

Programme Outline: SYBSc (SEMESTER IV)

Course Code	Unit No.	Name of the Unit	Credits
SSEC403		BASIC INSTRUMENTATION TECHNIQUES	2
	1	Practical	

SEMESTER 4

NAME OF THE COURSE	BASIC INSTRUMENTATION TECHNIQUES
CLASS	SYBSC
COURSE CODE	SSEC403
NUMBER OF CREDITS	2
NUMBER OF LECTURES PER WEEK	4
TOTAL NUMBER OF LECTURES PER SEMESTER	60
EVALUATION METHOD	CONTINUOUS ASSESSMENT
TOTAL MARKS	50
PASSING MARKS	20

COURSE OBJECTIVES

CO 1.	To apply instruments like colorimeter and UV spectrophotometer
CO 2.	To learn techniques for separation of biomolecules and cells

COURSE LEARNING OUTCOMES:

CLO 1.	The learner will be able to apply the colorimeter by estimating the concentration of lactose in milk and protein content of yeast cells and also determining the approximate density of the bacterial suspension
CLO 2.	The learner will be able to develop skills to use instruments like centrifuges and UV-visible spectrophotometer

CLO 3.	The learner will be able to synthesize and characterize silver nanoparticles
CLO 4.	The learner will be able to identify and analyze biomolecules using chromatography and electrophoretic techniques
CLO 5	The learner will be able to set up an experiment for separation of cells using density gradient centrifugation

UNIT 1	PRACTICAL (60 LECTURES)
1.1	Colorimetric- Estimation of lactose content of milk using the DNSA method
1.2	Colorimetric- Estimation of the protein content of yeast cells using Robinson Hogden's method (indirect Biuret method)
1.3	Preparation of saline suspension of <i>E.coli</i> , adjusting the density using a colorimeter and correlation with the cell number.
1.4	Chemical synthesis of silver nanoparticles and confirmation using UV-visible spectrophotometer.
1.5	Separation of biomolecules by paper chromatography
1.6	Separation of biomolecules by Thin layer chromatography
1.7	Separation of biomolecules using column chromatography
1.8	Learn to operate a centrifuge - hands-on
1.9	Separation of a mixture of cells using Density gradient centrifugation
1.10	Separation of DNA using Agarose gel Electrophoresis

REFERENCES:

1. Plummer, David T. (1998). *An introduction to practical biochemistry* (3rd ed). Tata McGraw Hill edition.
2. Jayaraman. *Laboratory manual in biochemistry*. New Age International Publishers.
3. Willey, J.M., Sherwood, L.M., & Woolverton, C.J. (2008). *Prescott, Harley and Klein's Microbiology* (7th ed). McGraw Hill International Edition.
4. Madigan, M., Martinko, J., Bender, K., Buckley, D., & Stahl, D. (2015). *Brock Biology of Microorganisms* (14th ed). Pearson.
5. Wilson, Keith., & Walker, John. (2010). *Principles and Techniques of Biochemistry and Molecular Biology* (7th ed). Cambridge University Press.
6. Boyer, Rodney. (2000). *Modern Experimental Biochemistry* (3rd ed). Benjamin Cummings.
7. Himedia.

ASSESSMENT DETAILS:

Continuous Assessment (50 marks)

1. A minimum of two activities will be given in each semester.
2. Each will be for 20 marks.
3. The nature of the activities will be decided by the Examiner
4. 10 marks will be given for Class participation.