

**VISVODAYA GOVT. DEGREE COLLEGE**  
**VENKATAGIRI:: TIRUPATHI DT.**



**DEPARTMENT OF BOTANY**

**COURSE OUTCOMES**

## **SEMESTER - I**

### **PAPER I: FUNDAMENTALS OF MICROBES AND NON VASCULAR PLANTS**

**(Viruses, Bacteria, Fungi, Lichens, Algae and Bryophytes)**

#### **Theory:**

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

- ❖ 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.

#### **Practical:**

- ❖ On successful completion of this practical course, student shall be able to
- ❖ Demonstrate the techniques of use of lab equipment, preparing slides and identify the material and draw diagrams exactly as it appears.
- ❖ Observe and identify microbes and lower groups of plants on their own.
- ❖ Demonstrate the techniques of inoculation, preparation of media etc.
- ❖ Identify the material in the permanent slides etc.

## **SEMESTER - II**

### **PAPER II: BASICS OF VASCULAR PLANTS AND PHYTOGEOGRAPHY**

**(Pteridophytes, Gymnosperms, Taxonomy of Angiosperms and Phytogeography)**

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

#### **Theory:**

- ❖ Classify and compare Pteridophytes and Gymnosperms based on their morphology, anatomy, reproduction and life cycles.
- ❖ Justify evolutionary trends in tracheophytes 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 tracheophytes and summarize their goods and services for human welfare.
- ❖ Locate different phytogeographical regions of India and can analyze their floristic wealth.

**Practical:**

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

- ❖ 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.
- ❖ 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****PAPER III- ANATOMY AND EMBRYOLOGY OF ANGIOSPERMS, PLANT ECOLOGY AND BIODIVERSITY****Theory:**

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.

**Practical:**

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****PAPER IV- PLANT PHYSIOLOGY AND METABOLISM**

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

**Theory**

- ❖ 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.

**Practical:**

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**

### **PAPER V- CELL BIOLOGY, GENETICS AND PLANT BREEDING**

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

**Theory:**

- ❖ 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.

**Practical:**

- ❖ 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.

## **SEMESTER - V**

### **Course-6A: Plant Propagation (Skill Enhancement Course)**

#### **Theory:**

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

- ❖ Explain various plant propagation structures and their utilization.
- ❖ Understand advantages and disadvantages of vegetative, asexual and sexual plant propagation methods.
- ❖ Assess the benefits of asexual propagation of certain economically valuable plants using apomictics and adventive polyembryony.
- ❖ Demonstrate skills related to vegetative plant propagation techniques such as cuttings, layering, grafting and budding.
- ❖ Apply a specific macro-propagation technique for a given plant species.

#### **Practical:**

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

- ❖ Make use of different plant propagation structures for plant multiplication.
- ❖ Explore the specialized organs or asexual propagules in some plants for their proliferation.
- ❖ Demonstrate skills on micropropagation of plants through vegetative propagation techniques.
- ❖ Evaluate and use a suitable propagation technique for a given plant species.

### **Course-7A: Seed Technology (Skill Enhancement Course (Elective))**

#### **Theory:**

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

- ❖ Explain the causes for seed dormancy and methods to break dormancy.
- ❖ Understand critical concepts of seed processing and seed storage procedures.
- ❖ Acquire skills related to various seed testing methods.
- ❖ Identify seed borne pathogens and prescribe methods to control them.
- ❖ Understand the legislations on seed production and procedure of seed certification.

#### **Practical:**

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

- ❖ Demonstrate skills on various methods to break the seed dormancy.
- ❖ Determine seed moisture, seed germination percentage, seed viability and vigour.
- ❖ Identify the seed borne pathogens and prescribe methods to prevent or control them.
- ❖ Evaluate various methods to produce healthy seeds.

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