

# Analytical Technologies in Biotechnology - Video course

## COURSE OUTLINE

Microscopy- Radioisotope techniques-Chromatographic methods-Electrophoresis-Centrifugation techniques-Spectroscopic Techniques- Polymerase Chain Reaction(PCR), DNA sequencing, ELISA.

## COURSE DETAIL

S.No.	Topics and contents	Number of Lectures
1	Microscopy- Dark-field, Phase contrast, Fluorescence, Confocal, Polarization microscopy; Electron microscopy: TEM & SEM.	6
2	Radioisotope techniques- Basic concepts, GM and scintillation counter, autoradiography, RIA, Applications in biological science.	5
3	Chromatographic methods- General principles, Ion exchange, Gel filtration, Affinity and Gas chromatography techniques.	6
4	Electrophoresis- General principles, Horizontal & Vertical Gel electrophoresis, Isoelectric focusing, 2D, Pulse field and immuno, electrophoresis.	7
5	Centrifugation techniques- Basic principles, Different types of	



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## Biotechnology

### Pre-requisites:

A course on Biochemistry and Biophysics.

### Additional Reading:

Selected Research Papers.

### Coordinators:

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	principles, Different types of centrifuges, Analytical and Preparative Ultracentrifugation methods.	6
6	Spectroscopic Techniques- Electromagnetic radiations; UV-Visible, fluorescence, CD, NMR, X-ray, Atomic absorption and Flame emission spectroscopic techniques, Mass spectrometry.	7
7	Polymerase Chain Reaction, DNA sequencing, ELISA.	3
	<b>Total number of lectures</b>	<b>40</b>

### References:

1. Wilson K and Walker J "Principles and Techniques of Biochemistry and Molecular Biology" 6th Ed. Cambridge University Press, 2005.
2. Willard, H.H., Merritt L.L. Dean J.A. and Settle F.A., "Instrumental Methods of Analysis", 7th Ed., Wadsworth Publishing Co., 1986.
3. Van Holde, K E, Johnson, W. and Ho, P. S., "Principles of Physical Biochemistry", Prentice Hall, 1981.
4. Cantor, C. R. and Schimmel, W.H., "Biophysical Chemistry Part-II", Freeman & Co., 1981.
5. Campbell, I.D. and Dwek, R. A., "Biological Spectroscopy", Benjamin Curmmings Publication Co. Inc., 1984.
6. Glasel, J. and Deutscher, M. B., "Introduction to Biophysical Methods for Protein and Nucleic acid Research", Academic Press, 1995.
7. Physical chemistry by D. Friedfelder WH Freeman and co., 1982.