



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

BT-213 Microbiology / Fundamentals of Microbiology

Lecture Schedule	Monday & Wednesday 11:00-12:15	Semester	Spring 2021
Pre-requisite	F.Sc. /A-level	Credit Hours	4
Instructor(s)	Dr. Muhammad Zaid	Contact Moodle link	muhammad.zaid@umt.edu.pk
Office	3S-37	Office Hours	Displayed on office door & on Moodle
Objectives	<ul style="list-style-type: none"> • To enable the students to work with microorganisms. • To understand the basic techniques of sterilization, culturing and isolation. • Determining different characteristics of the microorganisms. 		
Expected Outcomes	<ul style="list-style-type: none"> • This course is an introduction to microbiology • This course provides strong grounding in fundamental aspects of the basic biology of bacteria as well as a strong grounding in molecular biology and microbial genetics. • This course will introduces the basic principles of microbiology examining the microbes that inhabit our planet and their effect on the biosphere. • Lecture topics explore the basic principles of microbiology and examine the microbes that inhabit our planet and their effect on the biosphere. • Students will analyze the influence of microbiology and 21st century challenges and opportunities that arise from our changing relationship with and understanding of microbes. 		
Lab Work	<ul style="list-style-type: none"> • Laboratory safety: Containment and decontamination. • An introduction to microscopy. • Principles of Staining Procedures: Simple staining, Gram’s staining, Acid-fast staining, cell-wall staining, flagellar staining, capsule staining, spore staining and spirochaete staining. Study of cell motility by hanging drop preparation. • Preparation and sterilization of bacteriological media and glassware. • Inoculation techniques. Study of colony characteristics of microorganisms. • Standard plate count technique (SPC). • Microbiological analysis of air. 		
Text book & Reference	<ol style="list-style-type: none"> 1. Baker, S., Khan, N., Nicklin, J. and Killington, R., 2016. Instant Notes in Microbiology, 5th edition, Taylor and Francis. 		

book(s)	<ol style="list-style-type: none"> 2. Black, J. G. 2014. Microbiology: Principles & Explorations, 7th edition, John Wiley and Sons, N.Y. 3. Talaro, K. P. 2012. Foundations in Microbiology: Basic Principles 7th edition, McGraw-Hill Companies, N.Y. 4. Tortora, G. J., Funke, B. R. and Case, C. L. 2012. Microbiology: An Introduction, 4th edition Benjamin-Cummings Publishing Company, U.S.A. 5. Tortora, G. J., Funke, B. R. and Case, C. L. 2012. Study Guide for Microbiology: An Introduction. 11th edition. Benjamin-Cummings Publishing Company, U.S.A. 						
Grading Policy	<table> <tr> <td>Assignments + Quizzes:</td> <td>20%</td> </tr> <tr> <td>Midterm:</td> <td>30%</td> </tr> <tr> <td>Final:</td> <td>50%</td> </tr> </table>	Assignments + Quizzes:	20%	Midterm:	30%	Final:	50%
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Final:	50%						

Course Schedule

Week	Lecture #	TOPICS	CH
1	1 2	<ul style="list-style-type: none"> • Introduction to Microbiology: Scope, definition, branches. 	
2	1 2	<ul style="list-style-type: none"> • Applied areas of Microbiology. 	
3	1 2	<ul style="list-style-type: none"> • Historical development of Microbiology 	
4	1 2	<ul style="list-style-type: none"> • Diversity of microbes. Differentiation between Prokaryotes and eukaryotes. 	
5	1 2	<ul style="list-style-type: none"> • An outline of the principles and applications bright field, dark field, phase contrast, fluorescent and electron microscope. 	
6	1 2	<ul style="list-style-type: none"> • Morphology, arrangement and detailed anatomy of bacterial cell. Ultra-structure of bacteria. 	
7	1 2	<ul style="list-style-type: none"> • Microbial growth and requirements: Physicochemical requirements; pH, temperature, oxidation reduction potential, gaseous and nutritional requirements. 	
8	1 2	<ul style="list-style-type: none"> • Microbial multiplication and growth curves. 	
9	1 2	<ul style="list-style-type: none"> • Mid Term • General methods of studying microorganisms: cultivation, isolation, purification and characterization. 	
10	1 2	<ul style="list-style-type: none"> • Microbial culture systems, Microbial preservation. 	
11	1 2	<ul style="list-style-type: none"> • Control of microorganisms by physical and chemical methods. 	
12	1 2	<ul style="list-style-type: none"> • Chemotherapeutic agents and antibiotics. Modes of action of antibiotics on microorganisms. 	
13	1 2	<ul style="list-style-type: none"> • Antibiotic resistance. • Microbiology of soil, freshwater and seawater 	
14	1 2	<ul style="list-style-type: none"> • Symbiosis, carbon, nitrogen, sulfur and phosphorus cycles 	
15		<ul style="list-style-type: none"> • Final term 	