

Devi Ahilya Vishwavidyalaya Indore (M.P.)

Department of Higher Education, Govt. of M.P.

Post Graduate Semester wise Syllabus

As recommended and Approved by Board of Studies D.A.V.V.

उच्च शिक्षा विभाग, म.प्र. शासन

स्नातकोत्तर कक्षाओं के लिये सेमेस्टर अनुसार पाठ्यक्रम

अध्ययन मण्डल देवी अहिल्या विश्वविद्यालय द्वारा अनुशंसित तथा अनुमोदित

Session (सत्र)

2020-21

M. Sc. Botany (Semester System)

Fourth Semester

Course PG 401:

Biotechnology

85+15

- UNIT I: **Plant Tissue Culture:** General introduction, History and scope and basic concepts, laboratory organization; media preparation and sterilization techniques, Nutrition of plant tissue - Growth limiting factors, Concept of cellular differentiation and totipotency, Types of culture, Embryo and endosperm culture, Induction and maintenance of callus and suspension culture.
- UNIT II: **Somatic embryogenesis:** Fundamental aspects of morphogenesis, study of differentiation through Organogenesis and Embryogenesis, Somatic embryogenesis, Zygotic vs. Somatic embryogenesis, Micropropagation, Advances and encapsulation of somatic embryo and shoot tip for artificial seeds and its applications. In vitro production of haploids for breeding and selection of mutants.
- UNIT III: **Protoplast culture:** Isolation, fusion, culture, hybrid selection and regeneration of Protoplast and possibilities with special reference to crop plants, Limitaion of protoplast research, Somatic hybridization and selection mechanism for hybrids and cybrids, cell line selection through callus/suspension culture for the production of stress resistant plants, their application in crop improvement.
- UNIT IV: **Clonal variation:** Clonal Propagation; Somaclonal and Gemetoclinal variations, Large scale clonally propagation of plants, Cryopreservation and germplasm storage. Embryo and endosperm culture. Genetic manipulation of plants: *Agrobacterium tumefaciens* and *Agrobacterium rhizogenes*.
- UNIT V: **Applications of plant tissue culture:** Productions of transgenic plants, methods of transformation in plants, Applications of plant tissue culture in forestry, ornamental plants, disease free plants and in the production of secondary metabolites and natural products. Role of tissue culture in Agriculture.

PRACTICALS: Laboratory exercises corresponding to theory courses covering.

20/11

26-3-19