Name of the Programme: M.Sc. Marine Biotechnology

Course Code: MBT 600

Title of the Course: MARINE FOOD TECHNOLOGY

Number of Credits: 2

Effective from AY: 2022-23

Pre-requisites for the Course:	None	
Course Objectives:	The objectives of this course are 1) to teach the principles of food preservation, processing and packaging. 2) quality management practices for food of marine origin.	
Content:	**MODULE I** • Introduction; Importance; Applications of biotechnology in food processing • Preservation and processing – chilling methods, phenomena of rigor mortis, spoilage changes- causative factors; Drying –conventional methods; Salt curing, pickling and smoking; Freezing and cold storage, Canning procedures; Role of preservatives in processing. • Packing – handling fresh fish, frozen packs, individually quick frozen (IQF), layered and shatter packs; Fishery by-products, cannery waste, feeds, silage, fish gelatin, fish glue, chitin and chitosan, pearl essence, fertilizer.	**No. of hours** 15
	MODULE II • Seafood microbiology, factors influencing microbial growth and activity; Seafood borne pathogens: bacteria, fungi, viruses; Spoilage factors in seafood; • Toxins influencing food spoilage; Microbes as food single cell protein (SCP), microbial neutraceuticals. Quality management concepts, planning, system, quality control, quality assurance, quality improvement; • Certification standards – ISO and HACCP; Principles of quality related to food sanitation, contamination, pest control, human resource and occupational hazards; • Novel product development, marketing and sea food export – Marine Products Export Development	15

	Authority (MPEDA), government policies, economic importance; nutrition promotion, consumer studies qualitative and quantitative research methods.	
Pedagogy:	Lectures, tutorials, assignments	
References/ Readings:	1. S. Omura, The search for bioactive compounds from microorganisms. Springer New York, 2011. 2. M. Fingerman, Recent Advances in Marine Biotechnology, Vol. 8: Bioremediation (1st ed.) CRC Press, 2003. 3. G. M. Evans, J. Furlong, G.G. Evans, Environmental Biotechnology: Theory and Application. United Kingdom: Wiley, 2011. 4. T. Fatma, Cyanobacterial and Algal Metabolism and Environmental Biotechnology. India: Narosa, 1999. 5. A.S. Ninawe, K. Rathnakumar, Fish Processing Technology and Product Development. India: Narendra Publishing House, 2008. 6. P. Galvez Raul, Berge Jean-Pascal (Eds.) Utilization of Fish Waste. United Kingdom: CRC Press, 2013. 7. W.C. Frazier, D.C. Westhoff, V.M. Vanitha, Food Microbiology. 5th Edition. McGraw Hill Education, 2017. 8. G.M. Hall, Fish Processing Technology. United Kingdom: Springer US, 2012. 9. D. Kitts, F. Shahidi, Y.M. Jones, Seafood Safety, Processing and Biotechnology. Taylor and Francis. A CRC press book, 2014. 10. K.C. Badapanda, Fish Processing and Preservation Technology. Vol IV NPH Narendra Publishing House, New Delhi, 2012.	
Course Outcomes:	On completion of this course, 1. Students shall learn the application of biotechnological concepts in the processing and production of marine food resources. 2. Students shall get familiarized with the basic techniques of processing, packaging and preserving marine food resources. 3. Students shall gain knowledge regarding various aspects of spoilage of marine foods and the associated seaborne pathogens. 4. Students shall learn about various quality management and regulations associated with marine food products and novel product development.	

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