



**Swami Shraddhanand College
(University of Delhi)**

Alipur, Delhi- 1100036

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Lesson Plan

Name of Teacher	Dr. Ekta Singh (1 Period/Week) Dr. Narendra Sharma (3Period/Week)	Department	Botany
Course	B.SC.(H)	Semester	V
Paper	Analytical Techniques in Plant Sciences	Academic Year	2023-2024
Learning Objectives			
To gain the knowledge on various techniques and instruments used for the study of plant biology.			
Learning Outcomes			
This course will impart basic knowledge on: Understanding of principles and use of light, confocal transmission and electron microscopy, centrifugation, spectrophotometry, chromatography, x-ray diffraction technique and chromatography techniques.			

Lesson Plan

Week No.	Theme/ Curriculum
1. (16 th -20 th Aug 23)	Centrifugation: Differential and density gradient centrifugation, sucrose density gradient. (Dr. Narendra Sharma)
2. (28 th -3 th Sept 23)	Principles of microscopy; Light microscopy. (Dr. Ekta Singh) CaCl ₂ analytical centrifugation gradient, ultracentrifugation, marker enzymes. (Dr. Narendra Sharma)
3. (4 th -10 th Sept 23)	Fluorescence microscopy; Confocal microscopy. (Dr. Ekta Singh) Radioisotopes its use in biological research, auto-radiography. (Dr. Narendra Sharma)
4. (11 th -17 th Sept 23)	Use of fluorochromes: (a) Flow cytometry (FACS); (b) Applications of fluorescence microscopy. (Dr. Ekta Singh) Pulse chase experiment. Principle of Spectrophotometry. (Dr. Narendra Sharma)
5. (18 th -24 th Sept 23)	Chromosome banding, FISH, chromosome painting. (Dr. Ekta Singh) Principle of Paper chromatography and Column chromatography. (Dr. Narendra Sharma)
6. (25 th -1 st Oct 23)	Transmission electron microscopy. (Dr. Ekta Singh) TLC, GLC, HPLC. (Dr. Narendra Sharma)
7. (2 nd -8 th Oct 23)	sample preparation for electron microscopy for TEM. (Dr. Ekta Singh) Ion-exchange chromatography. (Dr. Narendra Sharma)
8. (9 th -15 th Oct 23)	Scanning electron microscopy. (Dr. Ekta Singh) Molecular sieve chromatography and Affinity chromatography. (Dr. Narendra Sharma)
9. (16 th -22 nd Oct 23)	sample preparation for electron microscopy for SEM. (Dr. Ekta Singh)

	Mass spectrometry. (Dr. Narendra Sharma)
10. (23 th -29 th Oct 23)	cryofixation, negative staining. (Dr. Ekta Singh) X-ray diffraction; X-ray crystallography. (Dr. Narendra Sharma)
11. (30 th -5 th Nov 23)	shadow casting. (Dr. Ekta Singh) Characterization of proteins. (Dr. Narendra Sharma)
12. (6 th - 12 th Nov 23)	freeze fracture, freeze etching. (Dr. Ekta Singh) Characterization of nucleic acids. (Dr. Narendra Sharma)
13. (13 th - 19 th Nov 23)	Electrophoresis: AGE, PAGE (Dr. Narendra Sharma)
14. (20 th -26 th Nov 23)	Internal Assessment Test
15. (27 th -3 rd Dec 23)	Electrophoresis: SDS-PAGE. (Dr. Narendra Sharma)
16. (4 th -6 th Dec 23)	Revision of all the topics
Suggested Readings	
Books	1. Plummer, D.T. (1996). An Introduction to Practical Biochemistry, 3rd edition. New Delhi, Delhi: Tata McGraw-Hill Publishing Co. Ltd. 2. Ruzin, S.E. (1999). Plant Microtechnique and Microscopy. New York, NY: Oxford University Press.
Online Resources (If Any)	
Assignment and Class Test Schedule for Semester	
Assignments: Submission by 15th November 2023	
Class Test: On the date as notified by the College	