

Department Name: Biotechnology

Semester - III

Course Title: Biotechnological Skills and Analytical Techniques	Course Code: 24MJBTEC3S
Total Contact Hours: 30 Hrs	No. of Credits: 02
L:T:P: 1:0:2	
Internal Assessment Marks: 10	Duration of SEE: 1hr, 30 Min
Semester End Exam Marks: 40	

Course Outcomes (COs):

At the end of the course, students will be able to:

1. To have a fundamental knowledge about the Light spectrum, Absorption, Fluorescence, NMR, Mass spectroscopy
2. To acquire knowledge on the different chromatographic methods for separation of biological products.

Unit	Description	Hours
1	<p>Introduction to Biotechnology Lab: Biotechnology Industry in Indian and Global context -organization in context of large /medium/ small enterprises, their structure and benefits.</p> <p>Methods and practices of cleaning and management of lab: Learning and Practice of Integrated clean-in-place (CIP) and sterilize-in-place (SIP) as per industry standards, material requirements for cleaning specific area, equipment, ventilation area, personal protective requirements.</p> <p>Procedure of cleaning and storage of Lab ware: Methodology for storage area, cleaning procedure and materials to be used for various surfaces. Sign boards, labelling do's & don'ts. Knowledge about standard procedures of cleaning or glass ware, plastic ware. Maintenance of inventory.</p> <p>Principles and practices of lab safety: Knowledge about safety symbols and hazard signs. Personal safety gears, utility, and disposal. Equipment safety protocols, chemical safety protocols. Documentation of chemical and equipment usage records. Handling hazardous chemicals.</p>	15Hrs
2	<p>Best practices of usage and storage of chemicals: Knowledge and practice in handling of chemicals, labelling and stock maintenance. SOP and material handling. Procedures to maintain chemicals, labelling, storage, and disposal.</p> <p>Preparation of solutions and standards: Properties and uses of chemicals commonly used in life sciences laboratories. Maintaining safety standards for handling various solutions and chemicals. Preparation of test reagents and buffers, Protocols for proper mixing of chemicals. Safety precautions while preparation and storage of incompatible chemicals and reagents.</p>	15Hrs

<p>Preparation of media: Maintenance and storage of purified water for media (Plant Tissue culture media, Microbiological media, and Animal cell culture media) preparation. Practical methods for decontamination and disposal: Decontamination methods, Safe disposal practices of decontaminated media or materials.</p> <p>Laboratory record writing: Method of record writing, data collection and recording, reporting of result, discussion of result, summary writing, effective PowerPoint presentation taking any experiment as example.</p>	
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References:

1. Rajeev Roy (2011) Entrepreneurship (2nd Ed) Oxford University Press
2. John Mullins (2013) The New Business Road Test (4th Ed) Financial Time series.
3. Denise M. Harmening. Laboratory Management, Principles and Processes, D.H. Publishing & Consulting Inc.; Third Edition, 2012
4. Biochemical Calculations, 2nd Ed., (1997), Segel Irvin H; John Wiley and Sons, NY
5. Biophysical Chemistry Principles & Techniques Handbook, (2003), A. Upadhyay, K.Upadhyay, and N. Nath
6. Enzymes: Biochemistry, Biotechnology & Clinical chemistry, (2001), Palmer Trevor, Publisher: Horwood Pub. Co., England.
7. Analytical Biochemistry, 3rd edition, (1998), David Holmes, H. Peck, Prentice-Hall, UK
