



**GOVERNMENT DEGREE COLLEGE
PALAKONDA - 532440**

Accredited with NAAC 'B' Grade
Affiliated to Dr.B.R.Ambedkar University, Srikakulam
Parvathipuram Manyam District, Andhra Pradesh



COURSE OUTCOMES (COs)

2022-23

III B.Sc. (CBZ) 2022-23

V. JANARDHANA RAO

LECTURER IN BOTANY

Programme (B.Sc.) Objectives:

The objectives of bachelor's degree programme with Botany are:

1. To provide a comprehensive knowledge on various aspects related to microbes and plants.
2. To deliver knowledge on latest developments in the field of Plant sciences with a practical approach.
3. To produce a student who thinks independently, critically and discuss various aspects of plant life.
4. To enable the graduate to prepare and pass through national and international examinations related to Botany.
5. To empower the student to become an employee or an entrepreneur in the field of Botany /Biology and to serve the nation.

Domain Subject (Botany) Objectives :

1. To impart knowledge on origin, evolution, structure, reproduction and interrelationships of microbes and early plant groups.
2. To provide knowledge on biology and taxonomy of true land plants within a phylogenetic framework.
3. To teach aspects related to anatomy, embryology and ecology of plants, and importance of Biodiversity.
4. To explain the structural and functional aspects of plants with respect to the cell organelles, chromosomes and genes, and methods of plant breeding.
5. To develop a critical understanding on SPAC, metabolism and growth and development in plants.
6. To enable the students proficient in experimental techniques and methods of analysis appropriate for various sub-courses in Botany.

Domain Subject (Botany) Outcomes:

1. Students will be able to identify, compare and distinguish various groups of microbes and primitive plants based on their characteristics.
 2. Students will be able to explain the evolution of tracheophytes and also distribution of plants on globe.
 3. Students will be able to discuss on internal structure, embryology and ecological adaptations of plants, and want of conserving Biodiversity.
 4. Students will be able to interpret life processes in plants in relation to physiology and metabolism.
 5. Students will be able to describe ultra-structure of plant cells, inheritance and crop improvement methods.
 6. Students will independently design and conduct simple experiments based on the knowledge acquired in theory and practical of the different sub-courses in Botany.
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<p>SEMESTER –I : Fundamentals of Microbes and Non- vascular Plants (Viruses,Bacteria, Fungi, Lichens,Algae and Bryophytes)</p>	<p>On successful completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • Explain origin of life on the earth. • Illustrate diversity among the viruses and prokaryotic organisms and can categorize them. • Classify fungi, lichens, algae and bryophytes based on their structure, reproduction and life cycles. • Analyze and ascertain the plant disease symptoms due to viruses, bacteria and fungi. • Recall and explain the evolutionary trends among amphibians of plant kingdom for their shift to land habitat. • Evaluate the ecological and economic value of microbes, thallophytes and bryophytes.
<p>SEMESTER –I : Practical syllabus of Fundamentals of Microbes and Non- vascular Plants (Viruses,Bacteria, Fungi, Lichens,Algae and Bryophytes)</p>	<p>On successful completion of this practical course, student shall be Able to;</p> <ul style="list-style-type: none"> • Demonstrate the techniques of use of lab equipment, preparing slides and identify the material and draw diagramsexactly as it appears. • Observe and identify microbes and lower groups of plants on their own. • Demonstrate the techniques of inoculation, preparation of mediaetc. • Identify the material in the permanent slides etc.
<p>SEMESTER –II : Basics of Vascular plantsand Phytogeography (Pteridophytes, Gymnosperms, Taxonomy of Angiosperms and Phytogeography)</p>	<p>On successful completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • Classify and compare Pteridophytes and Gymnosperms basedon their morphology, anatomy, reproduction and life cycles. • Justify evolutionary trends in trachaeophytes to adapt for land habitat. • Explain the process of fossilization and compare the characteristics of extinct and extant plants. • Critically understand various taxonomical aids for identification of Angiosperms. • Analyze the morphology of the most common Angiosperm plants of their localities and recognize their families. • Evaluate the ecological, ethnic and economic value of different trachaeophytes, their goods and services for human welfare. • Locate different phyto-geographical regions of the world and India and can analyze their floristic wealth.
<p>SEMESTER –II : Practical syllabus of Basics of Vascular plantsand Phytogeography (Pteridophytes, Gymnosperms, Taxonomy of Angiosperms and</p>	<p>On successful completion of this course students shall be able to:</p> <ul style="list-style-type: none"> • Demonstrate the techniques of section cutting, preparing slides, identifying of the material and drawing exact figures. • Compare and contrast the morphological, anatomical and reproductive features of vascular plants. • Identify the local angiosperms of the families prescribed to their genus and species level and prepare herbarium.

