5:** 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.

## **SEMESTER-IV (paper-IV)**

### **Embryology, Physiology and Ecology**

**Course Outcomes:** This course will provide students with a deep knowledge in Embryology, Physiology and Ecology, and by the completion of the course the graduate shall able to –

**CO1:** Describe the key events in early embryonic development starting from the formation of gametes upto gastrulation and formation of primary germ layers.

**CO2:** Understand the functions of important animal physiological systems including digestion, cardiorespiratory and renal systems.

**CO3:** 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.

**CO4:** Analyze the basic factors affecting the ecosystem.

**CO5:** Apply the knowledge of ecology to conserve our natural habitat.

## **SEMESTER –V (paper –V)**

### **ANIMAL BIOTECHNOLOGY**

**CO1:** Get familiar with the tools and techniques of animal biotechnology.

**CO2:** To provide knowledge on animal cell and tissue culture and their preservation

**CO3:** To empower students with latest biotechnology techniques like stem cell technology, genetic engineering, hybridoma technology, transgenic technology, ART and their application in medicine and industry for the benefit of living organisms.

**CO4:** To get insight in applications of recombinant DNA technology in agriculture, production of therapeutic proteins.

**CO5:** To understand principles of animal culture, media preparation.

## **SEMESTER –V (paper –VI)**

### **ANIMAL HUSBANDRY**

**Course Outcomes:** This course will provide students with a deep knowledge in

**CO1:** Understand the field level structure and functioning of poultry and dairy sector and its role in food production.

**CO2:** Comprehend pertaining skills and their application to establish poultry and Dairy farm

**CO3:** Recognize different breeds of birds, Cows & buffaloes following safety precautions.

**CO4:** Prepare and give recommended feed and water for poultry and livestock.

**CO5:** Apply the health management techniques in poultry and livestock for increasing productivity.

## **SEMESTER –VI**

### **IMMUNOLOGY**

**Course Outcomes:** This course will provide students with a deep knowledge in immunology, and by the completion of the course the graduate shall able to –

**CO1:** To get knowledge of the organs of Immune system, types of immunity, cells and organs of immune system.

**CO2:** To trace the history and development of immunology

**CO3:** To provide students with a foundation in immunological processes i.e., antigen – antibody reactions

**CO4:** To be able to compare and contrast the innate versus adaptive immune systems and humoral versus cell-mediated immune responses

**CO5:** Understand the significance of the Major Histocompatibility Complex in terms of immune response and transplantation

#### **SEMESTER –VI**

##### **Cluster Elective Paper: VIII-B-1 PRINCIPLES OF AQUACULTURE**

**CO1:** Students can understand basic scenario of aquaculture.

**CO2:** Can identify different cultivable species

**CO3:** Can differentiate types of aquacultures and its systems

**CO4:** Can get the basic knowledge of the construction of fish pond.

**CO5:** Know the sources of seed and feed available for aqua forms and understand the management of carp and shrimp culture

#### **SEMESTER –VI**

##### **Cluster Elective Paper: VIII-B-2 AQUACULTURE MANAGEMENT**

**CO1:** Can understand the breeding and hatchery management in aquaculture.

**CO2:** Understand the importance of water quality.

**CO3:** Should know the feed management practices.

**CO4:** Analyse the importance of disease management

**CO5:** Understand the importance of fisheries in income generation food production and employment and research.

#### **SEMESTER –VI**

##### **Cluster Elective Paper: VIII-B-3 POSTHARVEST TECHNOLOGY**

**CO1:** Can get the techniques of handling of fish for preservation

**CO2:** Get the knowledge of fish preservation.

**CO3:** Apply the processing of fish by-products.

**CO4:** Get the knowledge of importance of sea weed products.

**CO5:** Give importance of sanitation, quality assurance and certification for aqua products.

*H. Suvarchala*

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**DEPARTMENT OF ZOOLOGY & AQUACULTURE TECHNOLOGY**

**ZOOLOGY COURSE OUTCOMES**

**(2020-2021)**

**COURSE OUTCOMES**

**SEMESTER-I**

**Animal Diversity – Biology of Non-chordates**

**Course Outcomes:** By the completion of the course the graduate should be able to –

**CO1:** Describe general taxonomic rules on animal classification

**CO2:** Classify Protozoa to Coelenterata with taxonomic keys

**CO3:** Classify Phylum Platyhelminthes 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 Hemichordate with suitable examples and larval stages in relation to the phylogeny

**SEMESTER-II**

**Animal Diversity – Biology of Chordates**

**Course Outcomes:** By the completion of the course the graduate should be able to –

**CO1:** Describe general taxonomic rules on animal classification of chordates

**CO2:** Classify Protochordata to Mammalian 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 mammalian.

**SEMESTER-III**

**Cytology, Genetics and Evolution**

**Course Outcomes:**

**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 aspects of genetics involved in sex determination, human karyo typing and mutations of chromosomes resulting in various disorder.

