

**SPACES DEGREE COLLEGE**  
**B.Sc. Biochemistry Semester wise Syllabus**

**BIO-CHEMISTRY**

**Course: Analytical techniques**

**Code: BCH-II**

**Unit-I: Cell homogenization and centrifugation** **12 hours**

Methods of tissue homogenization: (Potter-Elvehjem, mechanical blender, sonicator and enzymatic).  
Centrifugation techniques, principles and applications- differential, density gradient. Ultra-centrifugation- preparative and analytical.

**Unit-II: Chromatographic techniques** **12 hours**

Types of chromatographic techniques, Principle and applications - Paper chromatography- solvents, R<sub>f</sub> value, applications; Thin layer chromatography- principle, choice of adsorbent and solvent, R<sub>f</sub> value, applications; Gel filtration, Ion- exchange- principle, resins, action of resins, experimental techniques, applications, separation of metal ions; Affinity chromatography.

**Unit-III: Spectroscopy and tracer techniques** **12 hours**

Electromagnetic radiation, Beer-Lambert's law.

Colorimetry and Spectrophotometry, spectrofluorimetry, flame photometry. Tracer techniques: Radio isotopes, units of radio activity, half life,  $\beta$  and  $\gamma$ - emitters, use of radioactive isotopes in biology, ELISA, RIA.

**Unit-IV: Electrophoresis** **12 hours**

Electrophoresis- principles and applications of paper, polyacrylamide (native and SDS) and agarose gel electrophoresis, isoelectric focusing, immune-electrophoresis-types and applications

**Unit-V: Microbial techniques:** **12 hours**

Microscopy: Basic principles of light microscopy, phase contrast, electron microscope and fluorescent microscope and their applications.

Preparation of different growth media, isolation and culturing and preservation of microbes, Gram's staining- Gram positive and Gram negative bacteria, motility and sporulation, Sterilization techniques-Physical methods, chemical methods, radiation methods, ultrasonic and. Antibiotic resistance.

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### Practical BCP- 201 :

#### Biochemical Techniques

##### **List of Experiments:**

1. Isolation of RNA and DNA from tissue/culture.
2. Qualitative Identification of DNA,RNA and Nitrogen Bases
3. Isolation of egg albumin from egg white.
4. Isolation of cholesterol from egg yolk.
5. Isolation of starch from potatoes.
6. Isolation of casein from milk.
7. Separation of amino acids by paper chromatography.
8. Determination of exchange capacity of resin by titrimetry.
9. Separation of serum proteins by paper electrophoresis.

##### **Recommended books:**

1. Principles and Techniques of practical Biochemistry. Eds. Williams and Wilson.
2. Techniques in Molecular biology Ed. Walker & Gastra, Croom Helm, 1983.
3. Principles of instrumental analysis, 2nd Ed, Holt-Sanders, 1980.
4. An introduction to spectroscopy for Biochemistry. Ed. Brown S.N., Academic press
5. Analytical Biochemistry, Holmes and Hazel peck, Longman, 1983.
6. An introduction to practical biochemistry. David T. Plummer, Tata Mac Grew-Hill.
7. Biophysical chemistry, Edshall& Wyman, Academic press Vol. II & I.
8. A textbook of quantitative inorganic analysis including elementary instrumental analysis, Vogel ELBS.
9. Biochemical calculations Seigel, IH, 2nd Edit, John Wiley & sons Inc., 1983.
10. Analytical Biochemistry by Friefelder David