



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

**MB-212 Microbial Taxonomy (N1)**

<b>Lecture Schedule</b>	Tuesday & Wednesday 12:30 - 13:45 & 08:00 - 09:15	<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>• Identify the objectives of classification.</li> <li>• Identify traits used to classify microorganisms.</li> <li>• Locate microorganisms in the realm of living world.</li> </ul>		
<b>Expected Outcomes</b>	<ul style="list-style-type: none"> <li>• Develop an understanding of communities of microorganisms, including the roles of microbes within an ecosystem, the structure of microbial communities, and the impact of environment on the community (and vice versa).</li> <li>• Understand and evaluate methods and approaches used to study relationships and evolution (phylogeny) of microbes, particularly Bacteria and Archaea, and develop an understanding of the current classification of microbe groups.</li> <li>• Explore taxonomic strategies and approaches used to name microorganisms, and the criteria used to define bacterial species and sub-specific divisions within species</li> <li>• Understand the principles and methods behind studying and identifying cultured and uncultured microorganisms.</li> </ul>		
<b>Lab Work</b>	<ul style="list-style-type: none"> <li>• Characterization of bacteria (enteric &amp; nosocomial) and fungi on the basis of different biochemical and cultural characteristics.</li> <li>• Study of phylogenetic relationship using appropriate computer software.</li> </ul>		
<b>Text book &amp; Reference book(s)</b>	<ol style="list-style-type: none"> <li>1. Garrity, G. M., Krieg, N. R., Brenner, D. J., 2006. Bergey's Manual of Systematic Bacteriology: The Proteobacteria, Vol. 2. Williams and Wilkins Co, Baltimore.</li> <li>2. Scott F. and Jon c. H., 2007. Evolutionary Analysis. Benjamin Cummings.</li> <li>3. Roberto K. and Stanley M. 2012. Microbes and Evolution: The World That Darwin Never Saw. ASM. Press.</li> <li>4. David L. K. 2012. Process in Microbial Ecology. Oxford University Press.</li> <li>5. Ralf G. Dietzgen, R.F., and Ivan V. Kuzmin, I.V., 2012. Rhabdoviruses: Molecular Taxonomy, Evolution, Genomics, Ecology, Host-Vector Interactions, Cytopathology and Control Caister Academic Press. USA.</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>• Basic concepts and aims of classification.</li> <li>• Groups of biological organisms on the basis of shared characteristics</li> </ul>
2	1 2	<ul style="list-style-type: none"> <li>• Classical and molecular basis of classification of prokaryotes</li> </ul>
3	1 2	<ul style="list-style-type: none"> <li>• Classical and molecular basis of classification of eukaryotes.</li> </ul>
4	1 2	<ul style="list-style-type: none"> <li>• Bacterial nomenclature</li> <li>• Introduction to classification established by Carl Linnaeus, each species has to be assigned to a genus</li> </ul>
5	1 2	<ul style="list-style-type: none"> <li>• Microbial metabolic diversity: types of microbial metabolism and metabolic diversity: autotrophy, heterotrophy, chemolithotrophy, phototrophy, syntrophy etc. In detail: phototrophy</li> </ul>
6	1 2	<ul style="list-style-type: none"> <li>• Classification of Enterobacteriaceae</li> <li>• Important genera of Enterobacteriaceae</li> </ul>
7	1 2	<ul style="list-style-type: none"> <li>• Classification of Spore-forming bacteria include Bacillus (aerobic) and Clostridium (anaerobic) species.</li> </ul>
8	1 2	<ul style="list-style-type: none"> <li>• Actinomycetes introduction and classification</li> <li>• Mycobacterium &amp; Nocardia</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>• Spirochetes introduction and classification</li> <li>• Treponema &amp; Leptospira</li> </ul>
11	1 2	<ul style="list-style-type: none"> <li>• Detailed classification of viruses</li> </ul>
12	1 2	<ul style="list-style-type: none"> <li>• Classification of fungi and protozoa</li> </ul>
13	1 2	<ul style="list-style-type: none"> <li>• Classification of Algae</li> <li>• A brief introduction of Rickettsia</li> </ul>
14	1 2	<ul style="list-style-type: none"> <li>• Introduction to Chlamydia and Mycoplasma.</li> </ul>
15	1 2	<ul style="list-style-type: none"> <li>• An introduction to Prions and Viroids.</li> </ul>
16		<ul style="list-style-type: none"> <li>• Final term</li> </ul>