

SARDAR PATEL UNIVERSITY
Programme: MSc (Genetics)
Semester: I
Syllabus with effect from: June 2010

Paper Code: PS01CGEN03	Total Credits: 4
Title Of Paper: Bioanalytical Techniques	

Unit	Description in detail	Weightage (%)
1	Microscopy: Basic principles and instrumentation, light microscopy, Phase contrast microscopy, fluorescence microscopy, Confocal microscopy. Electron Microscopy: Transmission and Scanning Electron Microscopy, Tunneling Electron Microscopy, Atomic Force Microscopy.	25 %
2	Chromatography: Introduction, classification of separation methods, Principles, methodology and applications of chromatography: Paper, Thin layer, High Performance thin layer, column (gel filtration, ion exchange and affinity), HPLC, and GC.	25 %
3	Electrophoresis: Introduction, Gel matrices – Polyacrylamide & Agarose, applications of electrophoresis for Proteins: PAGE – Native & SDS, Gradient gel, Two dimensional electrophoresis – IEF and Nucleic acids (DNA & RNA): Pulse-field gel electrophoresis, Electrophoresis of DNA & RNA. Centrifugation: Principles & types, simple & differential, density gradients, ultracentrifugation-preparative & analytical.	25 %
4	UV – Visible Absorption Spectroscopy: Lambert, Beer’s law, limitations and applications. requirement of UV – Visible Absorption Spectroscopy, Chromophoric effect, auxochromic effect, Bathochromic effect and Hypsochromic effect; Instrumentation. Spectroscopy: Introduction, Principle, theory, instrumentation and applications of Infrared Spectroscopy (IR), Nuclear Magnetic Resonance Spectroscopy (Proton NMR), Electron Spin Resonance (ESR), Atomic Absorption spectroscopy (AAS), Fluorescence.	25 %

Basic Text & Reference Books:

- Instrumental Analysis: Douglas A Skoog, F. James Holleer and Timothy A. Nieman, Saurabh Printers Pvt, Ltd, 3rd eds. 2009. (ISBN – 13:978 – 81 – 315-05427
- 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 New York, 2nd eds. 1982 (ISBN – 07167 – 1444 – 2 (pbk.))
- Introduction to instrumental analysis, Robert D. Braun, Aditya Art Printers, Hyderabad. (ISBN – 81 – 8849-15-6)
- Analytical Biochemistry by D.J. Holme & H. Peck, 3rd edition, 1998. Pearson Education, New Delhi.
- Microscopy and Micro – technique: R. Marimuthu, MJP Publishers, Chennai ISBN:978-8180940354

