

SEMESTER II
LSM3243 – MOLECULAR BIOPHYSICS

Prerequisite: LSM1101 and LSM3231

Workload: 26 lecture hours + 24 tutorial hours

This module provides a physical background of macromolecular conformations and a description of biophysical techniques for studies of structure, dynamics and interactions of biomolecules. Topics will include conformation of biological macromolecules, protein folding, protein-ligand interaction, biological membrane, and biophysical techniques.

S/N	Topics	Lecture hours
1.	Conformational Analysis and Forces that determine structures of protein and nucleic acid Potential energy, hydrogen bonding, hydrophobic , ion-ion , ion-dipole and dipole-dipole interactions, disulfide bonds Base pairing, base stacking Protein and DNA conformations	Yang D W 6
2.	Protein folding & Protein interaction conformational transitions in proteins and nucleic acids protein-protein and protein-ligand interactions kinetics of ligand interactions.	Mok Y K 6
3.	Biological membranes Lipids, micelles and bilayers, membrane, lipid-protein interactions Transport of small molecules across cell membrane	Yang D W 6
4.	Biophysical techniques for studies of structure, dynamics and interactions of proteins, nucleic acids and Membranes Circular dichroism, Fluorescence spectroscopy, Nuclear magnetic resonance	Yang D W 8
Total Lectures: 26h		
Tutorials : 20h		
Practicals: 2x2 h		
Total hours:		50h

TEXT BOOK (Reference books):

Biophysical Chemistry, Charles R.Cantor and Paul R.Schimmel, W.H.Freeman and Company, New York, 1980.
Principles of Biophysical Chemistry, Kensal E.Van Holde,W.Curtis Johnson and P.Shing Ho, Prentice-Hall International, Inc, 1998.

MODE OF ASSESSMENT: Exam (65%) + CA (35%)

MODULE CO-ORDINATOR:

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