Title of the Course: MARINE MICROBIAL INTERACTIONS [P]

Course Code: MIC-608

Number of Credits: 1, Practical

Contact hours: 30

Effective from Academic Year: 2022-2023

Prerequisites	Students must have a background about the basic concepts of Marine Microbiology, and the techniques involved for sampling and processing of water, sediment, flora and fauna from the marine environment.	
Objective:	This Course emphasizes the techniques used to study the interactions between microorganisms and marine organisms, and also screening of enzymes for degradation of litter.	
Content:		**(30)**
1.	Determining *E. coli* in shellfish –MPN/ EC-MUG medium.	
2.	Isolation of luminescent bacteria from fish/shellfish.	
3.	Assessment of the microbiological quality of marine water in aquaculture: – physicochemical parameters. – potential pathogens.	
4.	Screening of enzymes involved in deterioration of wood/litter in marine environments.	
5.	Examine the beneficial effect of microbial association- Macro algae - Bacteria Isolation and identification of marine algae associated bacteria Isolation and identification of Zooplankton associated bacteria Associated bacterial efficiency for chitin degradation	
Pedagogy:	Experiments in the laboratory	
References/ Readings	Grasshoff, K., Ehrhardt, M. and Kremling, K., Methods of Seawater Analysis, Verlag Chem., Weinheim. (1999)	
	Gatesoupe, F. J., The use of probiotics in aquaculture, Aquaculture, 180: 147-165. (1999)	
	Maier, R., Pepper, I. and Gerba, C., Environmental Microbiology, Academic Press. (2008)	
	Munn, C., Marine Microbiology: Ecology and Applications, Garland Science, Taylor and Francis, N.Y. (2003)	
	Nybakken, J. W. and Bertness, M. D., Marine Biology: an Ecological Approach, Benjamin Cummings, San Francisco, N.Y. (2005)	
	Parsons, T. R., Maita, Y. and Lalli, C. M., Manual of Chemical and Biological Methods for Seawater Analysis, Pergamon Press, New York. (1984)	
	Sharma, P. D., Environmental Microbiology, Alpha Science. (2005)	
	Sindermann, C. J., Principal Diseases of Marine Fish and Shellfish: Diseases of Marine Fish, Vol. 1, Gulf Professional Publishing. (1970)	
	Strickland, J. D. H. and Parsons, T. R., A Manual of Seawater Analysis, Queen's Printer and Controller of Stationery, Ottawa. (1972)	
	Toranzo, A. E., Magarinos, B. and Romalde, J. L., A review of the main	

	bacterial fish diseases in mariculture systems, Aquaculture, 246(1): 37-61. (2005)	
	Intergovernmental Oceanographic Commission, Protocols for the Joint Global Ocean Flux Study (JGOFS) Core Measurements. DOI: https://doi.org/10.25607/OBP-1409 Intergovernmental Oceanographic Commission Manuals and Guides : 29 -JGOFS Report; 19 (1994)	
Course Outcomes	● To isolation of marine organisms associated bacteria ● To analyse the bacterial diseases of fish ● To evaluate the marine organism associated bacteria for beneficial biomolecules	