**CO5:** 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.



## **SEMESTER-IV (paper-IV)**

### **Embryology, Physiology and Ecology**

**Course Outcomes:** This course will provide students with a deep knowledge in Embryology, Physiology and Ecology, and by the completion of the course the graduate shall able to –

**CO1:** Describe the key events in early embryonic development starting from the formation of gametes upto gastrulation and formation of primary germ layers.

**CO2:** Understand the functions of important animal physiological systems including digestion, cardiorespiratory and renal systems.

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**CO5:** Apply the knowledge of ecology to conserve our natural habitat.

## **SEMESTER –V (paper –V)**

### **ANIMAL BIOTECHNOLOGY**

**CO1:** Get familiar with the tools and techniques of animal biotechnology.

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**CO3:** To empower students with latest biotechnology techniques like stem cell technology, genetic engineering, hybridoma technology, transgenic technology, ART and their application in medicine and industry for the benefit of living organisms.

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## **SEMESTER –V (paper –VI)**

### **ANIMAL HUSBANDRY**

**Course Outcomes:** This course will provide students with a deep knowledge in

**CO1:** Understand the field level structure and functioning of poultry and dairy sector and its role in food production.

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**CO5:** Apply the health management techniques in poultry and livestock for increasing productivity.

## **SEMESTER –VI**

### **IMMUNOLOGY**

**Course Outcomes:** This course will provide students with a deep knowledge in immunology, and by the completion of the course the graduate shall able to –

**CO1:** To get knowledge of the organs of Immune system, types of immunity, cells and organs of immune system.

**CO2:** To trace the history and development of immunology

**CO3:** To provide students with a foundation in immunological processes i.e., antigen – antibody reactions

**CO4:** To be able to compare and contrast the innate versus adaptive immune systems and humoral versus cell-mediated immune responses

**CO5:** Understand the significance of the Major Histocompatibility Complex in terms of immune response and transplantation

#### **SEMESTER –VI**

##### **Cluster Elective Paper: VIII-B-1 PRINCIPLES OF AQUACULTURE**

**CO1:** Students can understand basic scenario of aquaculture.

**CO2:** Can identify different cultivable species

**CO3:** Can differentiate types of aquacultures and its systems

**CO4:** Can get the basic knowledge of the construction of fish pond.

**CO5:** Know the sources of seed and feed available for aqua forms and understand the management of carp and shrimp culture

#### **SEMESTER –VI**

##### **Cluster Elective Paper: VIII-B-2 AQUACULTURE MANAGEMENT**

**CO1:** Can understand the breeding and hatchery management in aquaculture.

**CO2:** Understand the importance of water quality.

**CO3:** Should know the feed management practices.

**CO4:** Analyse the importance of disease management

**CO5:** Understand the importance of fisheries in income generation food production and employment and research.

#### **SEMESTER –VI**

##### **Cluster Elective Paper: VIII-B-3 POSTHARVEST TECHNOLOGY**

**CO1:** Can get the techniques of handling of fish for preservation

**CO2:** Get the knowledge of fish preservation.

**CO3:** Apply the processing of fish by-products.

**CO4:** Get the knowledge of importance of sea weed products.

**CO5:** Give importance of sanitation, quality assurance and certification for aqua products.

*H. Suvarchale*

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**DEPARTMENT OF ZOOLOGY & AQUACULTURE TECHNOLOGY**

**ZOOLOGY COURSE OUTCOMES**

**(2021-2022)**

**COURSE OUTCOMES**

**SEMESTER-I**

**Animal Diversity – Biology of Non-chordates**

**Course Outcomes:** By the completion of the course the graduate should be able to –

**CO1:** Describe general taxonomic rules on animal classification

**CO2:** Classify Protozoa to Coelenterata with taxonomic keys

**CO3:** Classify Phylum Platyhelminthes 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 Hemichordate with suitable examples and larval stages in relation to the phylogeny

**SEMESTER-II**

**Animal Diversity – Biology of Chordates**

**Course Outcomes:** By the completion of the course the graduate should be able to –

**CO1:** Describe general taxonomic rules on animal classification of chordates

**CO2:** Classify Protochordata to Mammalian 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 mammalian.

**SEMESTER-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, genetics, Molecular biology and Evolution and by the completion of the course the graduate shall able to–

**CO1:** understand the origin of cell and distinguish between prokaryotic and eukaryotic cell and the role of different cell organelles in maintenance of life activities

**CO2:** Analyze the history and basic concepts of heredity, variations, and gene interaction

**CO3:** Distinguish between polygenic, sex-linked, and multiple allelic modes of inheritance.

**CO4:** Acquire the basic concepts of molecular biology as to how characters are expressed with a coordinated functioning of replication, transcription, and translation in prokaryotes and Eukaryotes.

