

**Name of the Programme:** M.Sc. Marine Biotechnology

**Course Code:** MBT-503

**Title of the Course:** LAB II: IMMUNOLOGY AND MARINE PATHOGENESIS

**Number of Credits:** 2

**Effective from AY:** 2022-23

<b>Pre-requisites for the Course:</b>	No prerequisite is required.	
<b>Course Objectives:</b>	This course involves 1) learning techniques to identify reactions in the lab that form the basis for application in immunodiagnostics 2) to gain an insight into the evaluation of marine pathogens.	
<b>Content:</b>	1. Determination of antibody titer using the double immunodiffusion. 2. Assessment of similarity between antigens using Ouchterlony's double diffusion test. 3. Estimation of antigen concentration using radial immunodiffusion. 4. Quantitative precipitation assay 5. DOT ELISA 6. Latex agglutination 7. Immunoelectrophoresis	<b>No. of hours</b>       30
	8. Rocket immunoelectrophoresis 9. Sampling of fish and shellfish for disease diagnosis. 10. Identification of bacteria- staining techniques and biochemical techniques. 11. Observation of cellular components of fish blood and shrimp hemolymph. 12. Isolation and characterization of fungi from fish & slide culture of fungi. 13. SDS-PAGE analysis of fish proteins. 14. Fish/shrimp cell culture. 15. Identification of fish pathogens using various techniques.	30
<b>Pedagogy:</b>	Lectures/ tutorials-assignments/hands-on practical	

<b>References/ Readings:</b>	<ol style="list-style-type: none"> <li>1. G.L. Bullock, Diseases of Fisheries. Narendra Publishing House, 2014.</li> <li>2. J. Edward J, Fish Disease: Diagnosis and treatment. Wiley Blackwell, 2010.</li> <li>3. I. R. Freshney, Culture of Animal Cells. Wiley-Blackwell, 1998.</li> <li>4. V. Inglis, Bacterial Diseases of Fish. Wiley Publications, 2013.</li> <li>5. C.A. Janeway, P. Travers, M. Walport, M. Shlomchik, Immunobiology: The Immune System in Health and Disease. Garland Publishing, USA, 2001.</li> <li>6. K.R. Joshi, N.O. Osama, Immunology. 5<sup>th</sup> Edition, Agrobios Ltd, India, 2012.</li> <li>7. G.P. Talwar, S.K Gupta. A Handbook of Practical and Clinical Immunology Vol I CBS Publishers, 2017.</li> <li>8. R. Thanwal, A Handbook of Diseases. Astha Publishers &amp; Distributors, 2014.</li> </ol>
<b>Course Outcomes:</b>	<ol style="list-style-type: none"> <li>1. Key hands-on experience in converting and applying theoretical knowledge to the laboratory.</li> <li>2. Students will become familiar with immunologic techniques that are used in clinical medicine as well as immunology research laboratories.</li> <li>3. Students will be able to understand and develop interest towards functionality of various immunodiagnostic kits and its application in health and disease related research.</li> <li>4. Students become familiar with techniques involved marine pathogen identification, characterization, cell culture, analysis of fish blood cells and proteins.</li> </ol>