

SARDAR PATEL UNIVERSITY
Programme: BSC (GENETICS)
Semester: V
Syllabus with effect from: June 2013

Paper Code: US05CGEN01	Total Credit: 3
Title Of Paper: Instrumental Methods of Analysis	

Unit	Description in detail	Weighting (%)
1	MICROSCOPY Microscope: Definition. Properties of Light (Def. of Wavelength, Frequency, Amplitude, Polarization, Diffraction, Refraction, Magnification, Resolution) Compound microscope, Phase contrast microscope, Fluorescent microscope and Electron microscope (SEM & TEM), Tissue processing for electron microscope.	
2	CENTRIFUGATION AND SPECTROSCOPY Basic principle of sedimentation – Relative centrifugal force (RCF), Sedimentation rate, Svedberg unit or Sedimentation coefficient, Types of Centrifugation: Analytical and Preparative, Differential, Density gradient, Types of Centrifuge & rotors. Overview of Electromagnetic radiation, Laws relating to absorption of radiation. Principle, Instrumentation and Applications of Colorimeters, Spectrophotometers – Ultraviolet and Visible Absorption Spectroscopy.	
3	CHROMATOGRAPHY Principles of Chromatography (Distribution Coefficient), Types of Chromatography: Principles, Instrumentation and applications of - Thin Layer Chromatography (TLC), Column Chromatography, Ion-Exchange Chromatography, Affinity Chromatography, Gel permeation Chromatography, GLC, High Performance Liquid Chromatography (HPLC)	
4	ELECTROPHORESIS Gel Electrophoresis: General Principles, Agarose gel electrophoresis, SDS-PAGE, Pulse Field Gel Electrophoresis (PFGE), Isoelectric Focussing, Capillary Electrophoresis.	

Basic Text & Reference Books:

- Handbook of Analytical Instruments - Khandpur, R. S. 2nd Ed, Tata McGraw Hill Publication.
- Bioinstrumentation.- L. Veerkumari, MJP Publishers
- Principles and Techniques of Biochemistry and Molecular Biology- Wilson, K., & Walker, J. Cambridge University Press
- Biophysical Chemistry - Upadhyay & Upadhyay, Himalaya Publishers.
- Introduction to biophysics - Pranab Kumar Banerjee, S. Chand & Company Ltd.
- Modern Experimental Biochemistry - Rodney Boyer, Benjamin & Cummings.

