Department of Biotechnology

Academic Year: 2025-26

Title: Certification Course on Plant Tissue Culture Techniques

Course Duration & Schedule:

- **Total Duration:** 12 Days (4 hours per day)
- **Mode:** Hands-on practical sessions and theoretical lectures
- **Target Audience:** B.Sc. and M.Sc. Lifesciences students

Course Objectives:

By the end of this course, participants will be able to:

- ✓ Understand the fundamental principles and techniques of plant tissue culture.
- ✓ Gain practical skills in aseptic culture, media preparation, and plant regeneration.
- ✓ Explore micropropagation, somatic embryogenesis, and callus culture methods.
- ✓ Apply plant tissue culture techniques for research, conservation, and commercial purposes.
- ✓ Analyze and troubleshoot challenges in plant tissue culture experiments.

2. Content Outline

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Day 1–3:

- Introduction to plant tissue culture: history, scope, and applications
- Laboratory setup and biosafety practices
- Sterilization techniques: glassware, media, and explants

Day 4–6:

- Preparation of plant tissue culture media (MS medium and its modifications)
- Selection and preparation of explants
- Sterilization of explants

Day 7–9:

- Callus induction and maintenance
- Micropropagation techniques
- Organogenesis and somatic embryogenesis

Day 10–12:

- Theory for Hardening and acclimatization of regenerated plants
- Applications of tissue culture in crop improvement and secondary metabolite production
- Course Assessment & Feedback

3. Expected Outcomes

By the end of the course, participants will be able to:

- Understand the theoretical basis and practical applications of plant tissue culture.
- Demonstrate competence in laboratory skills including sterilization, media preparation, and culture handling.
- Apply tissue culture techniques for micropropagation and plant regeneration.
- Recognize the role of tissue culture in agriculture, horticulture, and biotechnology industries.
- Gain hands-on experience that enhances employability in research institutions, agribiotech companies, and commercial plant tissue culture labs.