

Name of the Programme: M.Sc. Biotechnology

Course Code: GBT-512

Title of the Course: LAB V: PLANT AND ANIMAL TISSUE CULTURE

Number of Credits: 2

Effective from AY: 2022-23

Pre-requisites for the Course:	No prerequisite is required.	
Course Objectives:	1) To gain a comprehensive understanding of the growth and development of plants in vitro. 2) To understand the fundamentals of animal cell culture, and the growth and maintenance of animal cells under aseptic conditions.	
Content:	1. Preparation of starting material (Biosafety cabinet, solutions, media, cell sample etc.). 2. Cell stock preparation (glycerol stock), storage, freezing, thaw and subculture, contamination and precautions. 3. Animal cell culture: Secondary cell culture HeLa and non-cancerous cell lines HEK293, COS-7 4. Transfection and co-transfection: Calcium-phosphate method and Lipofection 5. Cell fixation and staining: Immunolabeling, mounting, fluorescence imaging.	No. of hours 30
	1. Tissue culture medium preparation, contamination and precautions in plant tissue culture 2. Callus induction from different explants such as rice and carrot 3. Plantlet regeneration. 4. Somatic embryogenesis 5. Single cell suspension. 6. Protoplast isolation	30
Pedagogy:	Hands-on experiments in the laboratory, online videos, and demonstrations.	
References/ Readings:	1. I.R. Freshney and A. Capes-Davis, Freshney's Culture of Animal Cells: A Manual of Basic Technique and Specialized Applications,	

	Wiley Blackwell Publisher, 2021. 2. I.R. Freshney and J.R.W. Masters, Animal cell culture – A Practical Approach Oxford University Press, 2000. 3. H. Sherathiya, Practical manual for Plant Tissue Culture: Basic Techniques of Plant Tissue Culture and Molecular Biology. Grin Verlag, 2013. 4. R. Smith, Plant tissue culture Techniques and experiment. Academic Press, 2012.
Course Outcomes:	1. The students will understand the basic concepts of pluripotency and totipotency in plant and animal tissue culture. 2. They will get a basic understanding of the media and growth parameters required for the culture of plant and animal tissues. 3. They shall learn to grow and maintain plant and animal cells/explants under aseptic conditions. 4. The students will be exposed to modern techniques of plant propagation through Somatic embryogenesis and cell suspension culture.