

Lecturers:	Benesh Joseph, Jacek Kozuch, Joachim Heberle
Language:	English
Period:	16.04.2024 - 12.07.2024
Dates:	Lecture: Tue 12:00 - 14:00, Fri 12:00 - 14:00 - 1.3.14, Lecture Hall A Lab course: Thu 12.00 - 18.00
max. number of participants	unlimited
Notes:	10 ECTS only together with practical course (20114101 + 20114130)
Content:	This module will present and substantiate biophysical methods and concepts. Selected methods like spectroscopy and diffraction and their application to proteins, nucleic acids and biomembranes are of particular relevance. The lecture series will cover a selection of the following methods: absorption spectroscopy in the UV, visible and IR region; fluorescence spectroscopy, time-resolved approaches; spectroscopy with linear and circular polarized light; vibrational spectroscopy: Fourier-transform infrared (FTIR), resonance Raman, surface-enhanced Raman and IR; diffraction with X-rays, Neutrons and electrons; crystallization and protein crystallography; nuclear magnetic resonance (NMR); electron paramagnetic resonance, light scattering; single molecule spectroscopy; optical tweezer; atomic force microscopy; theoretical methods: MD simulations, Poisson-Boltzmann, QM/MM
Literature:	Since a comprehensive textbook in Biophysics is not available, here is a list of books from which parts will be used in the lecture: Serdyuk, I.N., Zaccai, N.R. & Zaccai, J: Methods in Molecular Biophysics. Tuszynski & Kurzynski: Introduction to Molecular Biophysics. Cantor & Schimmel: Biophysical Chemistry. Walla: Modern Biophysical Chemistry. Brandén & Tooze: Introduction to Protein Structure. Winter & Noll: Methoden der Biophysikalischen Chemie. Gennis: Biomembranes
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