Name of the Programme: M.Sc. Marine Biotechnology

Course Code: MBT-622

Title of the Course: POTENTIALS OF MARINE BIOTECHNOLOGY

Number of Credits: 2

Effective from AY: 2022-23

Pre-requisites for the Course:	Basic knowledge about Microbiology/Oceanography/Aquaculture	
Course Objectives:	1) To impart knowledge of biotechnological applications of marine organisms, important processes and 2) To impacts on the marine ecosystems and ways to control them.	
Content:		**No. of hours**
	MODULE I • Marine viruses and Giruses • Giant bacteria and their significance • Unculturable bacteria : occurrence ,characteristics and exploitation • Barophilic organisms & their applications • Seaweeds for removal of metal pollutants • GFP, RFP characteristics and their applications • Green mussel adhesive protein • Chitosan : products and applications • Biomimetics	15
	MODULE II • Marine pollution • Biofouling and corrosion • Ballast water • Harmful algal blooms • Bacterial & viral pathogens in aquaculture • Aquaculture diseases and diagnosis	15
Pedagogy:	Lectures, tutorials, assignments	
References/ Readings:	1. S. Ahmed, S. Ikram, Chitosan:Derivatives, composites and applications. Wiley, Scrivener Publishing, 2017. 2. Y. Bar-Cohen, Biomemetics: Biologically Inspired Technologies. CRC Press, 2006. 3. R. Day, M. Davidson, The Fluorescent Protein Revolution. CRC Press, 2014. 4. G. Evams et al., Environmental Biotechnology. John Wiley & sons,	

	Ltd., 2003. 5. Evans et al, Environmental Biotechnology, Theory and Application. Wiley- Blackwell, 2000. 6. H.C. Flemming, P.S. Murthy, R. Venkatesan, K.E. Cooksey. Marine and Industrial Biofouling. Springer, 2009. 7. B. Hicks (Ed.) Green Fluorescent Protein. Humana Press, 2002. 8. Gal Y., Ulber R., & Antranikian G. Marine Biotechnology. Springer, 2005. 9. T. Liengen, R. Basséguy, D. Féron, I.B. Beech, Understanding Biocorrosion. Elsevier Ltd, 2015. 10. C. Munn, Marine microbiology: Ecology & applications. Garland Science, 2011. 11. E. Nabti, Biotechnological Applications of Seaweeds. Springer, 2017. 12. M. Naik, M. Dubey 2017). Marine pollution and microbial bioremediation. Springer. 13. T. Okaichi, Red Tides. Terra Scientific Publishing company, Tokyo and Kluwer Academic Publishers, Boston, 2003. 14. Osborn M. and Smith C., Molecular microbial ecology. Taylor & Francis, 2005 15. T. V. R. Pillay, Aquaculture: Principles and Practices. Blackwell Pub., Oxford, UK, 2001. 16. Rainey F., Oren A. Extremophile Microorganisms and the Methods to Handle Them. Methods in Microbiology. Elsevier, Academic Press, 2006. 17. Swain, P. el al., Fish and Shellfish Immunology. Elsevier, 2006.
Course Outcomes:	On completion of the course, students will 1. be able to comprehend the uses and significance of marine organisms. 2. gain a deep insight about the potential applications of marine organisms in the field of Biotechnology. 3. acquire knowledge about the threats associated with marine bioresources. 4. get an overview about aquaculture diseases and their diagnosis.

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