

**Objective(s)**

To understand basic principles of plant physiological form and functions as well as processes and its importance in crop production.

**UNIT I**

Introduction, Definition of Plant Physiology, ecology, environments, plant hormones; Plant cells and cell metabolism; Impotence of Water, Diffusion and Osmosis process in plant; Transpiration, Solute Transport; Importance in Agriculture & its applications.

**UNIT II**

Definition of Growth and Development, Growth analysis, Importance parameters in growth and development; Plant nutrients, deficiency and toxicity symptoms of plant nutrients, Seed Physiology, seed viability and vigour, seed germination, Seed dormancy, causes and remedial measures for breaking seed dormancy.

**UNIT III**

Respiration and its significance, importance of glycolysis, TCA cycle, Pentose Phosphate Pathway; Detailed process of Photosynthesis: Light and dark Reactions; Differences between C<sub>3</sub>, C<sub>4</sub> and CAM plants and their Reactions (Calvin Cycle, C<sub>4</sub>, CAM), Factors affecting photosynthesis and crop productivity, Phytochromes and chlorophyll and other pigment systems.

**UNIT IV**

Plant growth regulators and their effect on plant growth and developments, Type of PGRs; Effects of PGRs on photomorphogenesis, Germination, Flowering, Fruit development and ripening as well as seed physiology.

**UNIT V**

Stress physiology and its significance. Plant physiology in relation to crop improvement.

**Reference Book(s):**

1. Plant physiology: Fundamentals and Applications: Arvindkumar and S.S. Purohit, Published by Agrobios (India)
2. Methods of plant growth analysis: R. Hunt
3. Crop Physiology: U.S. Gupta Published by Oxford & IBH Publishing Co, New Delhi
4. Plant Physiology by Salisbury, F. B. and Rose, C. W published by Cengage learning,
5. Plant physiology by Pandey, S. N., Sinha, B. K. published by Vikas publishing *house Pvt. Ltd, New Delhi*

**Practical(s):**

1. To demonstrate that the light is necessary for photosynthesis.
2. To demonstrate that the CO<sub>2</sub> is essential for photosynthesis
3. Measurement of water potential,
4. Measurement of leaf area by various methods,
5. Preparation of solutions for physiological studies in plants.
6. Methods of measuring water status in roots, stems and leaves.

7. Imbibitions and seed germination.
8. Breaking seed dormancy
9. Seed viability
10. Plant growth analysis
11. Laboratory visit and to understand use of IT in plant science.
12. Application of IT in plant physiological studies.