

Core Course

LS 455 – BIOPHYSICS AND STRUCTURAL BIOLOGY [2 credits]

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S. No	Topic	Contact Hours
1.	Introduction, Interactions in biology systems	1 (SGN)
2.	Structure of Biomolecules: confirmations of protein and nucleic Acids	2 (SGN)
3.	Motifs, Domains, tertiary, quaternary and supramolecular structures of proteins	4 (SGN)
4.	Primary and secondary structure of RNA and DNA	2 (SGN)
5.	Methods for conformational analysis and prediction of conformation	2 (SGN)
6.	Ultra-centrifugation, Sedimentation velocity and equilibrium-determination of molecular weights	1 (KK)
8.	UV Visible Spectroscopy, Fluorescence Spectroscopy, Förster resonance energy transfer (FRET)	3 (KK)
7.	Protein stability and folding, techniques for confirming native structure,	1+1 (AKS / KK)
9.	Nuclear Magnetic Resonance (NMR)	1+1 (KK/AKS)
10.	Electron microscopy (SEM, TEM, Cryo-EM)	2 (AKS)
11.	Circular Dichroism (CD) Spectroscopy	2 (AKS)
12.	Crystallization, Crystal lattices, Symmetry, Space group, Bragg's law in real & reciprocal space	4 (AKS)

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