

5th SEMESTER
DISCIPLINE SPECIFIC LELECTIVE COURSE (DSE)
BC520D: BIOCHEMISTRY: TECHNIQUES

CREDITS: THEORY-4, PRACTICAL: 2
MAXIMUM MARKS: 60, MINIMUM: 24

THEORY (4 CREDITS: 60 HOURS)

Objectives/Expected Learning Outcomes: This course introduces the students to basic techniques with an expectation to train/induct them for biological research in academia and industry.

Unit I: Spectroscopic techniques (15 HOURS)

Beer-Lambert Law, Light absorption and its transmittance, and application of extinction coefficient, applications of visible and UV spectroscopic techniques spectroflurometry, Quantitation of DNA, RNA and Proteins by UV spectrophotometry.

Unit II: Chromatography (15 HOURS)

General principles and applications of:

1. Molecular sieve chromatography
2. Ion exchange chromatography
3. Affinity chromatography
4. HPLC chromatography

Unit III: Electrophoretic and Immunological techniques (15 HOURS)

Basic principles of agarose electrophoresis, PAGE and SDS-PAGE, Isoelectrofocussing. Immune diffusion, Rocket immune electrophoresis, Radioimmunoassay, ELISA.

Unit IV: Biotechnology and Animal cell culture (15 HOURS)

Steps of gene cloning using Bacterial plasmid, Competent cells and Bacterial transformation, Restriction enzymes, PCR, DNA and Protein markers, Gene Knock-in and Knock-out.

Animal cell culture: Composition of culture media, Primary cell culture, Immortal and transformed cell lines.

PRACTICAL (2 CREDITS: 60 HOURS)

MAX.MARKS 30, MIN.12 MARKS

1. Separation of chlorophyll pigments by Silica gel chromatography.
2. PAGE
3. Separation of proteins by SDS-PAGE.
4. Agarose gel electrophoresis

BOOKS RECOMMENDED

1. Biophysical Chemistry by Uphadya, Uphadya and Nath
2. Principles and Techniques of Biochemistry and Molecular Biology by Keith Wilson and John Walker
3. Laboratory Manual of Biochemistry & Biotechnology by Syed Eazaz Hussain Rizvi.