

**Pos & Cos with attachments**

**Department of Zoology**



**C.S.T.S GOVERNMENT KALASALA**

**JANGAREDDIGUDEM**

**2023-24**

# CSTS GOVERNMENT KALASALA, JANAGAREDDIGUDEM

## DEPARTMENT OF ZOOLOGY

PROGRAMME INFORMATION	
Program Title	B.Sc. (Botany ,Zoology, Chemistry (BZC
Awarding Institution	CSTS Government Kalasala, Jangareddigudem
Teaching Institution	CSTS Government Kalasala, Jangareddigudem
Faculty	R.Vijayadeepika
Department	Zoology
Mode and Period of study	Four Years Full Time

- This is our core Zoology courses, which cover topics in Animal Diversity, Physiology, Embryology, Genetics, ecology, Evolution & Aquaculture in all years of study.
- From 1<sup>st</sup> to 5<sup>th</sup> Semesters both programs follow the same core course content in the 6<sup>th</sup> Semester one common elective course and 3 cluster courses form the subject of student interest with in the programs they opted
- Practical experience in the lab is a major part of all Zoology courses.

### Programs outcomes:

**PO1: Fundamental Knowledge and Understanding:** Demonstrate comprehensive knowledge of the fundamental concepts in zoology including animal diversity, physiology, genetics, evolution, and ecology. Understand the principles of taxonomy, systematics, and phylogenetics to classify and identify different animal species accurately.

**PO2: Practical Skills and Techniques:** Develop practical skills in laboratory techniques such as microscopy, dissection, physiological experiments, and molecular biology techniques. Utilize fieldwork techniques for the collection, observation, and analysis of animal specimens in their natural habitats.

**PO3 : Analytical and Research Skills:** Apply scientific methods to design experiments, analyze data, and interpret results critically. Conduct independent research projects, demonstrating skills in data collection, statistical analysis, and scientific writing.

**PO4 : Environmental and Ethical Awareness:** Understand and appreciate the ecological roles of animals and the impact of human activities on biodiversity and ecosystems. Develop a strong ethical perspective regarding the treatment of animals and the importance of conservation efforts.

**PO5 : Technological Proficiency:** Employ modern technologies and tools such as bioinformatics, remote sensing, and geographic information systems (GIS) in zoological studies. Stay updated with recent scientific advancements and integrate new technologies in research and practical applications.

**PO6 : Professional and Personal Development:** Prepare for advanced studies or careers in zoology and related fields by developing a solid foundation of knowledge and skills. Cultivate a lifelong learning attitude, ethical professionalism, and a commitment to contributing positively to society and the scientific community.

### Course Outcomes:

#### Semester –I :Animal Diversity-Biology of Non-chordates

**CO1:** Classification and Characteristics: Describe the classification and general characteristics of major phyla of non-chordate animals.

**CO2:** Morphological and Anatomical Features: Identify and explain the morphological and anatomical features of selected non-chordate animals.

**CO3:** Evolutionary Relationships: Analyse the evolutionary relationships among different groups of non-chordate animals.

**CO4:** Ecological Roles: Discuss the ecological roles and economic importance of non-chordate animals in various ecosystems.

**CO5:** Laboratory Skills: Develop practical skills in the identification, dissection, and examination of non-chordate specimens in the laboratory.

5x6 mapping matrix of COs –POs is prepared in this regard for **Animal Diversity-Biology of Non-chordates** course in B.Sc program

COS/POS	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	-	-	2	-	-
CO2	3	3	-	-	-	-
CO3	3	3	3	-	-	-
CO4	-	3	-	2	2	-
CO5	-	-	3	-	-	2
AVERAGE	1.8	1.8	1.2	0.8	0.4	0.4

“1” – Slight (Low) Correlation,

“2” – Moderate (Medium) Correlation,

“3” – Substantial (High) Correlation,

“-” – Indicates there is no correlation

#### Semester –II : Animal Diversity-Biology of chordates

**CO1: Classification and Phylogeny:** Describe the classification and phylogenetic relationships of major groups of chordate animals.

**CO2: Morphological and Anatomical Features:** Identify and explain the morphological and anatomical features of selected chordate animals.

