UNIVERSITY OF MADRAS

B.Sc. DEGREE PROGRAMME IN MICROBIOLOGY

SYLLABUS WITH EFFECT FROM 2023-2024

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
136C11	Practical I - Fundamentals of Microbiology and Microbial Diversity	Core-II: Practical I	-	-	Y	-	5	5	40	60	100

Course Objectives	
CO1	Acquire knowledge on Cleaning of glass wares, GLP and sterilization.
CO2	Gain knowledge on media preparation and cultural characteristics.
CO3	Learn the pure culture technique
CO4	Learn the microscopic techniques and staining methods.
CO5	Acquire knowledge on stain and staining methods

UNIT	Details	No.of Hours	Course Objectives
I	Cleaning of glass wares, Microbiological good laboratory practice and safety. Sterilization and assessment of sterility– Autoclave, hot air oven, and membrane filtration.	12	CO1
II	Media preparation: Liquid media, solid media, semi-solid media, agar slants, agar deeps, agar plates.	12	CO2
III	Preparation of basal, differential, enriched, enrichment, transport, and selective media preparation - Quality control of media, growth supporting properties, sterility check of media. Pure culture techniques: Streak plate, pour plate, decimal dilution.	12	CO3
IV	Culture characteristics of microorganisms: Growth on different media, growth characteristics, and description. Demonstration of pigment production. Microscopy: Light microscopy and bright field microscopy.	12	CO4
V	Staining techniques: Smear preparation, simple staining, Gram's staining and endospore staining. Study on Microbial Diversity using Hay Infusion Broth-Wet mount to show different types of microbes and hanging drop.	12	CO5
	Total	60	

UNIVERSITY OF MADRAS

B.Sc. DEGREE PROGRAMME IN MICROBIOLOGY

SYLLABUS WITH EFFECT FROM 2023-2024

Course Outcomes		
Course Outcomes	On completion of this course, students will;	
CO1	Practice sterilization methods; learn to prepare media and their quality control.	PO4, PO7, PO8, PO9, PO11
CO2	Learn streak plate, pour plate and serial dilution and pigment production of microbes.	PO4, PO7, PO8, PO9
CO3	Understand Microscopy methods, different Staining techniques and motility test.	PO4, PO7, PO8, PO9, PO11
CO4	Observe culture characteristics of microorganisms.	PO4, PO7, PO8, PO9
CO5	Study on Microbial Diversity using Hay Infusion Broth-Wet mount	PO4, PO7, PO8, PO9
Text Books		
1	James G Cappucino and N. Sherman MB(1996). A lab manual Benjamin Cummins, New York 1996.	
2	Kannan. N (1996). Laboratory manual in General Microbiology. Palani Publications.	
3	Sundararaj T (2005). Microbiology Lab Manual (1st edition) publications.	
4	Gunasekaran, P. (1996). Laboratory manual in Microbiology. New Age International Ld., Publishers, New Delhi.	
5	R C Dubey and D K Maheswari (2002). Practical Microbiology. S. Chand Publishing.	
References Books		
1	Atlas.R (1997). Principles of Microbiology, 2nd Edition, Wm.C.Brown publishers.	
2	Amita J, Jyotsna A and Vimala V (2018). Microbiology Practical Manual. (1st Edition). Elsevier India	
3	Talib VH (2019). Handbook Medical Laboratory Technology. (2nd Edition). CBS	
4	Wheelis M, (2010). Principles of Modern Microbiology, 1st Edition. Jones and Bartlett Publication.	
5	Lim D. (1998). Microbiology, 2nd Edition, WCB McGraw Hill Publications.	
Web Resources		
1	http://www.biologydiscussion.com/micro-biology/sterilisation-and-disinfection-methods-and-principles-microbiology/24403.	
2	https://www.ebooks.cambridge.org/ebook.jsf?bid=CBO9781139170635	
3	https://www.grsmu.by/files/file/university/cafedry//files/essential_microbiology.pdf	
4	https://microbiologyinfo.com/top-and-best-microbiology-books/	

5	https://www.cliffsnotes.com/studyguides/biology/microbiology/introduction-to-microbiology/a-brief-history-of-microbiology

Methods of Evaluation		
Internal Evaluation	Continuous Internal Assessment Test	25 Marks
	Assignments	
	Seminars	
	Attendance and Class Participation	
External Evaluation	End Semester Examination	75 Marks
	Total	100 Marks

Methods of Assessment	
Recall (K1)	Simple definitions, MCQ, Recall steps, Concept definitions
Understand/ Comprehend (K2)	MCQ, True/False, Short essays, Concept explanations, Short summary or overview
Application (K3)	Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain
Analyze (K4)	Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge
Evaluate (K5)	Longer essay/ Evaluation essay, Critique or justify with pros and cons
Create (K6)	Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations

Mapping with Programme Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1				M			L	M	L		M
CO2				S			L	L	L		
CO3				S			M	M	L		M
CO4				S			M	L	L		
CO5				S			M	L	L		