Proposed Syllabus for **Core Course** of **BG/UG 4th Semester** offered in the discipline/subject of **Clinical Biochemistry** at Cluster University Srinagar.

**Course Title:** **BIO-ANALYTICAL TECHNIQUES** **Credits : 06**

**Theory** **Credits: 04**

**Unit I:**
Centrifugation: Basic principle and its types, Sub-cellular fractionation, sedimentation, Velocity and sedimentation equilibrium, Density gradient centrifugation, Application of Centrifugation techniques. Radioisotopes Techniques- Types of radioactive decay, detection and measurement of radioactivity, application of radioisotopes in Clinical biochemistry

**Unit II:**
Spectroscopy. Beer Lamberts law. Basic principle and applications of colorimetry, UV-Vis spectrophotometry and Fluorescence spectroscopy. Microscopic Techniques: Principles, techniques and applications of light phase contrast and fluorescence microscopy. Electron microscopy-Introduction.

**Unit III:**
Electrophoresis: definition and basic principle of electrophoresis; Factors affecting migration rate, agarose gel electrophoresis- Principle, instrumentation and its applications. Polyacrylamide gel electrophoresis-Basic principle, Instrumentation and its applications. SDS-PAGE. Isoelectric focusing.

**Unit IV:**
Chromatography: Basic principle of chromatography; Paper and Thin Layer Chromatography - Basic principles, instrumentation and application; Column Chromatography - Basic principle and General techniques of chromatography with special reference to size exclusion chromatography and its applications

**Laboratory Course (Practicals)** **Credits: 02**

1. Spectrophotometric Analysis of DNA and Protein
2. Cellular fractionation of cell organelles
3. Agarose Gel Electrophoresis
4. Separation and identification of amino acids/sugars by paper chromatography
5. Demonstration of Column Chromatography

**Suggested Readings:**

1. Wilson & Walker, Principles and Techniques of Biochemistry & Molecular Biology, Cambridge University Press.
2. Freifelder D., Physical Biochemistry: Applications to Biochemistry and Molecular Biology, W.H. Freeman and Company (New York).
3. Boyer., Biochemistry Laboratory: Modern theory & Techniques, Pearson
4. Plummer D. T., Introduction to Practical Biochemistry, Tata McGraw Hill. (Third Edn.)
5. Boyer R., Modern Experimental Biochemistry, Pearson.
6. Deb A C, Practical Clinical Biochemistry, CBS Publishers.