

Core Course**LS 455 – BIOPHYSICS AND STRUCTURAL BIOLOGY [2 credits]**

S Gaurinath*, Ajay K Saxena, Karunakar Kar

S No	Topic	Faculty	Contact Hours
1.	Introduction, Interaction in biology systems	SGN	1
2.	Structure of Biomolecules: and confirmations of protein 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.	Method of conformational analysis and prediction of conformation	SGN	2
6.	Ultra-centrifugation, Sedimentation velocity and equilibrium-determination of molecular weights	KK	1
7.	UV Visible Spectroscopy, Fluorescence Spectroscopy, Förster resonance energy transfer (FRET)	KK	3
8.	Protein stability and folding, techniques for confirming native structure	KK/AKS	1+1
9.	Nuclear Magnetic Resonance (NMR)	KK/AKS	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

Suggested reading:

1. Biophysical Chemistry by Cantor & P. Schimmel. Vol. I & II
2. Physical Biochemistry by David I Reifelder
3. Protein: Structure & molecular Properties by TE Creighton