

Semester	7
Course	Minor
Paper Code	B4MB230711T
Paper Title	Applied Microbiology
No. of Credits	4
Theory / Practical / Composite	THEORY
Minimum No. of preparatory hours per week a student has to devote	4 hours/week
Number of Modules	No modules
Syllabus	UNIT 1 Medical Microbiology • Host-Pathogen Interactions; Normal microflora and opportunistic pathogens; Nosocomial and iatrogenic infections. • Bacterial diseases including causal agents, symptoms, mode of transmission, prophylaxis and control: <i>Staphylococcus aureus</i>, <i>Escherichia coli</i>, <i>Salmonella typhi</i>, <i>Haemophilus influenzae</i>, <i>Bacillus anthracis</i>, <i>Mycobacterium tuberculosis</i>. • Viral diseases including causal agents, symptoms, mode of transmission, prophylaxis and control: Hepatitis, Dengue, AIDS, Herpes, COVID. • Antibiotic resistance. UNIT 2 Environmental and Applied Microbiology • Enrichment culture techniques, Detection of specific microorganisms on- XLD agar, Salmonella-Shigella agar, Mannitol Salt agar, EMB agar, McConkey agar, Saboraud Dextrose agar. • Concept of pathogenic microorganisms in Air, Water and Soil. • Role of microorganisms in Food Microbiology. • Probiotic Foods- Definition, types, microorganisms and health benefits. • Microorganisms used as biopesticides, biofertilizers, biodeterioration and bioremediation (e.g. hydrocarbons in oil spills).
Learning Outcomes	• Explain host–pathogen interactions and the role of normal microbiota in human health. • Identify major bacterial and viral pathogens and describe their transmission, symptoms, prevention,

	and control. • Explain the causes and consequences of antibiotic resistance. • Use selective and differential media for the detection of specific microorganisms. • Assess the significance of microorganisms in air, water, soil, and food. • Evaluate the applications of microorganisms in probiotics, biofertilizers, biopesticides, and bioremediation.	
Reading/Reference Lists	1. Tortora GJ, Funke BR and Case CL. (2008). Microbiology: An Introduction. 9th edition. Pearson Education 2. Madigan MT, Martinko JM, Dunlap PV and Clark DP. (2014). Brock Biology of Microorganisms. 14th edition. Pearson International Edition 3. Cappuccino J and Sherman N. (2010). Microbiology: A Laboratory Manual. 9th edition. Pearson Education Limited 4. Wiley JM, Sherwood LM and Woolverton CJ. (2013) Prescott's Microbiology. 9th Edition. McGraw Hill International. 5. Atlas RM. (1997). Principles of Microbiology. 2nd edition. WM.T.Brown Publishers. 6. Pelczar MJ, Chan ECS and Krieg NR. (1993). Microbiology. 5th edition. McGraw Hill Book Company. 7. Stanier RY, Ingraham JL, Wheelis ML, and Painter PR. (2005). General Microbiology. 5th edition. McMillan 8. Advanced Microbiology online MOOC course by Dr Arup Kumar Mitra- https://onlinecourses.swayam2.ac.in/cec22_bt20/preview	
Evaluation	Theory CIA: 30 Semester Exam:70	Practical (if applicable) CA: Semester Exam:
Paper Structure for Theory Semester Exam	Full marks 70 Short questions: 10 (each 2 marks) from 12 (10x2=20) Long questions: 5 (each 10 marks) from 7 (5x10=50)	