**PS807**: **MEDICINAL PLANT BIOTECHNOLOGY (Open Elective – III)**

**B. Pharm IV Year II sem**

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**Course Objective:** The topics are designed to help the students to get exposed to various techniques of plant tissue culture.

**Course Outcome:** Students will gain the knowledge about various strategies of plant tissue culture.

**UNIT - I**

History of Plant Tissue Culture, Laboratory Organization, Sterilization techniques (Aseptic transfer) Concepts of Totipotency, Physical and Chemical requirements, Media preparation, Explant preparation, establishment of Aseptic cultures (Callus and Suspention), of Plant Tissue Culture, Unorganized and Organized cultures, Measurement of Growth parameters, Biotechnological applications of Plant Tissue culture.

**UNIT - II**

Culture Techniques: Micro propagation of Medicinal and Aromatic plants, Organogenesis, Embryo genesis, Protoplast fusion, Cryopreservation and Synthetic seeds.

**UNIT - III**

Strategies for production of secondary metabolites-

a) Elicitation and Precursor feeding
b) Immobilization of Plant cells, Technique and its effects on secondary metabolites
c) Biotransformation of Plant Cell Culture and its importance in secondary metabolite production
d) Transgenic technology- Hairy root cultures, Shooty teratomass and their applications

**UNIT - IV**

Production of Secondary metabolites from callus culture and suspension culture with emphasis on production of biomedicinals like- Ajmalicine, Artemicin, Shikonin; Carotenoids and Rosemaric acid

**UNIT - V**

Metabolic engineering of secondary metabolic pathways, Scale up and commertialization of secondary metabolites . Large scale Cultivation of Plant Cells using Bioreactors: Introduction, Historical developments of bioreactors for Mass culture of plant cells, Types of Bioreactors, Bioreactors for different Plant tissue Cultures.

**TEXT BOOKS:**

1. Pharmacognosy and Pharmacobiotechnology by Ashutoshkar
2. Introduction to plant tissue culture by M.K.Razadam
3. Plant Tissue Culture by Bhojwani

**REFERENCES:**

1. Medicinal Plant Biotechnolgy by ciddi veeresham
2. Molecular Biology and Biotechnology by J.M.Walker and E.D.Gingo