

W.e.f 20AH Batch

## SYLLABUS

**OBJECTIVES:** Enable the students to –

- Get a concept on advantages and disadvantages of hydroponics
- Know the formulations of media constituents
- Understand various nutritional systems for hydroponics
- Be aware of available techniques in hydroponics
- Ascertain the skills for crop cultivation

**COURSE OUTCOMES: Students will**

- **CO1:** Understand the concept of hydroponics and acquire the knowledge on soilless cultivation system
- **CO2:** Be capable to evaluate the role of both organic & inorganic nutrients and as well as abiotic factors
- **CO3:** Able to formulate the various media for hydroponics cultivation
- **CO4:** Be expertise in different techniques of hydroponics
- **CO5:** Be proficient in several cultivation methods for crop plants

### UNIT-I: INTRODUCTION TO SOIL LESS CULTURE

1. Definition, history and origin of soilless culture
2. Present status of hydroponics – contrasts with soil based culture
3. Applications and future developments

### UNIT – II: MACRONUTRIENTS & MICRONUTRIENTS

1. Functions and effect on plants
2. Deficiency symptoms of the following essential minerals  
N, P, Mg, Ca, K, S, Fe, Mn, Cu, Zn, B, Mo
3. Deficiency and symptoms of physical factors: Light (Quantity, energy & Photoperiodism etc.), Temperature (Heating & Cooling), Humidity, CO<sub>2</sub>, ppm, pH & TDS

### UNIT – III: CULTURAL CONDITIONS

1. Plant nutrition – Inorganic salts (Fertilizers): Major & minor nutrients formulating, monitoring and analysing
2. Selection of fertilizers and media used for hydroponics – Expanded clay, Rock wool, Coir, Perlite, Pumice, Vermiculite and Sand gravel etc.
3. Weed management, diseases and pest control

### UNIT – IV: TECHNIQUES IN HYDROPONICS

1. Static solution culture
2. Continuous – flow solution culture & aeroponics

## **UNIT V: Cultivation of crop plants by hydroponics**

1. Passive sub – irrigation, Ebb and flow or flood and drain irrigation
2. Deep water culture protocols for –
  - a) Tomato cultivation through Dutch bucket method
  - b) Chilly cultivation through Nutrient Film Technique system
  - c) Spinach through Raft system
3. Measurements of crop plant productivity

### **REFERENCES**

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2. Howard M. Resh. *Hobby Hydroponics*. CRC Press, USA.
3. Prasad S and Kumar U. *Green House management for Horticultural crops*. Agro-Bios India.
4. Dahama A.K. *Organic Farming for Sustainable Agriculture*. Agrobios, India
5. Subba Rao N.S. (1995). *Biofertilizers in Agriculture and Forestry*. Oxford and IBH Publishing Company. Pvt. Ltd New Delhi.

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