

# **BSE321A - Structural Biology**

<b>Instructor:</b>	Dr. Arun K. Shukla
<b>Contact:</b>	Dr. Shukla - Lab no. 3, ground floor, BSBE department Phone: 4251 (Dr. Shukla's office), 4058 (Dr. Shukla's lab) For after class questions - Friday: 10AM-11AM (Dr. Shukla's office)
<b>Course venue:</b>	BSBE Seminar Room
<b>Schedule:</b>	Tuesday (3PM-3.50 PM), Thursday (3PM-3.50PM), Friday (2PM-3.50PM)
<b>Grading scheme:</b>	10% for Quiz – I (before mid-sem exam) 25% for mid-semester examination 10% for Quiz – II (before end-sem exam) 25% for end-semester examination 30% for project work and presentation

*The grading scheme is tentative and can be altered on instructor's discretion. Any changes will be communicated to you in advance.*

**Final grade:** Final grades will be relative.

**Recommended books:**

- 1) Protein Structure and Function, By Gregory A Petsko and Dagmar Ringe, New Science Press.
- 2) Introduction to Protein Structure, Branden & Tooze, Garland Publishing.
- 3) Outline of Crystallography for Biologists, David Blow, Oxford University Press.

**Course content:**

Part I - Principles of Protein Structure – from primary sequence to three dimensional structure, elementary ideas of bonding and structure, the building blocks, motifs of protein structure, prediction, design and engineering of protein structures, membrane proteins and signaling complexes.

Part II - The Structural Basis of Protein Function, four fundamental biochemical functions of proteins, recognition, complementarity and active sites, flexibility and protein function, location and nature of binding sites, functional properties of structural proteins, control of protein function, mechanisms of regulation.

Part III - Determination of 3D-Structures using X-ray crystallography – an overview of the method. Laboratory experiments - protein preparation for crystallization experiments, protein crystallization, Evaluating the quality of crystals, Cryo-protecting crystals at low temperature for data collection. X-ray diffraction data collection and processing – a demonstration session.

**Special note: Do not plagiarize**

According to Merriam-Webster dictionary "plagiarism" means the act of stealing or passing off other person's ideas or words as one's own without crediting the source. Plagiarism is a very serious offence. For this course and in future as well, you must refrain from plagiarizing. If you are found plagiarizing your mid/end semester examination answers or any other assignment, you will get "zero" marks for the entire exam. IF YOU ARE FOUND CHEATING IN ANY OF THE EXAMS OR ASSIGNMENTS, YOU WILL GET "F" GRADE AND THE CASE WILL BE REPORTED TO APPROPRIATE AUTHORITIES.