

LS 450A	Biophysics and Structural Biology	2 Credits
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Name of the Faculty: Prof. S. Gourinath*, Prof. A.K. Saxena, Dr. Karunakar kar		
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S. No.	Topic	Faculty Name/ Contact Hours
Conformation of Macromolecule		
1	Introduction, Interaction in biological systems	SGN/1
2	Structure of Biomolecules and confirmations of proteins and nucleic acids	SGN/2
3	Motifs, Domains, tertiary, quaternary, and supramolecular structures of proteins	SGN/4
4	Primary and secondary structure of RNA and DNA	SGN/2
5	Structural Prediction and Conformational Analysis	SGN/2
Biophysical Methods and Analysis		
6	Ultra-centrifugation, Sedimentation velocity, and equilibrium-determination of molecular weights	KK/1
7	UV Visible Spectroscopy, Fluorescence Spectroscopy, Forster resonance energy transfer (FRET)	KK/3
8	Protein stability and folding: techniques for confirming native structure	KK/1+1
9	Nuclear Magnetic Resonance (NMR)	KK/1+1
10	Electron microscopy (SEM, TEM, Cryo-EM)	AKS/2
11	Circular Dichroism Spectroscopy	AKS/2
12	Crystallization, Crystal lattices, Symmetry, Space group, Bragg's law in real & reciprocal space	AKS/4
13	Analytical methods to study protein-protein interactions: BLI, MST	SGN / 1

Suggested reading:

1. Biophysical Chemistry by Cantor & P Schimmel Vol I & II
2. Physical Biochemistry by David I Freifelder
3. Proteins: Structures and Molecular Properties by TE Creighton