

Course contents for Analytical Methods in Biophysics**1. Faculty:** FLSB**2. Course Code:****3. Course Title:** Analytical Methods in Biophysics**4. Number of Credits:** Two**5. Course objective:**

The course aims to provide students with a foundation in the basic concepts of various analytical methods in Biophysics. It will help students to apply physical science for the investigation of the biological system. Fundamental concepts that underlie bimolecular interactions will be discussed, and biophysical methods that are employed for the structural analysis of these systems will be introduced at an elementary level. Another critical component of this course is Bio-imaging, which will provide an in-depth understanding of various microscopic techniques and image processing/analysis tools.

6. Minimum prerequisites for taking this course, if any: Masters degree in Biology, Biophysics, Biochemistry, Biotechnology, Bioinformatics, Chemistry, or other related fields.**7. Course structure with units, if applicable:**

- a) Microscopy & Imaging
- b) Spectroscopy – Basic concepts, fluorescence spectroscopy, and circular dichroism
- c) Macromolecular NMR
- d) X-ray crystallography
- e) Microscale Thermophoresis (MST)
- f) Isothermal Titration Calorimetry (ITC)
- g) Structural Bioinformatics

8. Reading suggestions:

- Advanced Techniques in Biophysics by José Luis R. Arrondo (Editor); Alicia Alonso (Editor) ISBN: 9783540307006
- Methods in Molecular Biophysics by Igor N. Serdyuk; Joseph Zaccai; Nathan R. Zaccai ISBN: 9780521815246
- C. Branden, J. Tooze. “Introduction to Protein Structure.” Garland Science Publishing, 1999.
- Crystallography Made Crystal Clear by: Gale Rhodes (February 16, 2006)
- “Spin Dynamics: Basics of Nuclear Magnetic Resonance” by Malcolm H Levitt
- “Nuclear Magnetic Resonance Spectroscopy in Molecular Biology” by A Pullman
- Methods in Modern Biophysics by Bengt Nölting ISBN: 9783540277040
- MicroscopyU: Nikon’s microscopy education resource
- Quantitative Imaging in Cell Biology: A book edited by Jennifer Waters & Torsten Wittmann
- Fundamentals of Light Microscopy and Electronic Imaging: A book by Doug Murphy & Mike Davidson

9. Evaluation:

Mid-semester Written Examination	:	40% Marks
End-semester Written Examination	:	40% Marks
Quiz / Assignment/Presentation (oral / poster)/other	:	20% Marks