



**University of Management & Technology**  
**School of Science**  
**Department of Life Sciences**

**MB303 Freshwater Microbiology (N1)**

<b>Lecture Schedule</b>	Wednesday & Thursday 15:30 – 16:45	<b>Semester</b>	Spring 2021
<b>Pre-requisite</b>	F.Sc. /A-level	<b>Credit Hours</b>	3
<b>Instructor(s)</b>	Mr. Ghadir Ali	<b>Contact Moodle link</b>	<a href="mailto:ghadir.ali@umt.edu.pk">ghadir.ali@umt.edu.pk</a>
<b>Office</b>	IHM Hall Cabin # 4	<b>Office Hours</b>	Displayed on office door & on Moodle
<b>Objectives</b>	<ul style="list-style-type: none"> <li>• To develop the understanding of fresh water reservoirs and their ecosystem</li> <li>• To understand the portability of fresh water and implication of fresh water microbes on geochemical environment.</li> </ul>		
<b>Expected Outcomes</b>	<ul style="list-style-type: none"> <li>• Develop an understanding of role of microorganisms in fresh water environment</li> <li>• Understand and evaluate methods and approaches used to study fresh water microorganisms</li> <li>• Explore the role of microbes in fresh water environment and biogeochemical cycles</li> <li>• Understand some common diseases of fresh-water fauna</li> </ul>		
<b>Lab Work</b>	<ol style="list-style-type: none"> <li>1. Study of microbial population from fresh water.</li> <li>2. Study of Microbial counts.</li> <li>3. Biological oxygen demand of fresh water sample.</li> <li>4. Effect of physical factors on microbial fresh water flora.</li> </ol>		
<b>Text book &amp; Reference book(s)</b>	<ol style="list-style-type: none"> <li>1. Gjedrem, T., 2005. Selection and Breeding Programs in Aquaculture. Springer-Verlag, New York, LLC.</li> <li>2. Laybourn, P. and Johanna., 2006. Freshwater Biology, Volume 51, Number 10. Blackwell Publishing.</li> <li>3. Robson, G. D, van West P. and Gadd, G. M., 2007. Exploitation of Fungi. Cambridge University Press.</li> <li>4. Berthelin, J., 2008. Effect of Mineral-Organic-Microorganism Interactions on Soil and Freshwater Environments: 1st Edition .Springer-Verlag New York, LLC</li> <li>5. David Sigeo, D., 2012. Freshwater Microbiology: Biodiversity and Dynamic Interactions of Microorganisms in the Aquatic Environment 1st Edition. Publisher: Wiley, John &amp; Sons</li> <li>6. Sigeo, D. (2005). Freshwater microbiology: biodiversity and dynamic interactions of microorganisms in the aquatic environment. John Wiley &amp; Sons.</li> </ol>		
<b>Grading Policy</b>	Assignments:	10%	
	Quizzes:	10%	
	Discussion Forum	05%	

	Midterm:	25%
	Final:	50%

## Course Schedule

Week	Lecture #	TOPICS
1	1 2	<ul style="list-style-type: none"> <li>• Introduction to fresh-water environment</li> <li>• And its microbiology</li> </ul>
2	1 2	<ul style="list-style-type: none"> <li>• Stratifications in lakes</li> <li>• And ponds.</li> </ul>
3	1 2	<ul style="list-style-type: none"> <li>• Laws of ecology with particular reference to fresh-water ecosystem</li> <li>• Environmental factors (biotic and abiotic) and their influence on the distribution of microorganisms.</li> </ul>
4	1 2	<ul style="list-style-type: none"> <li>• Enumeration of bacteria:</li> <li>• Sampling and samplers</li> </ul>
5	1 2	<ul style="list-style-type: none"> <li>• Processing and actual enumeration procedures</li> <li>• Fresh-water microorganisms</li> </ul>
6	1 2	<ul style="list-style-type: none"> <li>• Some important groups of fresh-water microorganisms</li> <li>• Detailed study of biogeochemical cycling</li> </ul>
7	1 2	<ul style="list-style-type: none"> <li>• Carbon cycle</li> <li>• Nitrogen cycle</li> </ul>
8	1 2	<ul style="list-style-type: none"> <li>• Sulfur cycle</li> <li>• Phosphorus cycle</li> </ul>
9		<ul style="list-style-type: none"> <li>• <b>Mid Term</b></li> </ul>
10	1 2	<ul style="list-style-type: none"> <li>• Advantages of fresh-water microorganisms</li> <li>• Disadvantages of fresh-water microorganisms</li> </ul>
11	1 2	<ul style="list-style-type: none"> <li>• Biological oxygen demand of fresh water sample</li> <li>• Difference between fresh water and drinking water</li> </ul>
12	1 2	<ul style="list-style-type: none"> <li>• Effect of physical factors on microbial fresh water flora</li> </ul>
13	1 2	<ul style="list-style-type: none"> <li>• Impacts of the pollution levels on fresh water</li> </ul>
14	1 2	<ul style="list-style-type: none"> <li>• Importance in fresh-water biotechnology</li> <li>• An introduction to aquaculture</li> </ul>
15	1 2	<ul style="list-style-type: none"> <li>• Some common microbiological problems in aquaculture</li> <li>• Some common diseases of fresh-water fauna.</li> </ul>
16		<ul style="list-style-type: none"> <li>• <b>Final term</b></li> </ul>