

Plant Tissue Culture

(One Year Certificate Course)

SEMESTER - I

Unit1 - Introduction - History, Scope and Concepts of basic techniques in plant tissue culture. Laboratory requirements and organization. Sterilization - filter, heat, wet and chemical. Media preparation – inorganic nutrients, organic supplements, carbon source, vitamins, gelling agents, phytohormones and growth regulators; composition

of commonly used culture media (MS and Gamborg's)

Unit2 - Types of Culture: Single cell culture, cell suspension culture, Protoplast culture, Artificial seed, Organogenesis, Callus culture

Unit3 - Micropropagation - Factors affecting morphogenesis and proliferation rate; technical problems in micropropagation, Production of virus free plants by meristem and shoot-tip culture

☐ Visit to National and International Plant tissue Culture Laboratories

Practical

Hands on practical: Commercial applications of plant tissue culture and nursery technology

1. Sterilization Techniques – Autoclave and Hot Air Oven,
2. Preparation of nutrient media.
3. Establishment of callus culture.
4. Organogenesis in callus cultures
5. Test tube plants
6. Micro propagation.
7. Isolation of plant secondary metabolites.
8. Importance of macro and micro nutrients, phytohormones, growth factors in Nursery

Semester -II

Unit 1 - Introduction to hands on techniques in plant tissue culture, preparation, handling, and establishing aseptic Cultures; Explants selection, sterilization and inoculation; Callus and cell suspension cultures; Induction And growth parameters.

Unit 2 - Genetic manipulation of plants, genetic transformation by *Agrobacterium tumefaciens*.
Transgenic plants for crop improvement

Unit 3- Plant nursery technology, elite plants for propagation, condition for establishments and maintenance of Nursery stock, Nutritional requirements of nursery stock,
Macronutrients, micronutrients, Organic Supplements, phytohormones and growth factors, mass production of nursery plants.

Practical

☑ One month Job Training Project in National and International Plant tissue Culture Laboratories