



Dr.V.S.KRISHNA GOVT. DEGREE COLLEGE

(AUTONOMOUS)

NODAL RESOURCE CENTRE & AU CENTRE FOR RESEARCH

Maddilapalem, Visakhapatnam – 530013, Andhra Pradesh.

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DEPARTMENT OF ZOOLOGY

2021-2022

COURSE OUTCOMES

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PROGRAMME OUTCOMES

POs	Programme Outcomes
PO1	Critical Thinking: Ability to take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.
PO2	Effective Communication: Ability to speak, read, write, and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media, and technology.
PO3	Social Interaction: Ability to elicit views of others, mediate disagreements and help reach conclusions in group settings.
PO4	Effective Citizenship: Ability to demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.
PO5	Ethics: Ability to recognize different value systems including our own, understand the moral dimensions of your decisions, and accept responsibility for them.
PO6	Environment and Sustainability: Ability to understand the issues of environmental contexts and sustainable Development.
PO7	Employability skills: Equipping graduates with the essential abilities and knowledge to excel in their chosen careers.
PO8	Entrepreneurship skills: Seeks to empower students with the competencies needed to be successful entrepreneurs, enabling them to launch, operate, and innovate in their own businesses or entrepreneurial ventures.
PO9	Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes.

Program Specific Outcomes (PSOs)

PSOs	Program Specific Outcomes (PSOs)
PSO1	Ability to apply the knowledge of Chemistry, Botany and Zoology in addressing the real-time problems of the world
PSO2	Understanding the key aspects of structure, physiology, reproduction and developmental aspects of plant and animal communities and Showing empathy towards animals and considering them as his/her fellow-beings
PSO3	A step forward for the sustainable development of the nation by understanding the values embedded in studying the environment and ecology
PSO4	Life-long learning in the broadest context of technological advancements in various fields of biology.
PSO5	Understand the concepts of biology to create start-ups and apply the knowledge to get self-employed

Dr. V.S. KRISHNA GOVERNMENT DEGREE COLLEGE (A)
(w.e.f. 2021-22)

ZOOLOGY SYLLABUS FOR I SEMESTER

ZOOLOGY - COURSE -I

ANIMAL DIVERSITY – BIOLOGY OF NON-CHORDATES

Periods: 60

Max. Marks: 100

Learning Outcomes: On Completion of the course, the students will be able to

CO1: Understand different levels of biological diversity through the systematic classification of invertebrate fauna

CO2: Familiarize the student with the distinguishing characters of various phyla of Non0chordates by type studies and the study of specialized systems like canal system, water vascular system, torsion etc.

CO3: Understand the evolutionary relationships of different Invertebrate phyla with the study of connecting links like *Peripatus*, *Balanoglossus* and larval forms

CO4: Knowledge on the economic importance of sponges, corals, coral reefs, pearl oysters etc.

CO5: Application of knowledge for the preservation of animals and taxa – level identification of invertebrates

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(w.e.f. 2021-22)

ZOOLOGY SYLLABUS FOR II SEMESTER
ZOOLOGY - COURSE – II

ANIMAL DIVERSITY II – BIOLOGY OF CHORDATES

Periods:60

Max. Marks: 100

Learning Outcomes: On Completion of the course, the students will be able to

- CO1: Acquire in - depth knowledge on the diversity of chordates and their systematic position.
- CO2: Understand the characteristics and evolutionary importance of Prochordates
- CO3: Understanding the external features, internal anatomy and physiology of various classes of chordates by type studies
- CO4: Study and analyze the specialized features of various chordates such as types of scales and migration in fishes, identification of snakes, flight adaptations and migration in birds, Dentition in mammals etc.
- CO5: Taxonomic identification of chordates by observing preserved and taxidermic specimens of chordates

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(w.e.f. 2021-22)

ZOOLOGY SYLLABUS FOR III SEMESTER

ZOOLOGY - COURSE -III

**CELL BIOLOGY, GENETICS, MOLECULAR BIOLOGY AND
EVOLUTION**

Periods:60

Max. Marks:100

**Learning Outcomes: On Completion of the course, the
students will be able to**

CO1: Understand life in terms of the basic units of life called Cell and analysis of structure and functions of the various cell organelles including basic life forms such as prokaryotes, virus, viroids and mycoplasma