**CO3: Physiological Functions:** Analyze the physiological functions and adaptations of chordate animals to their environments.



**CO4: Ecological and Economic Importance:** Discuss the ecological roles and economic importance of chordate animals in various ecosystems.

**CO5: Laboratory and Field Skills:** Develop practical skills in the identification, dissection, and examination of chordate specimens in the laboratory and field settings.

5x6 mapping matrix of COs –POs is prepared in this regard for Animal Diversity-Biology of Chordates course in B.Sc program

COS/POS	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	-	-	2	-	-
CO2	3	3	-	-	-	-
CO3	3	3	3	-	-	-
CO4	-	3	-	2	2	-
CO5	-	-	3	-	-	2
AVERAGE	1.8	1.8	1.2	0.8	0.4	0.4

“1” – Slight (Low) Correlation,

“2” – Moderate (Medium) Correlation,

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### Semester –III : Cytology, Genetics, and Evolution

#### Program Outcomes (POs)

**PO1: Knowledge and Understanding:** Demonstrate comprehensive knowledge and understanding of cell structure and function, genetic principles, and evolutionary theories.

**PO2: Analytical and Critical Thinking:** Develop the ability to analyze and interpret scientific data related to cytology, genetics, and evolution using various scientific methods and tools.

**PO3: Research Skills:** Acquire skills to conduct independent research, including formulating hypotheses, designing experiments, and interpreting results in the fields of cytology, genetics, and evolutionary biology.

**PO4: Communication Skills:** Enhance written and oral communication skills to effectively convey scientific information related to cytology, genetics, and evolution to both scientific and non-scientific audiences.

**PO5: Ethical and Environmental Awareness:** Foster an understanding of the ethical implications and environmental impacts of genetic research and evolutionary studies.

#### Course Outcomes (COs)

**CO1: Cell Structure and Function:** Describe the structure, function of various cell organelles, and understand the principles of cellular organization.

**CO2: Genetic Inheritance and Variation:** Explain the principles of Mendelian and non-Mendelian inheritance, genetic variation, and the molecular basis of heredity.

**CO3: Molecular Genetics:** Analyze the mechanisms of DNA replication, transcription, translation, and gene regulation.

**CO4: Evolutionary Biology:** Discuss the principles of evolutionary biology, including natural selection, speciation, and the genetic basis of evolution.

**CO5: Laboratory Techniques:** Develop practical skills in cytological, genetic, and molecular biology techniques, including microscopy, DNA extraction, and PCR.

5x5 mapping matrix of COs –POs is prepared in this regard for **Cytology, Genetics, and Evolution** course in B.Sc program

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	3	-	-	2	-
CO2	3	3	2	-	2
CO3	3	3	3	-	-
CO4	3	3	-	2	2
CO5	-	-	3	-	-
AVERAGE	2.4	1.8	1.6	0.8	0.8

- “1” – Slight (Low) Correlation,  
“2” – Moderate (Medium) Correlation,  
“3” – Substantial (High) Correlation,  
“-” – Indicates there is no correlation

#### **Semester-IV : Embryology, Physiology, and Ecology**

##### **Program Outcomes (POs)**

**PO1: Comprehensive Knowledge:** Demonstrate a thorough understanding of the principles and concepts of embryology, physiology, and ecology.

**PO2: Analytical and Critical Thinking:** Develop the ability to critically analyze and interpret scientific data related to embryological development, physiological processes, and ecological interactions.

**PO3: Research Skills:** Acquire skills to conduct independent research, including designing experiments, collecting and analyzing data, and interpreting results in the fields of embryology, physiology, and ecology.

**PO4: Communication Skills:** Enhance written and oral communication skills to effectively convey scientific information related to embryology, physiology, and ecology to diverse audiences.



**PO5: Ethical and Environmental Responsibility:** Foster an understanding of the ethical considerations and environmental impacts of research and applications in embryology, physiology, and ecology.

### Course Outcomes (COs)

**CO1: Embryological Development:** Describe the stages of embryological development in various organisms and understand the underlying mechanisms of differentiation and growth.

**CO2: Physiological Processes:** Explain the physiological processes and regulatory mechanisms in animals and plants, including homeostasis, metabolism, and organ system functions.

