

## **BSH502PLANTP**

### **HYSIOLGY**

**52hrs**

*After successful completion of the course, students will be able to:*

**CO 1. Understand the role of various nutrients in plant growth**

CO 2. Comprehend the various concepts of water relation in plants and physiological processes.

CO 3. Gain in-depth knowledge on photosynthesis and regulatory mechanisms.

**CO 4. Understand role of various growth regulators in plant growth**

**CO 5. Gain knowledge on different methods and tools of plant breeding**

**CO 6. Understand plant pathology**

#### **Unit I (13 hours)**

**Plant nutrition:** Trace elements and their role, major and minor elements in soil and plants; Essentiality of elements- Sand culture, Soil culture, Hydroponics, Aeroponics; Mineral deficiencies and their rectification, nitrogen, phosphorus and sulfur metabolism.

#### **Unit II (13 hours)**

Water relations in plants: water requirements, Physical forces involved in water absorption, Osmotic system, Water potential, Site and path of water absorption; Ascent of Sap, mechanism of translocation of water and solutes; Factors affecting water absorption; Transpiration- Types of transpiration, structure and functions of stomata, mechanism of stomatal movement, Factors affecting transpiration, Guttation, anti-transpirants. Photosynthesis: Chloroplast and photosynthetic pigments; Concept of photosynthetic unit; Oxygenic and anoxygenic photosynthesis; Concept of pigment system; Stages of photosynthesis- cyclic and non-cyclic photophosphorylation; Hill reaction, Photorespiration; carbon dioxide fixation in C<sub>3</sub> and C<sub>4</sub> plants, CAM plants; Factors affecting photosynthesis.

#### **Unit III (13 hours)**

**Plant Growth and Growth Regulators-** Plant growth, Growth curve, measurement of growth, Phytohormones: Biosynthesis, Mechanism of action and application of auxins, gibberellins, cytokinins, ethylene, abscisic acid; Vernalin, Florigen, Morphactins; Phytochromes. **Plant breeding:** Objectives – high yield, improved quality, disease and pest resistance, early maturity, photosensitivity, varieties for new seasons, resistant varieties. Breeding in self-pollinated crops. Methods of breeding- Selection, Backcross method, Hybridization- objectives, types, procedure. Mutagenesis.

#### **Unit IV (13 hours)**

**Plant pathology-** Plant pathology in relation to important diseases of crop plants. Important plant diseases: Plant diseases caused by viruses, mycoplasma, bacteria, fungi, protozoa, nematodes, parasitic angiosperms - symptoms, etiology, life cycle, transmission etc.

Seed borne diseases and transmission: Pollination, fertilization, embryogenesis, morphology and physiology in relation to seed infection. Seed-borne pathogens and their importance - viruses, bacteria, fungi and nematodes; seed infection and contamination.