**CO5:** Appreciate the way of origin of life and understand the theories, forces of evolution and role of variations and mutations in evolution

#### **SEMESTER-IV (paper-IV)**

##### **Animal Physiology, Cellular Metabolism & Embryology**

**Course Outcomes:** This course will provide students with a deep knowledge in Animal Physiology, cellular metabolism & Embryology, and by the completion of the course the graduate shall be able to –

**CO1:** understand the various aspects of physiological systems and their functioning in animals.

**CO2:** Acquire the concept of hormonal regulation of physiology, metabolism, and reproduction in animals along with the disorders associated deficiency of hormones.

**CO3:** Assess the intersection between the disciplines of Biology and Chemistry and understand the structure and classification of carbohydrates, proteins, lipids, and enzymes.

**CO4:** Understand the fundamental biochemical principles such as the function of Biomolecules, metabolic pathways, and the regulation of biochemical processes.

**CO5:** Understands the key events in the formation and development of embryo.

#### **SEMESTER-IV (paper-V)**

##### **Immunology and Animal Biotechnology**

**Course Outcomes:**

On the completion of the course the student shall be able to –

**CO1:** Understand, compare, and contrast the innate versus adaptive immune systems and humoral versus cell-mediated immune responses

**CO2:** Differentiate antigens in nature and antibodies mechanism of action

**CO3:** Understand the latest trends in Biotechnology in the fields of industry and agriculture including animal cell/tissue culture, stem cell technology and genetic engineering.

**CO4:** Appreciate the technology related to transgenic animals' production.

**CO5:** Assess the importance of different techniques used in the Animal Biotechnology labs

#### **SEMESTER –V (paper –V)**

##### **ANIMAL BIOTECHNOLOGY**

**CO1:** Get familiar with the tools and techniques of animal biotechnology.

**CO2:** To provide knowledge on animal cell and tissue culture and their preservation

**CO3:** To empower students with latest biotechnology techniques like stem cell technology, genetic engineering, hybridoma technology, transgenic technology, ART and their application in medicine and industry for the benefit of living organisms.

**CO4:** To get insight in applications of recombinant DNA technology in agriculture, production of therapeutic proteins.

**CO5:** To understand principles of animal culture, media preparation.

## **SEMESTER –V (paper –VI)**

### **ANIMAL HUSBANDRY**

**Course Outcomes:** This course will provide students with a deep knowledge in

**CO1:** Understand the field level structure and functioning of poultry and dairy sector and its role in food production.

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**CO5:** Apply the health management techniques in poultry and livestock for increasing productivity.

## **SEMESTER –VI**

### **IMMUNOLOGY**

**Course Outcomes:** This course will provide students with a deep knowledge in immunology, 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 immune system.

**CO2:** To trace the history and development of immunology

**CO3:** To provide students with a foundation in immunological processes i.e., antigen – antibody reactions

**CO4:** To be able to compare and contrast the innate versus adaptive immune systems and humoral versus cell-mediated immune responses

**CO5:** Understand the significance of the Major Histocompatibility Complex in terms of immune response and transplantation

## **SEMESTER –VI**

### **Cluster Elective Paper: VIII-B-1 PRINCIPLES OF AQUACULTURE**

**CO1:** Students can understand basic scenario of aquaculture.

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## **SEMESTER –VI**

### **Cluster Elective Paper: VIII-B-2 AQUACULTURE MANAGEMENT**

**CO1:** Can understand the breeding and hatchery management in aquaculture.

**CO2:** Understand the importance of water quality.

**CO3:** Should know the feed management practices.

**CO4:** Analyse the importance of disease management

**CO5:** Understand the importance of fisheries in income generation food production and employment and research.

## SEMESTER –VI

### Cluster Elective Paper: VIII-B-3 POSTHARVEST TECHNOLOGY

**CO1:** Can get the techniques of handling of fish for preservation

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**CO5:** Give importance of sanitation, quality assurance and certification for aqua products.