**CO3: Ecological Interactions:** Analyze the interactions between organisms and their environments, including population dynamics, community structure, and ecosystem functioning.

**CO4: Experimental Techniques:** Develop practical skills in experimental techniques used in embryology, physiology, and ecology, such as microscopy, physiological measurements, and ecological field methods.

### CO5: Applied Knowledge

Apply knowledge of embryology, physiology, and ecology to address real-world problems, such as conservation, health, and environmental sustainability.

5x5 mapping matrix of COs –POs is prepared in this regard for **Embryology, Physiology, and Ecology** course in B.Sc program

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	-
CO2	3	3	2	1	-
CO3	3	3	2	-	2
CO4	-	-	-	2	-
CO5	-	-	-	-	1
AVERAGE	1.8	1.8	1.2	1	0.6

- "1" – Slight (Low) Correlation,
- "2" – Moderate (Medium) Correlation,
- "3" – Substantial (High) Correlation,
- "-" – Indicates there is no correlation

## Semester –IV B: Animal Biotechnology & Immunology

### Program Outcomes (POs):

**PO1: In-Depth Knowledge:** Demonstrate comprehensive knowledge of the principles and applications of animal biotechnology and immunology, including genetic engineering, immunological techniques, and their interconnections.

**PO2: Analytical and Problem-Solving Skills:** Develop the ability to critically analyze and solve complex problems related to animal biotechnology and immunology using advanced scientific methods and tools.

**PO3: Research and Technical Skills:** Acquire skills to design, conduct, and manage research projects in animal biotechnology and immunology, including hypothesis formulation, experimental design, data analysis, and interpretation.

**PO4: Communication Skills:** Enhance written and oral communication skills to effectively convey scientific information, research findings, and technological advancements in animal biotechnology and immunology to both scientific and non-scientific audiences.

**PO5: Ethical and Environmental Responsibility:** Foster an understanding of the ethical, legal, and socio-economic implications of research and applications in animal biotechnology and immunology, promoting sustainable and responsible practices.

### Course Outcomes (COs):

**CO1: Genetic Engineering in Animals:** Explain the principles and techniques of genetic engineering in animals, including gene cloning, transgenesis, and CRISPR-Cas9 technology.

**CO2: Immunological Techniques:** Describe and apply various immunological techniques, such as ELISA, Western blotting, flow cytometry, and immunohistochemistry, in research and diagnostics.

**CO3: Applications of Animal Biotechnology:** Analyze the applications of animal biotechnology in medicine, agriculture, and industry, including gene therapy, biopharming, and disease models.

**CO4: Immune System Mechanisms:** Explain the mechanisms of the innate and adaptive immune systems, including the roles of antibodies, cytokines, and immune cells.

**CO5: Ethical and Regulatory Issues:** Discuss the ethical, legal, and social issues related to animal biotechnology and immunology, including animal welfare, biosafety, and intellectual property rights.

5x5 mapping matrix of COs –POs is prepared in this regard for **Animal Biotechnology & Immunology** course in B.Sc program

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	-
CO2	3	3	2	1	-
CO3	3		2	-	
CO4	-	2	-		1



<b>CO5</b>	-	-		2	1
<b>AVERAGE</b>	1.8	1.6	1.2	1	1

- “1” – Slight (Low) Correlation,
- “2” – Moderate (Medium) Correlation,
- “3” – Substantial (High) Correlation,
- “-” – Indicates there is no correlation

## **Semester- V A : Sustainable Aquaculture Management**

### **Program Outcomes (POs):**

**PO1: In-Depth Knowledge:** Demonstrate a thorough understanding of the principles, practices, and technologies involved in sustainable aquaculture management.

**PO2: Analytical and Problem-Solving Skills:** Develop the ability to critically analyze and solve complex problems related to sustainable aquaculture management using advanced scientific methods and tools.

**PO3: Research and Technical Skills:** Acquire skills to design, conduct, and manage research projects in sustainable aquaculture, including hypothesis formulation, experimental design, data analysis, and interpretation.

**PO4: Communication Skills:** Enhance written and oral communication skills to effectively convey scientific information, management strategies, and research findings related to sustainable aquaculture to both scientific and non-scientific audiences.

