

SEMESTER I & II
LSM2201/LSM2201A - EXPERIMENTAL BIOCHEMISTRY

Prerequisite: LSM1101 or LSM1401

Workload: 10 lecture hours + 5 tutorial hours + 60 laboratory hours/12 lecture hours + 8 tutorial hours + 30 laboratory hours

Emphasis on principles and understanding of methods of protein purification and characterization. The module integrates factual knowledge in various chromatographic methods to laboratory practice. Analysis and presentation of data from mini-project and from journal articles.

S/N	Topics	Lecture hours
1.	Introduction Initial planning, Sources, Extraction, Solubilization, Buffer selection, Additives in buffer, Clarification and concentration of extract, Salting-in and salting out, Ammonium sulfate precipitation, Solvent precipitation and role of temperature	2 Kini RM
2.	Column chromatography Introduction and concept; principles and applications of gel filtration, ion exchange chromatography, hydrophobic interaction chromatography, reverse phase chromatography, Affinity chromatography Dye ligand (Pseudo affinity) chromatography, immunoaffinity chromatography, Purification table, Optimization of purification strategy, scaling up and scaling down, measurement of protein and enzymatic activity	6 Kini RM
3.	Principles and applications of Electrophoresis (native and SDS PAGE, isoelectrofocusing, 2D electrophoresis), Capillary electrophoresis; mass spectrometry (Electrospray ionization, matrix assisted laser desorption time of flight)	2 Kini RM
Total Lectures: 10h/12h		
Tutorials: 5h/8h		
Practicals: 6x5= 30h/30h		
Project work: 30h/none		
Total hours:		75h/50h

TEXT BOOKS

Protein Purification: Principles, High Resolution, Methods and Applications, J. C. Janson and L. Ryden; Wiley-Liss, New York, 1998

Protein Purification Techniques, S. Roe; Oxford University Press, Oxford, 2001 (2nd Edition)

REFERENCE BOOKS:

Protein Purification Methods: A Practical Approach, E. L. V. Harris and S. Angal; IRL Press, Oxford, 1995

Protein Purification: Principles and Practice, R. K. Scopes; Springer-Verlag, New York, 1982

MODE OF ASSESSMENT: 100% CA

MODULE CO-ORDINATOR:

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