

Programme: M. Sc. (Marine Sciences)

Course Code: MSO 371 **Title of the Course:** Marine Microbial Ecology I

Number of Credits: 03

Effective from AY: June 2018-19

Prerequisites for the course:	Students who have undergone courses of Semester I and II of Marine Sciences.	
Objective:	To provide basic information and concepts of marine microbiology and its importance. Further, also enables identification of microbes from the marine environments.	
Content:	Marine Microbiology its importance, existence and need; History of marine microbiology; Instruments and sampling methods; Modern methods; Microbial habitats and major types (producers, consumers, symbionts, probionts, etc.) in relation to their habitats; Evolution of sampling strategies and methods for assessment of microbial biodiversity .	12 hours
	Characteristics of marine microbes; Distribution and abundance and their adaptations to pressure, depth, salt, temperature; Integrated effects of nutrient dynamics; Chemosynthesis and microbial heterotrophic metabolism ; Effect of ions of major and trace elements; Toxicity and mechanism of tolerance in marine microbes; Biochemical characterization of marine prokaryotes.	12 hours
	Microbial role in cycling of N, P, S, and C; Concept of microbial loop in relation to marine food web dynamics ; Role of micro-organisms in DOM production and consumption; Microbial mineralization and oxidation of organic matter; Role of marine microbes in production of RDOC and sequestering of carbon dioxide; Pollution indicator and pathogenic marine microbes.	12 hours
Pedagogy:	lectures/ tutorials/assignments/self-study	

References/ Readings	<ol style="list-style-type: none">1. Microbial Ecology of the oceans (2nd Edition), 2010 - Kirchman, D. L., John Wiley & Sons. 616 pages2. Marine Microbiology (2nd Edition), 2011 - Munn, C. Garland Science. 320 pages3. Marine Microbial Diversity: the key to Earth's habitability, 2005 - Hunter – Cevera, J. Karl, D. and Buckley, M., American Academy of Microbiology.4. Biological Oceanography, 2012 - Meller, C. B. and Wheeler P.A.. Wiley – Blackwell Publishers.5. Marine Microbiology: Ecology and Applications (2nd edition), 2011 - Munn, C. Garland Science, Taylor and Francis group, NY.6. Taxonomic scheme for the identification of marine bacteria, 1982 - Oliver, J. D., Deep Sea Research Part A., Oceanographic Research Papers, 29 (6); 795 – 798.7. Marine Ecological Processes (2nd edition), 1995 - Valiella I., Springer – Verlag, New York.	
Learning Outcomes	Develop and provide information on the marine microbial ecology and enables applications of microbiology to understand ecological processes.	