**PO5: Ethical and Environmental Responsibility:** Foster an understanding of the environmental, ethical, and socio-economic impacts of aquaculture practices and promote sustainable and responsible aquaculture management.

### **Course Outcomes (COs)**

**CO1: Principles of Sustainable Aquaculture:** Explain the fundamental principles of sustainable aquaculture, including the ecological, economic, and social dimensions of aquaculture practices.

**CO2: Aquaculture Systems and Technologies:** Describe various sustainable aquaculture systems and technologies, such as integrated multi-trophic aquaculture (IMTA), recirculating aquaculture systems (RAS), and eco-friendly feed technologies.

**CO3: Environmental Management in Aquaculture:** Analyze strategies for managing environmental impacts in aquaculture, including water quality management, waste reduction, and habitat conservation.

**CO4: Health Management and Disease Control:** Identify best practices for maintaining health and managing diseases in aquaculture species, emphasizing biosecurity, vaccination, and sustainable health management practices.

**CO5: Socio-Economic and Ethical Considerations:** Discuss the socio-economic impacts of aquaculture, including community engagement, policy frameworks, and ethical considerations in sustainable aquaculture practices.



5x5 mapping matrix of COs –POs is prepared in this regard for **Sustainable Aquaculture Management** course in B.Sc program

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	3		-	1	-
CO2	3	3	2	1	-
CO3	-	2	2	-	1
CO4	-	2	2		
CO5	-	-	-	2	1
AVERAGE	1.2	1.4	1.2	0.8	0.4

“1” – Slight (Low) Correlation,

“2” – Moderate (Medium) Correlation,

“3” – Substantial (High) Correlation,

“-” – Indicates there is no correlation

## Semester- V B : Post-Harvest Technology of Fish and Fisheries

### Program Outcomes (POs)

**PO1: In-Depth Knowledge:** Demonstrate comprehensive knowledge of the principles, practices, and technologies related to post-harvest handling, processing, and preservation of fish and fisheries products.

**PO2: Analytical and Problem-Solving Skills:** Develop the ability to critically analyze and solve complex problems related to post-harvest technology in fisheries using advanced scientific methods and tools.

**PO3: Research and Technical Skills:** Acquire skills to design, conduct, and manage research projects in post-harvest technology, including hypothesis formulation, experimental design, data analysis, and interpretation.

**PO4: Communication Skills:** Enhance written and oral communication skills to effectively convey scientific information, technological advancements, and research findings related to post-harvest technology in fisheries to both scientific and non-scientific audiences.

**PO5: Ethical and Environmental Responsibility:** Foster an understanding of the environmental, ethical, and socio-economic impacts of post-harvest practices in fisheries, promoting sustainable and responsible technologies and methodologies.

### Course Outcomes (COs)

**CO1: Principles of Post-Harvest Technology:** Explain the fundamental principles of post-harvest technology for fish and fisheries, including the biology of fish spoilage, quality factors, and preservation techniques.

**CO2: Handling and Storage Techniques:** Describe various handling and storage techniques used in the post-harvest processing of fish, including chilling, freezing, and packaging methods.

**CO3: Processing and Value Addition:** Analyze different processing techniques and value addition methods, such as canning, smoking, drying, and the production of fish products and by-products.

**CO4: Quality Control and Safety:** Discuss the quality control measures and safety standards in post-harvest technology, including HACCP (Hazard Analysis Critical Control Point), GMP (Good Manufacturing Practices), and sanitation practices.

**CO5: Sustainable and Innovative Practices:** Evaluate sustainable and innovative practices in post-harvest technology, including waste management, utilization of by-products, and emerging technologies in the preservation and processing of fish and fisheries products.

5x5 mapping matrix of COs –POs is prepared in this regard for **Post-Harvest Technology of Fish and Fisheries**

course in B.Sc program

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	3		-	1	-
CO2	3	2	2	1	-
CO3	-	2	2	-	1
CO4	-	2	2	-	-
CO5	-	-	-	2	1
AVERAGE	1.2	1.2	1.2	0.8	0.4

- “1” – Slight (Low) Correlation,
- “2” – Moderate (Medium) Correlation,
- “3” – Substantial (High) Correlation,
- “-” – Indicates there is no correlation

Vijay  
Lec-in Zoology

Cham