6th Semester		Animal Biotechnology	L-T-P 3-0-0	3 CREDITS

MODULE-I Equipment and materials for animal cell culture, Design and layout of culture room, Sterilization and aseptic technique: Dry heat sterilization, moist heat sterilization, use of chemicals and radiation in sterilization procedure, Biosafety and Bioethics: Biosafety levels and containment facilities, Biosafety cabinets: principle and types.

MODULE-II Culture media: General considerations in media design, Natural media, Synthetic media, Nutritional compounds of media, Role of serum in cell culture. Primary culture and its maintenance: Various techniques of tissue disaggregation, Monolayer and suspension cultures. Growth curve, Establishment of cell line, cell counting, cell line nomenclature and maintenance

MODULE-III Cell separation, cell cloning: Dilution cloning and suspension cloning, isolation of clones, Characterization of cultured cell: Morphology of cells, Species identification; identification of tissue of origin, identification of specific cell lines. Transformation of cells: Characteristics of transformed cells Process of Immortalization (suppression of senescence genes, induction by viral genes, by induction of telomerase and by chemical carcinogens)

MODULE-IV Cytotoxicity studies: principle and assays, Cryopreservation Technique, Apoptosis and Necrosis: Detailed mechanism and assays, Three-dimensional culture: Multicellular tumour spheroids (mono- & co-culture)

MODULE-V Animal Biotechnology Applications- Tissue engineering: Design , cell substrates , cell sources, orientation and protocol, Hybridoma technology and production of monoclonal antibodies, Stem cell culture and its application, Scope of animal cell culture

Books

1. Culture of animal cells by R.I. Freshney.
2. Tissue Culture – Methods and Applications by Paul F. Kruse Jr. and M. K. Patterson, Jr
3. Animal Cell Culture: A Practical Approach by John R.W Masters