



SAFI Institute of Advanced Study, (SIAS)

Syllabus for Certificate course Fundamentals of plant tissue culture (CTBT01)

Unit-I

Introduction - History, Scope and Concepts of plant tissue culture. Laboratory organization. Sterilization – Dry heat, moist heat, filter and chemical. Media preparation – inorganic nutrients, organic supplements, carbon source, vitamins, gelling agents, phytohormones and growth regulators; composition of commonly used culture media (Murashige and Skoog). (8 hrs)

Unit-II

Cell, tissue and organ culture - Isolation of single cells, selection and types of cells. Cell suspension cultures - batch, continuous. Somatic embryogenesis - Process of somatic embryogenesis, structure, stages of embryo development, factors affecting embryogenesis; production of artificial seeds; Germplasm conservation and Cryopreservation. Viability & potentiality test, gene sanctuaries. (8 hrs)

Unit-III

In vitro morphogenesis (Organogenesis – Meristem culture, Production of virus free plants, embryogenesis and synthetic seeds, significance studies on regeneration – single / multiple shoot, root formation, somoclonal variation and its significance, transfer and establishment of whole plants into soil). (8 hrs)

Practicals:

(12 hrs)

1. Sterilization methods: physical and chemical
2. Preparation of various tissue culture media: MS and Rooting media
3. Explant preparation, inoculation and initiation of tissue culture
4. Callus formation, Multiplication and Organogenesis
5. Micropropagation – Meristem and Nodal culture

Total: 36 hrs

References:

1. Bhojwani, S. S. and M. K. Razdan. 1996. Plant tissue culture : theory and practice, a revised edition. Elsevier Science, Netherlands.
2. Chawla, H. S. 2002. Introduction to plant biotechnology, 2nd ed. Science, India, USA. de Jong, J. 1990. Integration of in vitro techniques in ornamental plant breeding. Plant Breeding Research, Wageningen, Netherlands.
3. Debergh, P. C. and R. H. Zimmerman. 1990. Micropropagation : technology and application. Kluwer Academic, Netherlands.
4. Smith R.H (2000) Plant Tissue Culture: techniques and Experiments, Second edition, Academic Press, USA.