

SARDAR PATEL UNIVERSITY
Programme: MSC (Integrated Biotechnology)
Semester: VI
Syllabus with effect from: December 2012

Paper Code: PS06CIGB05	Total Credits: 3
Title Of Paper: Bioanalytical Techniques	

Unit	Description in detail	Weightage (%)
1	UV – Visible Absorption Spectroscopy: Introduction of instrumental methods and its classification. Introduction to UV – Visible Absorption Spectroscopy, Absorption laws Beer’s-Lambert’s law, its Principle, Applications and limitations. Types of transitions, Instrumentation, Chromophoric effect, auxochromic effect, Bathochromic effect and Hypsochromic effect.	
2	Spectroscopy: Introduction, Principle, theory, instrumentation, interpretation, applications and limitations of- Infrared Error! Not a valid link. (IR), Electron Spin Resonance (ESR), Atomic Absorption spectroscopy (AAS) and Atomic Emission Spectroscopy (AES).	
3	Principle, Instrumentation and Biophysical methods used for analysis of biopolymer structure; Fluorescence, Mass Spectroscopy, MALDI-TOF, ORD/CD. Nuclear Magnetic Resonance Spectroscopy (Proton NMR) (Chemical shift, Spin-spin coupling constant, Shielding and de-shielding).	
4	Radioanalytical methods and its applications: General introduction Radiation detection, Radiometric titration, Isotopic dilution method (IDM), Reverse isotopic dilution method (RIDM) Nuclear active analysis (NAA), Radioimmunoassay, Radio ligand assay. Autoradiography	
	Practical:	
	<ul style="list-style-type: none"> • Determination of Lambda max using a dye sample • Determination of partition co-efficient value of a dye by spectrophotometry • Beer’s-Lambert law for selection of linearity range in protein estimation • Interpretation of Mass spectra of a biological compound • Comparative study of biological sample using IR spectra • Sample preparation for IR spectroscopy • Sample preparation transmission electron microscopy. • Interpretation of chemical shift using NMR spectra of a biological compound. 	

Basic Text & Reference Books:

- Principles of Instrumental Analysis: Douglas A Skoog, F. James Holler and Timothy A. Nieman, Harcourt Brace College Publishers.
- Biophysical Chemistry (Principles and Techniques) Upadhaya, Upadhaya & Nath, Himalaya Publishing House Pvt. Ltd. 4th eds. 2008
- Quantitative analysis of pharmaceuticals formulations: Sethi PD (1996), CBS Publishers and Distributors. (ISBN 81-239-0439-8)
- Instrumental Methods of Analysis: Willard, Merritt, Dean and Settle, CBS Publishers & Distributors. (ISBN 81-239-0943-8).



- Instrumental methods of chemical analysis: Chatwal and Anand, Himalaya Publishing House Pvt. Ltd. 5th eds. (ISBN 978-81-8318-802-9)
- Physical Biochemistry Principles and techniques of practical biochemistry and Molecular Biology: Wilson & Walker, Cambridge University Press, Cambridge, 6th eds. 2005. (ISBN 0-521-69180-X).
- Physical Biochemistry Applications to Biochemistry and Molecular Biology: David Freidfelder, W. H. Freeman and company NewYork, 2nd eds. 1982. (ISBN 0-7167-1444-2 (pbk.)

