

OBJECTIVES: To enable the students to –

- Develop familiarity with important biochemical & Biophysical techniques employed in biotechnological work.

COURSE:

UNIT I: SPECTROPHOTOMETRY

1. Concept of Electromagnetic radiations, spectrum of light, absorption of Electromagnetic radiations, absorption spectrum & its uses, Beer – Lambert's law.
2. Colorimeter. Instrumentation of UV & Visible spectrophotometry, double beam spectrophotometer.
3. Application of UV & Visible spectrophotometry.

UNIT II: CHROMATOGRAPHY

Chromatography: Principle, Methodology & Applications of

1. Paper chromatography.
2. Thin – layer chromatography
3. Gel filtration chromatography.
4. Ion exchange chromatography
5. Affinity chromatography

UNIT III: ELECTROPHORESIS

1. Migration of ions in electric field, factors effecting Electrophoretic mobility.
2. Paper Electrophoresis: Electrophoresis run, detection techniques, cellulose acetate electrophoresis,
3. Gel Electrophoresis: Types of gels, procedure, column and slab gels, detection, Recovery & estimation of macromolecules.
4. SDS – PAGE: Applications, determination of molecular weight of Protein, Molecular biology applications.
5. Isoelectric focusing: Principle, Establishing P^H , procedure and applications.

UNIT IV: ISOTOPIC TRACER TECHNIQUE:

1. Radioactive & stable isotopes, Rate of radioactive decay, units of radioactivity.
2. Measurement of Radioactivity: Ionization chamber, proportional counter, Geiger – Muller counter, solid & liquid scintillation counter (basic principle, Instrumentation & technique).
3. Applications of isotopes in biotechnology (distribution studies, metabolic studies, isotope dilution technique, clinical applications in autoradiography).

UNIT V: CENTRIFUGATION:

1. Basic principles, concept of RCF, Ultra centrifuge - Types
2. Preparative centrifugation: Differential & density gradient centrifugation, applications (isolation of cell components).
3. Analytical Centrifugation: Light absorption system, alternative schlieren system, Rayleigh interference system.
4. Dialysis & lyophilization.

REFERENCES:

1. Plummer – DT (1988) an introduction to practical Biochemistry. Tata McGraw Hill Co, New Delhi.
2. Wilson, K & Goulding K.M.(1986) A Biologist Guide to Principles & Techniques of Practical Biochemistry ELBS Public, New Delhi.
3. Stryer L (2000) Biochemistry – Freeman Toppan Delhi.
4. Lehninger (2000), Biochemistry Wortlo – Delhi.
5. Upadhyay, Upadhyay (2002) , Biophysical and Chemical Techniques, Himalayas Publications, New Delhi .

