

Programme: M.Sc. Botany

Course Code: BOO-122

Title of the Course: Lab in Techniques and Instrumentation in Botany

No. of Credits: 1

Effective from AY: 2020-21

Prerequisite for course	Knowledge of chemistry, biochemistry, instrumental techniques at UG level	
Objective	Understanding of basic principles and phenomena in the area of techniques and instrumentation required for biological studies. The course will provide opportunity to learn theoretical and practical preparation and enabling students to operate and maintain instrumentation, develop methods and carry out given scientific protocol and develop ability in students to scientific and analytical reasoning.	
Content	1. Preparation of molar and other solution and setting of pH.	2 hours
	2. Absorption spectra of various compounds to understand λ max, substance absorption.	2 hours
	3. Verification of Beer's law.	2 hours
	4. pKa value of a buffer/ amino acids using pH meter.	2 hours
	5. IEF* (learning of gel formation and role of various components.)	2 hours
	6. SDS-PAGE of membrane proteins (learning of gel formation, etc.).	2 hours
	7. Analysis of gel.	2 hours
	8. Blotting.	4 hours
	9. Separation of organelles based on density gradient centrifugation (Using percoll or sugar gradient).	2 hours
	10. TLC for separating and identifying biomolecules.	2 hours
	11. GC*	2 hours
	12. Fluorescence spectrophotometry.	2 hours
	13. HPLC*.	2 hours
	14. Flame photometry.	2 hours
	15. Atomic absorption spectrophotometry*.	2 hours
	16. Scintillation counter*.	2 hours
	17. Centrifuges and rotor heads	2 hours
	*Demonstration only	
Reading/ reference	<ol style="list-style-type: none">1. Bates R.G. Determination of pH: Theory and Practices, 2nd Ed. John Wiley, New York.2. Brech F. Analysis in instrumentation. Vol. 6. Plenum, New York.3. Dixon R.N. Spectroscopy and Structure. Mathuen, London4. Giddings J.C. Principles and Theory, Dynamics of Chromatography Part I Dekker, New York.5. Grob R.L. Modern Practices of Gas Chromatography. 2nd Ed. John Wiley, New York.6. Guilbault G.G. Practical Fluorescence: Theory, methods and	

	<p>Techniques. Dekker, New York.</p> <p>7. Hames B.D. and Rickwood D. Gel electrophoresis of Proteins: A practical approach 2nd ed. IRL Press, Oxford.</p> <p>8. Karp, G. (2009). Cell and molecular biology: Concepts and experiments, 7th edition. John Wiley & Sons, USA.</p> <p>9. Kolthoff I.M. and Elving P. J. Treatise on analytical Chemistry, Wiley Interscience, New York.</p> <p>10.Sharma, B.K. Principal of analytical chemistry, Meerut Publication, Meerut.</p> <p>11.Simpson C.F. Techniques in liquid chromatography, Wiley-Heyden, New York. Horvath C. HPLC Vol.I Academic Orlando. F.L. Fritz J.S., GjerdeD.T. and Pohlandt C. Ion chromatography, A. Huthig, Heidelberg</p> <p>12.Varcoe J. S. Clinical Biochemistry: Techniques and instrumentation. A practical Approach. RMIT, Australia.</p>	
Learning Outcome:	<p>This Course will impart skill to students to be able to work in R & D and quality control laboratories in government and private organizations. Students should also be able to use modern instrumentation and classical techniques.</p>	