

**Name of the Program: M.Sc. Marine Microbiology**

**Course Code: MMI-509**

**Title of the Course: Techniques and Instrumentation in Microbiology - Practical**

**Number of Credits: 01**

**Effective from AY : 2022 - 23**

<b>Prerequisites for the course:</b>	The student should be familiar with the concepts in basic chemistry and should be able to use basic instruments in Microbiology.	
<b>Objective:</b>	This course develops the skills for techniques and instrumentation in microbiology.	
<b>Content:</b>	1. Microscopy – compound, phase contrast – of bacterial, fungal cells (3 hrs; Ref 1) 2. Density gradient separation of mixed bacterial and/or yeast cells. (3 hrs; Ref 1) 3. Cell disruption of pigmented bacteria/yeast by sonicator, efficacy of sonication and pigment profiling using UV-visible spectrophotometer. (9 hrs; Ref 1-5) 4. Polyacrylamide gel electrophoresis (PAGE) (12 hrs; Ref 1-5) 5. Demonstration of molecular exclusion chromatography (3 hrs; Ref 5)	30 hrs
<b>Pedagogy:</b>	Experiments in the laboratory	
<b>References/ Readings:</b>	1. Wilson, K. and Walker, J. (2013). Principles and Techniques of Biochemistry and Molecular Biology, Cambridge University Press, N.Y., USA. 2. Cooper, T. G. (2011). The Tools of Biochemistry, Wiley India Pvt. Ltd., Noida. 3. Goswami, C., Paintal, A. and Narain, R. (2011). Handbook of Bioinstrumentation, Wisdom Press, New Delhi. 4. Parakhia, M. V., Tomar, R. S., Patel, S. and Golakiya, B. A. (2010). Molecular Biology and Biotechnology: Microbial Methods, NIPA New Delhi, Pitampura. 5. Jayaraman, J. (2011). Laboratory Manual in Biochemistry, New Age International Publishers, New Delhi.	
<b>Course Outcomes:</b>	1. Demonstrate microbial cells, under the microscope. 2. Analyse separation of microbes based on their cell densities. 3. Employ cell disruption technique and UV-visible spectrophotometry for intracellular pigment profiling. 4. Analyze proteins using polyacrylamide gel electrophoresis. 5. Learn separation of biomolecules using molecular exclusion chromatography.	