INTRODUCTION TO BIOPHYSICAL METHODS

FROM BONDS TO BRAINS

MCDB 2200

3 Credit Hours

This course provides a practical overview of modern biophysical method used to study biological systems from whole body imaging methods to methods for investigating single molecules and molecular bonds. The goal of this course is to provide a broad survey of methods available to the modern biologist rather than a complete in-depth treatment of the physics and mathematics of each individual method. The methods to be covered include MRI, PET scan, CT scan, light microscopy, fluorescence microscopy, confocal and multiphoton microscopy, TIRF microscopy, super resolution microscopy, cryo-EM, x-ray crystallography, multidimensional NMR, mass spectrometry, FRET, thermophoresis, DLS, optical trapping force microscopy, FTIR, AFM, and more.

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Biophysical Chemistry Part II. Cantor and Schimmel
(https://www.amazon.com/Biophysical-Chemistry-Part-Techniques-Biological/dp/0716711907)

Introduction to Experimental Biophysics: Biological Methods for Physical Scientists 2nd Edition (EBook PDF) Nadeau.
(https://ebookclass.com/product/introduction-to-experimental-biophysics-biological-methods-for-physical-scientists-2nd-edition-ebook-pdf/)

Biophysics: Tools and Techniques (EBook PDF) M. Leake
(https://kisslibrary.com/book/CE2110C8FE570A614286?utm_source=new-dl-3110-reuse-2&utm_medium=banner&utm_campaign=newtraf&search=Biophysics%3A+tools+and+techniques&x=1003427)

Biophysical Techniques, Iain Campbell
(https://global.oup.com/ushe/product/biophysical-techniques-9780199642144?cc=us&lang=en&)

DATE	TOPIC
	Absorption, fluorescence, light spectroscopy
	Fluorescence resonance energy transfer (FRET)
	multiphoton microscopy
	Total internal reflection microscopy (TIRF)
	Single Molecule Imaging
	PALM, STORM, high resolution methods
	CD and Analytical Ultracentrifugation
	DLS, SEC
	SPR, Thermophoresis
	Computational modeling and simulation
	NMR Spectroscopy
	ESR Spectroscopy
	Optical trapping
	Atomic Force Microscopy
	Patch clamp, electrophysiology
	FTIR
	Mass Spectrometry
	X-ray crystallography
	EM and SPA Cryo-EM