CO2: Understanding the concepts of History of evolution of Genetics and types of inheritance including polygenic, multiple allelic and sex linked inheritance including sex determination

CO3: A thorough understanding of various mutations and application of mutagens in causing mutational disorders and knowledge on basic genomics and proteomics

CO4: Understanding and evaluation of the central dogma of molecular biology with the knowledge of DNA Replication, Transcription, Translation and Gene Expression

CO5: Understand and acquire knowledge on the origin of life and critical evaluation of various theories of evolution, forces of evolution and Origin of new species

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(w.e.f. 2021-22)
ZOOLOGY SYLLABUS FOR IV SEMESTER
ZOOLOGY – COURSE – IV
ANIMAL PHYSIOLOGY, CELLULAR METABOLISM AND
EMBRYOLOGY

Periods: 60

Max. Marks: 100

COURSE OUTCOME WEIGHTED AVERAGE: 2.914

Learning Outcomes: On Completion of the course, the students will be able to

CO1: Acquisition of knowledge on functioning of various physiological aspects of the body and through analysis of the processes of digestion, respiration circulation and excretion

CO2: Understanding the role of ions in nerve cell transmission, molecules of muscle contraction and Analysis of different hormones and associated disorders

CO3: Critical analysis of various endocrine glands and associated disorders and role of hormones in controlling the reproduction in mammals

CO4: Knowledge on the molecules of life including carbohydrates, proteins and lipids, analysis of role of enzymes and evaluation of enzyme action

CO5: Understanding the key events in embryonic development from gametes to gastrulation

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ZOOLOGY SYLLABUS FOR V SEMESTER
(w.e.f. 2021-22)

ZOOLOGY - COURSE - V

IMMUNOLOGY AND ANIMAL BIOTECHNOLOGY

Periods:60

Max. Marks:100

COURSE OUTCOME WEIGHTED AVERAGE: 2.7034

Learning Outcomes: On Completion of the course, the students will be able to

CO1: Understand the principles of the immune system, types of immunity, cells/organs of the immune system and application of the knowledge on Vaccines for the benefit of the humans and other animals

CO2: Understand the properties and types of antigens and antibodies and evaluation of their role in immune response

CO3: To acquaint students with latest biotechnology techniques like cell culture, tissue culture, stem cell technology and hybridoma technology to foster a spirit of inquiry and orientation to research

CO4: Understanding the Gene Delivery Mechanisms, Concept and applications of assistive reproductive technologies and transgenic animals

CO5: Understanding the applications of biotechnology in fields of Industry and Agriculture including animal cell and tissue culture.

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ZOOLOGY SYLLABUS FOR V SEMESTER
(w.e.f. 2018-19)

ZOOLOGY - PAPER - V

ANIMAL BIOTECHNOLOGY

Periods:60

Max. Marks:100

Learning Outcomes: On Completion of the course, the students will be able to

CO1: Understand the Principles of Cloning strategies, gain knowledge on enzymes and cloning vectors and their uses in gene cloning technologies

CO2: Understand the gene delivery mechanisms, to acquire skills in PCR, Sanger's sequencing methods, blotting techniques

CO3: To acquaint students with latest biotechnology techniques like cell culture, tissue culture, stem cell technology and hybridoma technology to foster a spirit of inquiry and orientation to research

CO4: Understanding the assistive reproductive technologies and production of transgenic animals

CO5: Understanding the applications of biotechnology in fields of Industry and Agriculture including animal cell and tissue culture.

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ZOOLOGY SYLLABUS FOR V SEMESTER
(w.e.f. 2018-19)

ZOOLOGY - PAPER - VI
ANIMAL HUSBANDRY

Learning Outcomes: On Completion of the course, the students will be able to

CO1: Understanding the key concepts of poultry farming with reference to poultry housing and management of poultry chicken which makes the student self0employable

CO2: Knowledge on poultry feed and poultry diseases which helps the student to take up a start0up with a minimum investment for producing and supplying poultry feed

CO3: Knowledge on hatching, selection, testing of poultry eggs and sexing of chicken

CO4: Empower the student with the principles of dairy farming in terms of selection of site, dairy housing, identification of breeds and techniques involved in breeding so that he/she can get an employment in dairy industry

CO5: Understand and acquire knowledge on the care and management of dairy animals

