

Name of the Program: M.Sc. Marine Microbiology

Course Code: MMI-511

Title of the Course: Industrial Microbiology - Practical

Number of Credits: 01

Effective from AY : 2022 - 23

Prerequisites for the course:	Knowledge of basic microbiology techniques.	
Objective:	This course develops the skills for techniques and instrumentation in industrial microbiology.	
Content:	1. Fermentor design – stirred tank reactor. (6 hrs, Ref. 1) 2. Rheology of substrate solutions using viscometer. (6 hrs, Ref.2) 3. Exopolysaccharide production using marine microbial isolate. (6 hrs, Ref.3) 4. Downstream processing for EPS. (6 hrs, Refs 1 and 2) 5. Culturing <i>Spirulina</i> (<i>Arthrospira platensis</i>). (6 hrs, Refs 4 and 5).	30 hrs
Pedagogy:	Experiments in the laboratory, data collection and processing.	
References/ Readings:	1. Flickinger, M.C. and Drew S.W. (2002). The Encyclopedia of bioprocess technology: fermentation, biocatalysis and bioseparation. Volumes 1 – 5. John Wiley Publisher, New Jersey. 2. Stanbury, P.F., Whitaker, A. and Hall, S.J. (2016). Principles of fermentation technology. 3 rd Edition. Butterworth-Heinemann Publishers, Oxford, U.K. 3. Arad, S.M. (1999). Polysaccharides from red microalgae. In Chemicals from microalgae. Cohen Z (Ed). Taylor and Francis, London, pp 282-292. 4. https://www.justspirulina.org/spirulina-growing-requirements 5. Habib, M.A.B., Parvin, M., Huntington, T.C., and Hasan, M.R. (2008). A review on culture, production and use of spirulina as food for humans and feeds for domestic animals and fish. FAO Fisheries and Aquaculture Circular. No. 1034. Rome, FAO.	
Course Outcomes:	1. Describe Fermentor design, draw and label different parts of stirred tank reactor. 2. Measure and calculate rheology of substrate solutions using viscometer. 3. Extract and quantitate the exopolysaccharide produced using marine microbial isolate.	

	4. Designing large scale fermentation process for culturing <i>Spirulina</i> and assessing its purity by microscopy.	
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