Phytogeography)

- Exhibit skills of preparing slides, identifying the given twigs in the lab and drawing figures of plant twigs, flowers and floral diagrams as they are.
- Prepare and preserve specimens of local wild plants using herbarium techniques

SEMESTER –III :
Anatomy and Embryology of Angiosperms, Plant Ecology and Biodiversity

On successful completion of this course, the students will be able to;

- Understand on the organization of tissues and tissue systems in plants.
- Illustrate and interpret various aspects of embryology.
- Discuss the basic concepts of plant ecology, and evaluate the effects of environmental and biotic factors on plant communities.
- Appraise various qualitative and quantitative parameters to study the population and community ecology.
- Correlate the importance of biodiversity and consequences due to its loss.
- Enlist the endemic/endangered flora and fauna from two biodiversity hot spots in India and assess Strategies for their conservation.

SEMESTER –III
:Practical syllabus of Anatomy and Embryology of Angiosperms, Plant Ecology and Biodiversity

On successful completion of this practical course students shall be able to:

- Get familiarized with techniques of section making, staining and microscopic study of vegetative, anatomical and reproductive structure of plants.
- Observe externally and under microscope, identify and draw exact diagrams of the material in the lab.
- Demonstrate application of methods in plant ecology and conservation of biodiversity and qualitative and quantitative aspects related to populations and communities of plants.

SEMESTER –IV(P-IV) :
Plant Physiology and Metabolism

On successful completion of this course, the students will be able to;

- Comprehend the importance of water in plant life and mechanisms for transport of water and solutes in plants.
- Evaluate the role of minerals in plant nutrition and their deficiency symptoms.
- Interpret the role of enzymes in plant metabolism.
- Critically understand the light reactions and carbon assimilation processes responsible for synthesis of food in plants.
- Analyze the biochemical reactions in relation to Nitrogen and lipid metabolisms.
- Evaluate the physiological factors that regulate growth and development in plants.
- Examine the role of light on flowering and explain physiology of plants under stress conditions.

SEMESTER –IV(P-IV) :
Practical syllabus of Plant Physiology and Metabolism

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

- Conduct lab and field experiments pertaining to Plant Physiology, that is, biophysical and biochemical processes using related glassware, equipment, chemicals

and plant material.

- Estimate the quantities and qualitative expressions using experimental results and calculations
- Demonstrate the factors responsible for growth and development in plants.

**SEMESTER –IV(P-V):
Cell Biology, Genetics
and Plant Breeding**

On successful completion of this course, the students will be able to:

- Distinguish prokaryotic and eukaryotic cells and design the model of a cell.
- Explain the organization of a eukaryotic chromosome and the structure of genetic material.
- Demonstrate techniques to observe the cell and its components under a microscope.
- Discuss the basics of Mendelian genetics, its variations and interpret inheritance of traits in living beings.
- Elucidate the role of extra-chromosomal genetic material for inheritance of characters.
- Evaluate the structure, function and regulation of genetic material.
- Understand the application of principles and modern techniques in plant breeding.
- Explain the procedures of selection and hybridization for improvement of crops.

**SEMESTER –IV(P-V) :
Practical syllabus of Cell
Biology, Genetics and
Plant Breeding**

After successful completion of this practical course the student shall be able to:

- Show the understanding of techniques of demonstrating Mitosis and Meiosis in the laboratory and identify different stages of cell division.
- Identify and explain with diagram the cellular parts of a cell from a model or picture and prepare models
- Solve the problems related to crosses and gene interactions.
- Demonstrate plant breeding techniques such as emasculation and bagging.

Course 6C: Plant Tissue Culture	<p>Students at the successful completion of the course will be able to:</p> <ul style="list-style-type: none"> • Comprehend the basic knowledge and applications of plant tissue culture. • Identify various facilities required to set up a plant tissue culture laboratory. • Acquire a critical knowledge on sterilization techniques related to plant tissue culture. • Demonstrate skills of callus culture through hands on experience. • Understand the biotransformation technique for production of secondary metabolites.
Course 6C: Practical syllabus of Plant Tissue Culture	<p>On successful completion of this practical course, student will be able to:</p> <ul style="list-style-type: none"> • List out, identify and handle various equipment in plant tissue culture lab. • Learn the procedures of preparation of media. • Demonstrate skills on inoculation, establishing callus culture and Micro propagation. • Acquire skills in observing and measuring callus growth. • Perform some techniques related to plant transformation for secondary Metabolite production.
Course 7C: Mushroom Cultivation	<p>Students at the successful completion of the course will be able to:</p> <ul style="list-style-type: none"> • Understand the structure and life of a mushroom and discriminate edible and poisonous mushrooms. • Identify the basic infrastructure to establish a mushroom culture unit. • Demonstrate skills preparation of compost and spawn. • Acquire a critical knowledge on cultivation of some edible mushrooms. • Explain the methods of storage, preparation of value-added products and marketing
Course 7C: Practical syllabus of Mushroom Cultivation	<p>On successful completion of this practical course, student will be able to:</p> <ul style="list-style-type: none"> • Identify and discriminate different mushrooms based on morphology.
	<ul style="list-style-type: none"> • Understand facilities required for mushroom cultivation. • Demonstrate skills on preparation of spawn, compost and casing material. • Exhibit skills on various cultivation practices for an • edible mushroom