Programme: M.Sc. (Marine Microbiology)

Course Code: MMO 118

Title of the Course: FISHERY MICROBIOLOGY [T]

Number of Credits: 3

Effective from Academic Year: 2018-19

Prerequisites	Knowledge of microbial diversity.	
Objective:	Develop the knowledge of fishes, fisheries, aquaculture in India. Develop the concepts of various infectious diseases present in fishes and spread through fishes.	
Content:		
1.		**(15)**
1.1	Type of fishes, shellfishes and other coastal aquatic and marine living resources present in Indian Ocean, Arabian Sea and Bay of Bengal, concept of aquaculture and marine culture of fishes.	
1.2	Microbiology of Raw fish and processed fish, Various methods for processing of fishes; Biopreservation, food processing, fermentation and aquaculture; effect of heat, chilling, freezing and chemical preservatives on bacteria, yeasts and fungi associated with fishes.	
1.3	Quality control and regulations for microbial quality of fishes, shellfish and marine living resources used for food and drugs.	
2.	Bacteria associated with fish and shellfish	**(10)**
2.1	Commensals and pathogens; Classification of diseases; Methods of disease prevention; Detailed study of bacteria pathogenic to finfish and shellfish with emphasis on morphology, epidemiology, pathogenesis, treatment and control:	
	Flavobacterium, Edwardsiella, Vibrio, Aeromonas, Renibacterium, Yersinia, Mycobacterium.	
3.		**(11)**
3.1	Human bacterial pathogens associated with fishes and their products - *Clostridium perfringens, Listeria* spp., *Plesiomonas, Vibrio cholerae, Vibrio parahaemolyticus, Vibrio vulnificus* and common Enterobacteriaceae.	
3.2	Marine toxins – Paralytic Shellfish Poisoning (PSP) Toxins, Amnesic Shellfish Poisoning (ASP) Toxins, Diarrhetic Poisoning Toxins, Lipophilic Shellfish Toxins (LST), Neurotoxin Shellfish Poisoning (NSP) Toxins, Venerupin shellfish poisoning, Ciguatera toxins, tetradotoxins, Azaspiracids, Cyclic Imines and their origin.	

Pedagogy:	Lectures/tutorials/assignments/self-study	
References/ Readings	1. Fernandes, R., Microbiology Handbook: Fish and Seafood, RSC Publishing. 2. Woo, P. and Bruno, D. Fish Diseases and Disorders, Vol 3: Viral, Bacterial and Fungal Infections, CABI Publishers. 3. Roberts, R. J., Fish Pathology, Wiley-Blackwell Publishers. 4. Hoole, D., Buck, D., Burgess, P. and Welby, I., Diseases of Carps and Other Cyprinid Fishes, Wiley-Blackwell Publishers. 5. Post, G., Textbook of Fish Health, TFH Publications. 6. Sindermann, C. J., Principle Diseases of Marine Fish and Shellfish, Gulf Professional Publishing. 7. Noga, E. C., Fish Disease: Diagnosis and Treatment. Wiley-Blackwell Publishers. 8. Leatherland, J. F. and Wook, P. K. T., Fish Diseases and Disorders, CABI Publishers. 9. Wedemeyer, G. A., Meyer, F. P. and Smith, L., Environmental Stress and Fish Diseases, TFH Publications, Neptune, New Jersey. 10. Cunningham, C. E., Molecular Diagnosis of Salmon Disease, Springer Publishers. 11. Plumb, J.A. and Hanson, L.A. Health Maintenance and Principal Microbial Diseases of Cultured Fishes. Wiley-Blackwell Publishers. 12. Buller, N. B. and Plumb, J. A., Bacteria from Fish and Other Aquatic Animals: A Practical Identification Manual, CABI Publishing. 13. de la Maza, L. M., Pezzlo, M. T. and Baron, E. J., Color Atlas of Diagnostic Microbiology, Mosby Publishers. 14. Wadher, B.J. and Bhoosreddy, G.L. Manual of Diagnostic Microbiology. Himalaya Publishing House. 15. Finegold, S.M. and Martin, W.J. Diagnostic Microbiology. Mosby Company, St. Louis, MO. 16. Chakraborty, P. and Pal, N.K. Manual of Practical Microbiology and Parasitology, New Central Book Agency.	
Learning Outcomes	1. Knowledge of wide diversity of marine and coastal ecosystems in terms of fishes, shrimps, etc. 2. Apply the principles of microbiology to a range of interactions between microorganisms and fishes.	