

B.Tech. Biotechnology: Semester-III
BBT 306: ANALYTICAL TECHNIQUES

Teaching Scheme	Examination Scheme
Lectures: 3 hrs/Week	Class Test -12 Marks
Tutorials: 1 hr/Week	Teachers Assessment – 6 Marks
Credits: 4	Attendance – 12 Marks
	End Semester Exam – 70 marks

Course Objective

The objectives of this course are to provide the Students with the understanding of various analytical techniques used in biotechnology based research and industry. The course will acquaint the Students with the various instruments, their configuration and principle of working, operating procedures, data generation and its analysis.

Course Learning Outcomes

After completing the course, the student shall be able to:

- CO1: Apply basic principles of different analytical techniques in analytical work
- CO2: Use spectroscopy and radioactivity in biotechnological applications
- CO3: use microscopy, centrifugation and electrophoretic techniques.
- CO4: demonstrate principle and working of various instruments.
- CO5: use various techniques for solving industrial and research problems.

Unit 1: Microscopic Techniques

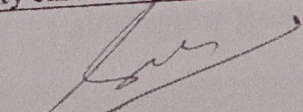
History, basic types of light microscopy and their applications in brief; Simple, compound, inverted, stereo, fluorescence, dark field and bright field microscope. Phase contrast microscopy: Amplitude and phase objects, wave terminology, positive or dark phase contrast and negative or bright phase contrast microscopy. Electron microscopy: Transmission Electron Microscope and Scanning Electron Microscope, sample preparation for EM, basic concept of confocal microscope.

Unit 2: Electrophoresis

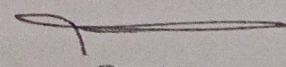
Principle and types of electrophoresis. Gel electrophoresis: Agarose gel electrophoresis, Sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE), Immuno electrophoresis, Capillary or tube gel electrophoresis, isoelectric focusing (IF), Two-dimensional (2D) electrophoresis. Western blotting technique.

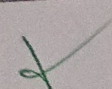
Unit 3: Chromatographic Techniques

Principle, application, affinity, mobile phase and stationary phase, types of columns, etc. Types of chromatography: Paper Chromatography, Gel filtration Chromatography, ion-exchange chromatography, affinity chromatography, High Performance Liquid Chromatography (Normal phase and reverse phase).


Head

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