AMITY UNIVERSITY

UTTAR PRADESH

L	T	P / S	SW/F W	TOTAL CREDIT UNITS
3	-	-	-	03

Course Title: Biomedical Techniques and Instrumentation

Course Code:
Credit Units: 03

Course Objectives:

The objective of the course is to introduce students to the procedures required to efficiently and effectively utilize the quantitative instrumental analytical instrumentation commonly used in industrial and research laboratories. The course is designed to survey modern bioanalytical chemistry with specific focus on the physical principles and practical aspects of core and emerging bioanalytical techniques.

Pre-requisites: Biophysics and Biochemistry

Student Learning Outcomes:

At the end of the course, the students will be able to

- Have sufficient scientific understanding of the basic concepts in instrumentation used in Medical Biotechnology
- Identify the most useful technique for a given bioanalytical problem,
- Interpret and use the results from a given bioanalytical technique,
- Critically assess advances within the field of bioanalytical chemistry.

Course Contents/Syllabus- Theory:

Module	Weightage(%)
Module I: • Basic Instruments use in clinical sciences (Internal utility and external utility) , Biocomaptible material and Devices,implantable Devices (pacemakers, urine catheters, cardiac stents, cardiac vakves, contact lenses, artificial heart), Imaging equipments (Ultra sound imaging equipments, X-rays , PET scans)	**20**

Module II: • Microscopy: Principles of construction and uses of compound microscope, phase contrast microscope, fluorescence microscope, polarizing microscope, confocal microscopy, transmission and scanning electron microscope.	**30**
Module III: • General Principles of Protein purification and function analysis techniques: Cell disruption for isolation, general steps of protein purification; determination of protein concentration, Determination of amino acid sequence (Edman degradation method).	**30**
Module IV: Radioisotope Techniques: Detection and measure of radioactivity, Liquid scintillation counting and quenching, overview of autoradiography and Radioimmunnoassay (RIA).	**20**

Pedagogy for Course Delivery:

Lectures: 39
Tutorial: 0
Presentation/ Seminar:4
Class Test: 2
Total: 45

Lab/ Practical details, if applicable: NA

Assessment/ Examination Scheme:

Theory L/T (%)	Lab/Practical/Studio (%)	End Term Examination
100	**0**	**100**

Theory Assessment (L&T):

Continuous Assessment/Internal Assessment						End Term Examination
Components (Drop down)	**Class Test 1**	**Class Test 2**	**Home Assignment**	**Presentation/ Seminar**	**Attendance**	
Weightage	5	10	5	5	5	70

(%)						

Lab/ Practical/ Studio Assessment: NA

Text & References:

- Principles and Techniques of Biochemistry and molecular Biology, Sixth edition, KeithWilson and John Walker, Cambridge low price editions. ISBN: 9780521731676
- Biophysical Chemistry; applications to Biochemistry and Molecular Biology, By David Freifelder, 1982, ISBN: 9780716714446