

MBY1CJ 101/ MBY1MN100. INTRODUCTION TO MICROBIOLOGY

Programme	B. Sc. Microbiology				
Course Code	MBY1CJ 101/ MBY1MN100				
Course Title	Introduction to Microbiology				
Type of Course	Major/Minor				
Semester	I				
Academic Level	100 - 199				
Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours
	4	3	-	2	75
Pre-requisites	Nil				
Course Summary	This introductory course covers the fundamental aspects of microbiology, exploring microbial diversity, structure, function, and its impacts on human and environmental health. It provides students with theoretical knowledge and practical skills fundamental for further studies in microbiology and related fields.				

Course Outcomes (CO):

CO	CO Statement	Cognitive Level*	Knowledge Category#	Evaluation Tools used
CO1	Understand the diversity, morphology, and reproduction of bacteria, fungi, and viruses.	U	C	Internal Exam, Assignment, End Semester Examination
CO2	Explain the historical development and scope of microbiology, including the contributions of key scientists.	U	C	Internal Exam, Assignment, End Semester Examination
CO3	Differentiate the fundamental structures of prokaryotic and eukaryotic cells, and describe the major differences.	An	C	Internal Exam, Assignment, End Semester Examination
CO4	Describe the roles of beneficial and harmful microorganisms in various environments.	U	C	Internal Exam, Assignment, End Semester Examination
CO5	Demonstrate basic microbiological laboratory techniques, including microscopy, staining, and culture methods.	Ap	P	Practical Assessment

* - Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C)

- Factual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)

Detailed Syllabus:

Module	Unit	Content	Hrs (45 +30)	Marks (70)
I	The Microbial World		10	15
	1	Bacterial forms and arrangement of cells.		
	2	Morphology of molds and yeasts		
	3	Sexual and asexual reproduction in fungi.		
	4	Viral morphology and replication processes.		
	5	Structure, lytic cycle, and lysogeny of bacteriophages.		
II	History of Microbiology		10	15
	6	Overview of microbiology's scope and its historical development.		
	7	Debate of Spontaneous generation vs. Biogenesis.		
	8	Contributions of Anton van Leeuwenhoek, Joseph Lister, Paul Ehrlich, and other pioneers.		
	9			
III	Fundamental Structure of Cell		15	25
	10	General structure of prokaryotic and eukaryotic cells and their differences.		
	11	Structures of archaeobacteria and eubacteria.		
	12	Detailed analysis of bacterial ultrastructure (e.g., glycocalyx, capsule).		
	13	Composition and structure of gram-positive and gram-negative cell walls.		
	14	Cell membrane structure, function, and composition in bacteria and archaea.		
	15	Cytoplasmic structures (e.g., ribosomes, inclusion bodies).		
	16	Endospore formation and sporulation stages.		
IV	Beneficial & Harmful Microorganisms		10	15
	17	Roles of beneficial soil microbes like PGPR and mycorrhizae.		
	18	Biopesticides and biocontrol agents.		
	19	Beneficial microbes in food industries.		
	20	Application of microbes in pharmaceutical industries.		
	21	Overview of pathogenic bacteria, fungi, protozoa, and viruses.		
	22	Impact of microorganisms on human, animal, and plant health.		
V	Practical Applications in Microbiology		30	
	1	Introduction to laboratory instruments and safety precautions.		
	2	Common methods of sterilization.		
	3	Microscope maintenance and usage.		