Lecture Plan

Name of the college: Government College of Arts, Science and Commerce, Sanquelim, Goa.

Name of Faculty: Ms. Shubha Shivdas Kauthankar	**Subject:** Botany	
Paper code: BOD 101- PLANT TISSUE CULTURE	**Program: T.Y.B.Sc.**	**Division: -**
Academic year: 2024- 2025	**Semester: V**	**Total Lectures: 45**

Course Objectives: 1) To study the concepts and basic Plant Tissue Culture techniques for regeneration of plants from cells and tissue

2) To acquire knowledge about applications of plant tissue culture in various fields.

Course Outcome: 1) Acquire knowledge about the concepts in plant tissue culture, sterilization techniques, Preparation of media (MS) and techniques used in plant regeneration.

2) Understand the applications of plant tissue culture in conservation.

Student Learning Outcome: 1) Understand the principles of Plant Tissue Culture.

2) Familiarize students with plant tissue culture laboratory setup including preparation of culture media.

3) Acquire knowledge about various in-vitro culture techniques for plant regeneration.

4) Understand various applications of plant tissue culture including in-situ and ex-situ conservation.

Month	Lecture From	Lecture To	No. of lectures allotted	Topic, Subtopic to be covered	Exercise/ Assignment	ICT Tools	Reference books
July 2024	08/07/2024	13/07/2024	3	Unit 01: Introduction to Plant Tissue Culture: concept and history. Plant tissue culture: pioneering work and significant achievements of Indian Scientists. Plant Tissue culture Laboratory design	To list Indian scientists in Plant tissue culture	Powerpoint presentation	Bhojwani, S.S. and Razdan, M.K. 1996. Plant Tissue Culture: Theory and Practice Razdan, M.K. 2003. An Introduction to Plant Tissue Culture De, K.K. 1992. Plant Tissue Culture
July 2024	15/07/2024	20/07/2024	3	Basic requirements and sterilization practices in Plant tissue culture. Unit 02: Plant Tissue culture techniques: packing and sterilization of glassware. Composition and types of media in plant tissue culture	-	Powerpoint presentation	
July 2024	22/07/2024	27/07/2024	3	Preparation and sterilization of culture media in plant tissue culture Selection, isolation, surface sterilization and inoculation of explants; establishment of invitro cultures.	To study methods of sterilization in PTC		

				Ideal conditions for incubation of cultures, maintenance of cultures and subculture; regeneration of plantlets.			Kumar, U. 2011. Methods in Plant Tissue Culture Nair, L.N. 2010. Methods in Microbial and Plant Biotechnology
July-August 2024	29/07/2024	03/08/2024	3	Acclimatization of tissue cultured plantlets in greenhouse/polyhouse. Unit 3: Cellular Totipotency and Differentiation- Concept Role of Plant growth regulators in tissue culture	To study the role of plant growth regulators in PTC		
August 2024	05/08/2024	10/08/2024	3	Role of meristems in tissue culture Characteristics of callus tissue, Somaclonal variation Organogenesis and embryogenesis			
August 2024	12/08/2024	17/08/2024	3	Preparation of synthetic seeds Unit 4: Types of cultures-protocol and application of callus culture	To study the concept of synthetic seeds		
August 2024	19/08/2024	24/08/2024	3	Protocol and application of meristem culture Embryo and root culture Anther and pollen culture and micro-propagation			

August 2024	26/08/2024	31/08/2024	3	Cell suspension culture: method of isolation of single cells, viability test Cell suspension culture protocol Types of cell suspension culture (batch and continuous), growth pattern of cells in batch culture	To study the method of cell suspension culture		
September 2024	02/09/2024	07/09/2024	3	Methods for measurement of growth of cells in suspension culture Applications of cell suspension cultures.	-		
September 2024	16/09/2024	21/09/2024	3	Somatic hybridization- concept and role of enzymes in protoplast isolation Mechanical and enzymatic method of protoplast isolation Testing viability of isolated protoplasts	To list the steps involved in protoplast isolation		
September 2024	23/09/2024	28/09/2024	3	Spontaneous fusion of protoplasts Induced fusion of protoplasts Selection of hybrid protoplasts			

September-October 2024	30/09/2024	05/10/2024	3	Culture of hybrid protoplasts, Applications of somatic hybridization Cybrids and their application	To study the concept of cybrids in PTC	
October 2024	07/10/2024	12/10/2024	3	Unit 6: Applications of plant tissue culture - concept, PTC for crop improvement in agriculture PTC in horticulture and forestry PTC for production of secondary metabolites in culture	To enlist the application of PTC in crop improvement	
October 2024	14/10/2024	19/10/2024	3	Cryopreservation Germplasm conservation (in-situ and ex-situ methods) Revision	To study the method of cryopreservation	
October 2024	20/10/2024	22/10/2024	1	Revision		

*** Assessment Rubrics**

Component	Max Marks
ISA 1	07
ISA 2	08
Practical	25
Project	-
Semester End Exam	60