Programme: M. Sc. Biotechnology

Course Code: GBC-192 **Title of the Course:** Lab II - Biochemical & Analytical Techniques

Number of Credits: 3

Effective from AY: 2019-2020

Prerequisites for the course:	No prerequisites required.	
Objective:	The objective of this laboratory course is to introduce students to experimentation in biochemistry. The course is designed to teach the utility of these experimental methods in a problem-oriented manner.	
Content:	1. Principles of colorimetry and experimental significance of the Beer-lambert Law 2. Estimation of proteins by the Lowry's method 3. Spectral characteristics of coloured solutions and UV absorption of proteins 4. Estimation of reducing sugars. 5. Titration curves of di- and tri- protic amino acids 6. Paper chromatography. 7. Ammonium sulphate precipitation and dialysis 8. Protein subunit molecular weight determination by SDS-PAGE 9. Column chromatographic techniques 10. Analysis of a biological specimen by SEM 11. Fluorescence microscopy 12. Demonstration of fluorescence spectroscopy 13. Demonstration of mass spectrometry 14. Demonstration of FT-IR/XRD	72 hours
Pedagogy:	lectures/ tutorials/assignments/self-study	

References/Readings	1. Modern Experimental Biochemistry (2003). Boyer, R. Principles and Techniques of Biochemistry and MolecularBiology (2005). Wilson, K. & Walker, J. 2. An Introduction to Practical Biochemistry.(2005). Plummer,D.T. Laboratory Manual of Biochemistry.(1998). Jayaraman, J. 3. Physical Chemistry: Principles and Applications in the Biological Sciences. Tinoco, Sauer, Wang, and Puglisi. (2013) Prentice Hall, Inc. 4. Physical Chemistry for the Life Sciences (2nd Edition). Atkins, de Paula. (2015) 5. Bioanalytics: Analytical Methods and Concepts in Biochemistry and Molecular, Friedrich Lottspeich, Joachim W. Engels, (2018). Wiley-VCH publisher. 6. Laboratory Protocols in Applied Life Sciences, (2014), Prakash S. Bisen, Taylor and Francis Publisher	
Learning Outcomes	Students should be able to: • elaborate concepts of biochemistry with easy-to-run experiments. • familiarize with basic laboratory instruments and understand principles underlying measurements using those instruments for experiments in biochemistry.	

Programme: M. Sc. Biotechnology

Course Code: GBC-193 **Title of the Course:** Lab III - Molecular Biology & Genetic Engineering

Number of Credits: 3

Effective from AY: 2019-2020

Prerequisites for the course:	No prerequisites required.	
Objective:	The objectives of this course are to provide students with the experimental knowledge of molecular biology and genetic engineering.	