Programme: M.Sc. (Marine Microbiology)
Course Code: MMO 314
Title of the Course: ANALYSIS OF MICROBIAL PATHOGENS IN THE MARINE ENVIRONMENT
Number of Credits: 1
Effective from Academic Year: 2020-21

Prerequisites	It is required that students have basic knowledge about marine environment, climate change, pollutants in marine environment and basic microbiology techniques.	
Objective:	This course develops concepts in protocols/ strategies for characterization of pathogenic organisms from the marine environment and for determining the efficacy of sanitizers used in aquaculture.	
Content:		**24 H**
1.	Detection of different indicator and pathogenic organisms from marine environments such as *S. aureus, E. coli, V. cholerae, Salmonella, Shigella*, by conventional and rapid methods.	
2.	Characterization of pathogenic isolates - determination of salinity tolerance and antibiotic resistance.	
3.	Testing the efficacy of aquaculture sanitizer (phenol).	
Pedagogy:	Experiments in the laboratory	
References/ Readings	1.Hester, R. E., Harrison, R. M., Marine Pollution and Human Health, Vol. 33, Issues in Environmental Science and Technology, Royal Society of Chemistry. 2.Belkin, S. and Colwell, R. R., Oceans and Health: Pathogens in Marine Environment. Springer Publishers. 3.Noga E. J., Fish Disease: Diagnosis and Treatment, Wiley-Blackwell Publishers. 4.Rheinheimer, G., Aquatic Microbiology, John Wiley Publishers. 5.Clark, R. B., Frid, C., Attrill, M., Marine Pollution, Oxford University Press. 6.Wedemeyer, G. A., Meyer, F. P. and Smith, L., Environmental Stress and Fish Diseases, TFH Publications, Neptune, New Jersey. 7.Buller, N. B. and Plumb, J. A., Bacteria from Fish and Other Aquatic Animals: A Practical Identification Manual, CABI Publishing.	
Learning Outcomes	1) Students will learn to quantify and characterize bacterial pathogens and compare against relevant standard guidelines. 2) They will be able to formulate effective strategies for monitoring aquaculture systems.	