

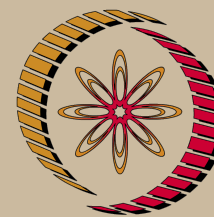
Bioanalytical Techniques and Bioinformatics - Web course

COURSE OUTLINE

Introduction, Modern approaches in Bioanalysis and Bioassays. Spectroscopic techniques: UV-Visible spectroscopy, Fluorescence spectroscopy, IR spectroscopy, CD spectroscopy, and Mass spectroscopy. Light Microscopy; Fluorescence microscopy, Atomic force microscope, Electron microscope, Scanning electron microscope, Transmission Electron microscope. Application of microscope in analyzing biological samples. Electrophoresis; Principle, Design of horizontal and vertical gel electrophoresis apparatus, performing electrophoresis techniques, application of electrophoresis in analyzing macromolecules. Chromatographic techniques; Principles, Column chromatography, HPLC, TLC, Paper chromatography. Computational approaches in analyzing protein and nucleic acid sequences; Analysis of protein structures; Computer aided drug design and screening.

COURSE DETAIL

Sl. No.	Module/ Lecture Topics	No. of (Total) 40 Hours
1	Introduction Introduction, Modern approaches in Bioanalysis and Bioassays	2
2.	Spectroscopic techniques Spectroscopic techniques: UV-Visible spectroscopy, Fluorescence spectroscopy, IR spectroscopy, CD spectroscopy, and Mass spectroscopy	8
3.	Microscopic Techniques Light Microscopy; Fluorescence microscopy, Atomic force microscope, Electron microscope, Scanning electron microscope, Transmission Electron microscope. Application of microscope in analyzing biological samples.	10
4.	Electrophoretic Techniques Electrophoresis; Principle, Design of horizontal and vertical gel electrophoresis apparatus, performing electrophoresis techniques, application of electrophoresis in analyzing macromolecules.	8
5.	Chromatographic Techniques Chromatographic techniques; Principles, Column chromatography, HPLC, TLC, Paper chromatography,	8



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6.	Bioinformatics Tools Computational approaches in analyzing protein and nucleic acid sequences; Analysis of protein structures; Computer aided drug design and screening.	4
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*Mid course examination after module 3 and finals after the completion of module 6.

**Numbers of lectures are tentatively fixed.

References:

1. A. Manz, N. Pamme and D. Iossifidis, Bioanalytical Chemistry, World Scientific Publishing Company, 2004
2. D. Baxevanis, B. F. F. Ouellette, Bioinformatics -A practical Guide to the analysis of Genes and Proteins, 2nd Ed, John Wiley and Sons Inc., 2001.
3. Basic Methods in Microscopy, Protocols and concepts from cells: A Laboratory Manual, D. L. Spector & R. D. Goldman (Editors.), Cold Spring Harbor Laboratory Press, 2006
4. T. Lengauer; Bioinformatics - From Genomes to Drugs, Vols 1 & 2, Wiley-VCH, 2002.
5. Live Cell Imaging: A Laboratory Manual R. D. Goldman, J. R. Swedlow and D. L. Spector Cold Spring.
6. Harbor Laboratory Press; 2nd edition, 2009