*V. n. d.*  
Principal

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**DEPARTMENT OF ZOOLOGY & AQUACULTURE TECHNOLOGY**

**ZOOLOGY COURSE OUTCOMES**

**(2022-2023)**

**COURSE OUTCOMES**

**SEMESTER-I**

**Animal Diversity – Biology of Non-chordates**

**Course Outcomes:** By the completion of the course the graduate should be able to –

**CO1:** Describe general taxonomic rules on animal classification

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**CO4:** Describe Phylum Arthropoda to Mollusca using examples and importance of insects and Molluscs

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**SEMESTER-II**

**Animal Diversity – Biology of Chordates**

**Course Outcomes:** By the completion of the course the graduate should be able to –

**CO1:** Describe general taxonomic rules on animal classification of chordates

**CO2:** Classify Protochordata to Mammalian 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 mammalian.

**SEMESTER-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, genetics, Molecular biology 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 aspects of genetics involved in sex determination, human karyo typing and mutations of chromosomes resulting in various disorder.

**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.

#### **SEMESTER-IV (paper-IV)**

##### **Animal Physiology, Cellular Metabolism & Embryology**

**Course Outcomes:** This course will provide students with a deep knowledge in Animal Physiology, cellular metabolism & Embryology, and by the completion of the course the graduate shall able to –

**CO1:** understand the various aspects of physiological systems and their functioning in animals.

**CO2:** Acquire the concept of hormonal regulation of physiology, metabolism, and reproduction in animals along with the disorders associated deficiency of hormones.

**CO3:** Assess the intersection between the disciplines of Biology and Chemistry and understand the structure and classification of carbohydrates, proteins, lipids, and enzymes.

**CO4:** Understand the fundamental biochemical principles such as the function of Biomolecules, metabolic pathways, and the regulation of biochemical processes.

**CO5:** Understands the key events in the formation and development of embryo.

#### **SEMESTER-IV (paper-V)**

##### **Immunology and Animal Biotechnology**

##### **Immunology and Animal Biotechnology**

**Course Outcomes:** This course will provide students with a deep knowledge in immunology, and animal biotechnology and by the completion of the course the graduate shall 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.

**CO5:** To trace the history and development of immunology

**CO6:** To provide students with a foundation in immunological processes

**CO7:** To be able to compare and contrast the innate versus adaptive immune systems and humoral versus cell-mediated immune responses

**CO8:** Understand the significance of the Major Histocompatibility Complex in terms of immune response and transplantation



**CO9:** To provide knowledge on animal cell and tissue culture and their preservation

**CO10:** 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

**CO11:** To explain in vitro fertilization, embryo transfer technology and other reproduction manipulation methodologies.

**CO12:** To get insight in applications or recombinant DNA technology in agriculture, production of therapeutic proteins.

**CO13:** To understand principles of animal culture, media preparation.

#### **SEMESTER –V (paper – 6A)**

#### **SUSTAINABLE AQUACULTURE MANAGEMENT**

##### **COURSE OUTCOMES:**

By the completion of the course the student should be able to –

**CO1:** Evaluate the present status of aquaculture at the Global level and National level

**CO2:** Classify different types of ponds used in aquaculture

**CO3:** Demonstrate induced breeding of carps

**CO4:** Acquire critical knowledge on commercial importance of shrimps

**CO5:** Identify fin and shell fish diseases.

#### **SEMESTER –V (paper – 7A)**

#### **POSTHARVEST TECHNOLOGY OF FISH AND FISHERIES**

##### **Course Outcomes:**

By the completion of the course the graduate should able to –

**CO1:** Acquire the skill of handling of fish for preservation

**CO2:** Understand the knowledge of methods of fish preservation.

**CO3:** Understand and apply the processing of fish and its By-products.

**CO4:** Analyse the importance of sanitation and quality control in processing units.

**CO5:** Assess the need of quality assurance and certification for aqua products.

#### **SEMESTER –V (paper-6B)**

#### **LIVESTOCK MANAGEMENT-I (BIOLOGY OF DAIRY ANIMALS)**

##### **COURSE OUTCOMES:**

By the completion of the course the student should be able to –

**CO1:** Select the suitable breeds of livestock for rearing

**CO2:** Relate the anatomy of udder with letdown of milk

**CO3:** Identify and manipulate the reproductive behavior of cattle

**CO4:** Inspect the economics of dairy farming

**CO5:** Appreciate the various breeding techniques employed in livestock

**SEMESTER –V (paper-7B)**

**LIVESTOCK MANAGEMENT -II (DAIRY PRODUCTION AND MANAGEMENT)**

**Course Outcomes:**

By the completion of the course, the graduate should able to –

**CO1:** Identify and suggest the suitable housing system for the dairy farming

**CO2:** Understand management practices for the dairy farming

**CO3:** Understand the skills of pasteurization & sterilization methods.

**CO4:** Apply the skill to produce dairy products in their daily life.

**CO5:** Acquire the skills of separation techniques of cream from milk



V. n. b. d.  
Principal

PRINCIPAL  
A.S.D. GOVT. DEGREE COLLEGE (W)  
AUTONOMOUS  
KAKINADA