

**B.Tech. Biotechnology: Semester-VI
BBT 601: PLANT BIOTECHNOLOGY**

Teaching Scheme	Examination Scheme
Lectures: 3 hrs/Week	Class Test -12 Marks
Tutorials: 1 hr/Week	Teachers Assessment – 6 Marks
Credits: 4	Attendance – 12 Marks
	End Semester Exam – 70 marks

Course Objective

To understand the concept of plant biotechnology and tissue culture, the techniques and their applications in the field of plant biotechnology will be covered as an objective to this course.

Course Learning Outcomes

- After completing the course, the student shall be able to:
- CO1: Understand the basic techniques used in cell and tissue culture
 - CO2: Understand the concept of totipotency
 - CO3: Identify basic aseptic techniques
 - CO4: Understand the process of somatic embryogenesis in plants.
 - CO5: Evaluate the applications of cloning in plants.

Unit 1: Introduction

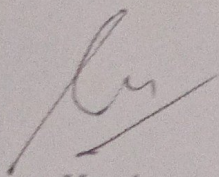
Terminology used in cell & tissue culture. Basic techniques of cell and tissue culture, surface sterilization, aseptic tissue transfer, concept of totipotency. Nutritional requirement of cell in vitro, various types of nutrient media. Basic aseptic techniques.

Physical Environment: Surface, P_H and Temperature. Chemical Environment: Properties of media, balanced salt solutions, Natural media, synthetic Media (with Serum & Serum free media), complex media. Primary Cell Culture: Disaggregation Techniques, Isolation, Propagation, Immortalization of cell lines, Routine maintenance.

Unit 2: Somatic Embryogenesis and Organogenesis in Plants

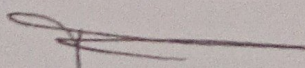
Somatic embryogenesis and organogenesis in plants. Variability in tissue cultures, somaclonal and other variations. Isolation of cells, single cell cultures and cloning. Zygotic embryo culture, Micropropagation and cloning of plants, applications of micro propagation in agriculture, horticulture & forestry.

Protoplast Isolation and culture, fusion of protoplast. Haploid Production: Introduction, Techniques, factors



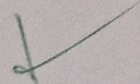
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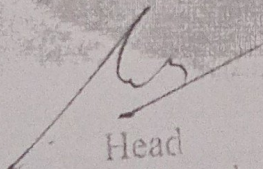
affecting embryogenesis, plant regeneration from poller embryo, gynogenesis diphedization to raise homozygous diploids applications, limitation.


Unit 3: Contamination and cytotoxicity:

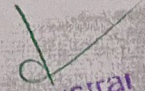
Sources and types of microbial contamination, Monitoring: Viability assay, Survival assay and transformation assay. Preservation of cell lines: cryopreservation, cell banks, transporting cells. Somatic Hybridization: somatic hybridization technology. Cell culture Parameters, Suspension culture.

Suggested Readings

- Plant tissue culture: SS Bhojwani and M.K. Razdan, Elsevier Science, The Netherlands.
- Cell culture methods and cell biology procedure: A. Doyle.
- Plant Tissue Culture – A practical Apporch: R.A. Dixon, IRL press.
- Cell and Tissue Culture: Lab procedures in biotechnology, Alan Doyal (ed) J.Bryan Griffith
- Doods. J.H. & Roberts L.W. (1985). Experiments in plant tissue culture Cambridge Univ.
- Animal Cell Culture by John R.W. Masters.
- Cell & Tissue Culture: Lab procedure in biotechnology alan Doxal(ed) J. Bryan scritith
- Animal or Animal cell & tissue culture techniques 5th freshness.


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