

**CBCS Related information:**

Faculty School of Life Sciences, D.A.V.V., Indore offers in the odd semester ( July 2015-Dec-2015), from 3.30 p.m. to 5.00 p.m. on Friday(s) and Saturday(s), following course of 3 credits.

The course content is as follows :

Title of the CBCS course : "TECHNIQUES IN LIFE SCIENCES"

3 Credit

**Unit I : Techniques in Microbiology and Plant tissue culture.**

Preparation and sterilization of solid and liquid culture media. Sources of type strains of microorganisms. Revival of cultures from lyophilized ampoules. Preservation and maintenance of microbial cultures. Fermentation : Submerged and solid state fermentations. Design of typical laboratory fermentor and its control.

Techniques of plant tissue culture and cell culture : Explant culture, anther and pollen culture, protoplast culture and protoplast fusion.

**Unit II : Instrumentation.**

Spectroscopy : Basic principles and applications of UV-Vis and Spectrofluorophotometry.

Chromatography : Principle, design and applications of TLC, GC and HPLC.

Centrifugation : Basic principles and types.

Electrophoresis : Basic principles and types.

**Unit III : Techniques in Plant Physiology and Environmental monitoring.**

Techniques in Plant physiology : Action and Absorption spectra, Photo-biological responses and photoreceptors. Artificial and natural light sources, Spectrograph and monochromatic radiation sources. Measurement of light and quantification of response. Responses induced by phytochrome, cryptochrome and UV-B photoreceptors. Inter-relationship between light and growth hormones. Environmental Monitoring techniques and Methodology-dissolved oxygen (DO), biological oxygen demand (BOD), chemical oxygen demand (COD) and total organic carbon (TOC).

**Unit IV : Techniques in Animal Physiology and Immunology.**

Techniques in Animal physiology : Basic principles and management of laboratory animals. Experimental designs for pre-clinical studies. *In-vivo* and *in-vitro* methods. Administration of drugs by different methods. Collection of blood and tissue samples. Different surgical techniques. Various assay procedures : Bioassay, hormone assay by RIA. Safety evaluation of a drug/compound.

Production of antibodies from laboratory animals. Monoclonal antibodies. Western blot and methods of band detection. Isolation of various immune cells and their functional assays. ELISA.

**Unit V : Techniques in Molecular biology.**

Isolation, purification and separation of nucleic acids. Hybridization techniques -Southern and Northern blotting. Polymerase chain reaction and its application. DNA sequencing methods (Sanger, Maxam-Gilbert). Microarray and RT-PCR.

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