

**Programme: M.Sc. Marine Biotechnology**

**Course code: MBO 192**

**Title of the course: LAB II - BIOCHEMICAL & ANALYTICAL TECHNIQUES**

**Number of credits: 3**

**Effective from: 2019-2020**

<b>Course Objectives</b>	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.	
<b>Learning Outcomes</b>	<p>Students should be able to:</p> <ul style="list-style-type: none"><li>• Elaborate concepts of biochemistry with easy-to-run experiments.</li><li>• Familiarize with basic laboratory instruments and understand principles underlying measurements using those instruments for experiments in biochemistry.</li></ul>	
<b>Contents</b>	<ol style="list-style-type: none"><li>1. Principles of colorimetry and experimental significance of the Beer-lambert Law</li><li>2. Estimation of proteins by the Lowry's method</li><li>3. Spectral characteristics of coloured solutions and UV absorption of proteins</li><li>4. Estimation of reducing sugars.</li><li>5. Titration curves of di- and tri- protic amino acids</li><li>6. Paper chromatography.</li><li>7. Ammonium sulphate precipitation and dialysis</li><li>8. Protein subunit molecular weight determination by SDS-PAGE</li><li>9. Column chromatographic techniques</li><li>10. Analysis of a biological specimen by SEM</li><li>11. Fluorescence microscopy</li><li>12. Demonstration of fluorescence spectroscopy</li><li>13. Demonstration of mass spectrometry</li><li>14. Demonstration of FT-IR/XRD</li></ol>	72 hours
<b>References/ Reading</b>	<ol style="list-style-type: none"><li>1. Modern Experimental Biochemistry (2003). Boyer, R.</li><li>2. Principles and Techniques of Biochemistry and Molecular Biology (2005). Wilson, K. &amp; Walker, J.</li><li>3. An Introduction to Practical Biochemistry.(2005). Plummer,D.T.</li><li>4. Laboratory Manual of Biochemistry.(1998). Jayaraman, J.</li><li>5. Physical Chemistry: Principles and Applications in the Biological Sciences. Tinoco, Sauer, Wang, and Puglisi. (2013) Prentice Hall, Inc.</li></ol>	

	<p>6. Physical Chemistry for the Life Sciences (2nd Edition). Atkins, de Paula. (2015)          Bioanalytics: Analytical Methods and Concepts in Biochemistry and Molecular, Friedrich Lottspeich, Joachim W. Engels, (2018). Wiley-VCH publisher.</p> <p>7. Laboratory Protocols in Applied Life Sciences, (2014), Prakash S. Bisen, Taylor and Francis Publisher</p>	
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