MST302: TISSUE CULTURE	
Teaching Scheme Lectures: 3 hrs/Week Tutorials: 1 hr/Week Credits: 4	**Examination Scheme** Class Test -12Marks Teachers Assessment - 6Marks Attendance – 12 Marks End Semester Exam – 70 marks

Prerequisite: - MST101, MST151 Biochemistry, MST103, MST153 Molecular Biology, MST201, MST 251 Analytical Techniques.

Course Objectives:

1. To understand the basic of tissue culture methods in respect to animal and plant cell culture system in lab.
2. To learn few culturing methods that will help to understand the methods to prepare tissue cultures by Enzymatic, mechanical etc.
3. To learn and have complete knowledge of type of organ culture and their scale up.
4. To understand the isolation, preservation and maintenance of important tissue culture used for various purposes.
5. To learn cloning methods for the improvement of culture and their application in modern world.
6. To expertise in the process involved in animal and plant tissue culture and their associated methodology.

Detailed Syllabus

Unit-1 Animal tissue culture: Introduction- advantages and disadvantages of tissue culture; equipment for a tissue culture laboratory; aseptic techniques- sterile handling, standard procedures, sterilization; Culture vessels-substrates ; Media- properties, natural media, artificial media- serum containing media, serum free media , chemically defined media.
Unit-2 Primary culture- isolation of tissue by enzymatic methods, mechanical methods; Cell line- sub culture, routine maintenance, suspension culture, adherent culture, Cell quantitation- cell counting, Cytotoxicity-Viability assay using dye, cell proliferation assay, metabolic assay; Cryopreservation- need, methods and stages of cryopreservation. Contamination- source, monitoring for contamination.
Unit-3 Organ culture; Tumor cells & transformation; Scale up- batch culture, continuous culture, Scale up in monolayer; scale up in – suspension culture, Animal tissue culture products & application- vaccines, monoclonal antibodies, enzymes, hormones, factors.
Unit-4 Plant tissue culture- Introduction ; Methods- media preparation, aseptic techniques, sterilization, pretreatment to explant tissue; Callus culture, Meristem culture, Organ culture, Cryopreservation. Somatic hybridization-isolation of protoplast, viability testing of protoplast ,protoplast fusion, regeneration of plant, selection of fusion hybrid.
Unit-5 Cloning, Large scale culture, Somatic embryogenesis- development & application; Micropropagation – advantages, methods, application; Biochemical production, Somaclonal variation.

Head
Department of Biotechnology
Invertis University, Bareilly (U.P.)

Dean
Faculty of Science
Invertis University, Bareilly (U.P.)

Registrar
Invertis University,
Bareilly