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ZOOLOGY SYLLABUS FOR VI SEMESTER

(w.e.f. 2018-19)

ZOOLOGY –ELECTIVE PAPER:VII-(A)

IMMUNOLOGY

Periods: 60

Max. Marks: 100

Learning Outcomes: On Completion of the course, the students will be able to

CO1: Overview of the immune system including organs, cells and types of Immunity

CO2: Understand the concept of foreignness of antigen and receptors and factors associated with immunogenicity

CO3: Understanding the role of antibodies (immunoglobulins) in immunity and applications of monoclonal antibodies

CO4: Understand and analyze the role of Major histocompatibility complexes and cytokines in controlling the growth and activity of other immune system cells and blood cells

CO5: Knowledge on the key concepts of immune disorders associated with autoimmunity and hypersensitivity, apply the knowledge in combating various diseases through vaccines and evaluate the health benefits thereof

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ZOOLOGY SYLLABUS FOR CLUSTER ELECTIVE VIII-B: VI SEMESTER
(w.e.f. 2019-20)

AQUACULTURE

Cluster Elective Paper: VIII-B-1

PRINCIPLES OF AQUACULTURE

Periods: 60

Max. Marks: 100

COURSE OUTCOME WEIGHTED AVERAGE: 2.3527

Learning Outcomes: On Completion of the course, the students will be able to	Correlation with Bloom's Taxonomy Learning Levels	CO Learning Level Index	CO Attainment
CO1: Understanding the basics and history of aquaculture, identification of cultivable species and selection of site for aquaculture practices	Level 1 (Knowledge) Level 2 (Understanding) Level 3 (Application)	2.0	2.6301
CO2: Application of the knowledge of different types of aquaculture in various culture systems and practices	Level 1 (Knowledge) Level 2 (Understanding) Level 3 (Application)	2.0	2.6301
CO3: Create knowledge ecosystem in designing, construction and maintenance of aquafarms and appreciate the seed resources and nutritional requirements	Level 2 (Understanding) Level 3 (Application)	2.5	2.5376
CO4: Understand the culture of carps and shrimps and application of the knowledge in starting bio startUps and make students self0employable	Level 1 (Knowledge) Level 2 (Understanding) Level 3 (Application) Level 6 (Create)	3.0	2.4452
CO5: Application of culture aspects in cultivating sea weeds, shrimps, pearl oysters and ornamental fishes for aesthetic and economical purposes	Level 1 (Knowledge) Level 2 (Understanding) Level 3 (Application) Level 6 (Create)	3.0	2.4452

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ZOOLOGY SYLLABUS FOR CLUSTER ELECTIVE VIII-B: VI SEMESTER
(w.e.f. 2019-20)

AQUACULTURE

Cluster Elective Paper: VIII-B-2

AQUACULTURE MANAGEMENT

Periods: 60

Max. Marks: 100

Learning Outcomes: On Completion of the course, the students will be able to

CO1: Understanding the concept of breeding of shrimps and management of shrimp hatchery

CO2: Understanding the importance of water quality and soil quality in culture ponds and application of aeration and liming principles for improving the quality respectively

CO3: Knowledge on Live feeds used in aquafarms and application of the knowledge in feed formulation and preparation

CO4: Understanding the health management of aqua farms, immunization and vaccination

CO5: Understanding economics, extension and marketing aspects of aquaculture application of genetics to fish reproduction and preservation of gametes

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ZOOLOGY SYLLABUS FOR CLUSTER ELECTIVE VIII-B: VI SEMESTER
(w.e.f. 2019-20)

AQUACULTURE

Cluster Elective Paper: VIII-B-3

POST HARVEST TECHNOLOGY

Periods: 60

Max. Marks: 100

COURSE OUTCOME WEIGHTED AVERAGE: 2.6431

Learning Outcomes: On Completion of the course, the students will be able to

CO1: Understanding the importance of handling, temperature, radiation and spoilage in fish preservation

CO2: Understanding the different types of traditional and advanced methods of fish preservation and application of the technology for self employment

CO3: Application of the knowledge on the consumptive, economic and therapeutic value of fish products, fish byproducts and sea weed products

CO4: Understanding the significance of sanitation at personal and industry level and quality control of fishery products

CO5: Evaluation of processing industries based on national and international standards and understanding the maintenance of quality in industries