

**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
336C51	Practical V-Medical Microbiology	Core Course XI	Y	-	-	-	4	5	40	60	100

Course Objectives											
Unit	Details								No.of Hours	Course Objectives	
I	1. Collection and Transport of Clinical specimens. 2. Simple, Differential and Special staining of Clinical materials. 3. Culture techniques used to isolate microorganisms.								12	CO1	
II	4. Identification of bacterial pathogens by their biochemical reactions. 5. Antimicrobial susceptibility testing by disc-diffusion technique and determination of Minimum Inhibitory Concentration.								12	CO2	
III	6. Isolation of Bacteriophages from Sewage and other natural sources. 7. Identification of Viruses in Slides/Smears/Spotters. Demonstration of Negri bodies (Staining). 8. Cultivation of Viruses in Embryonated eggs – Amniotic, Allantoic, Yolk sac routes and Chorio-allantoic membrane.								12	CO3	
IV	9. Microscopic identification of medically important Fungi – KOH and Lactophenol cotton Blue staining. 10. Slide culture techniques for fungal Identification 11. Identification of Dermatophytes. 12. Germ tube test, Carbohydrate fermentation and assimilation tests for Yeasts.								12	CO4	
V	13. Direct Examination of Faeces – wet mount and Iodine mount – Demonstration of Protozoan cysts and Helminthes eggs. 14. Concentration techniques of stool specimen – Floatation and Sedimentation methods. 15. Examination of blood for Malarial parasites – thin and thick								12	CO5	

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	smear preparations. 16. Identification of Medically important parasites in slides / specimens as spotters.		
	Total	60	

**Course Outcomes**

<b>Course Outcomes</b>	On completion of this course, students will;	
CO1	Demonstrate methods to observe and measure microorganisms by standard microbiological techniques	PO4, PO5, PO7.
CO2	Identify pathogenic microorganisms in the laboratory set-up and interpret their sensitivity towards commonly administered antibiotics.	PO4, PO5, PO7, PO8.
CO3	Understand experimental tools used to cultivate and characterize clinically important viruses and bacteriophages	PO4, PO5, PO7, PO8.
CO4	Elucidate clinically important fungi.	PO4, PO5, PO7, PO8.
CO5	Investigate Parasites of medical importance and identify them from clinical specimens.	PO4, PO5, PO7, PO8.

**Text Books**

1.	Dubey, R.C. and Maheswari, D.K. (2020). S. Chand Publishers. ISBN-13: 978-8121921534, ISBN-10: 8121921538.
2.	K.R. Aneja (2017). Experiments in Microbiology, Plant Pathology, Tissue Culture and Microbial Biotechnology. 5 <sup>th</sup> Edition. New Age International Publishers. ISBN-10: 9386418304, ISBN-13: 978-9386418302.
3	Collee, J.G., Fraser, A.G., Marnion, B.P. and Simmons, A. (1996). Mackie & McCartney Practical Medical Microbiology. 14 <sup>th</sup> Edition. Elsevier. ISBN-10: 813120393X, ISBN-13: 978-8131203934.
4	Prince CP (2009). Practical Manual of Medical Microbiology, 1st edition, Jaypee digital publishing.
5	James H. Jorgensen, Karen C. Carroll, Guido Funke, Michael A. Pfaller, Marie Louise Landry, Sandra S. Richter, David W. Warnock (2015). Manual of Clinical Microbiology, 11th Edition, ASM press

**References Books**

1	Patricia M. Tille (2021). Bailey & Scott's Diagnostic Microbiology, 15 <sup>th</sup> Edition. Elsevier. ISBN-10: 0323681050, ISBN-13: 978-0323681056.
2	Monica Cheesbrough (2006). District Laboratory Practice in Tropical Countries. Part 1. 2 <sup>nd</sup> Edition. Cambridge University Press. ISBN-10: 0521171571, ISBN-13: 978-0521171571.
3	Michael A. Pfaller (ed.) (2015). Manual of Clinical Microbiology. Vol. 1 and 2. 11 <sup>th</sup> Edition. ASM Press. ISBN-10: 9781555817374, ISBN-13: 978-1555817374.
4	Josephine A. Morello, Paul A. Granato and Helen EckelMizer (2002). Laboratory Manual and Workbook in Microbiology. 7 <sup>th</sup> Edition. The McGraw Hill Company. ISBN: 0-07-246354-6.
5	Rowland, S.S., Walsh, S.R., Teel, L.D. and Carnahan, A.M. ((1994). Pathogenic and Clinical Microbiology: A Laboratory Manual. Lippincott Williams & Wilkins. ISBN-10:

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	0316760498, ISBN-13: 9780316760492.	
<b>Web Resources</b>		
1	<a href="https://www.microcarelab.in/media/microcarelab.in/files/Sample-Collection-Manual.pdf">https://www.microcarelab.in/media/microcarelab.in/files/Sample-Collection-Manual.pdf</a>	
2	<a href="http://ssu.ac.ir/cms/fileadmin/user_upload/Daneshkadaha/pezeshki/microb/file_amuzeshi/Lab_QA_Microbiology_QA.pdf">http://ssu.ac.ir/cms/fileadmin/user_upload/Daneshkadaha/pezeshki/microb/file_amuzeshi/Lab_QA_Microbiology_QA.pdf</a>	
3	<a href="https://www.academia.edu/11977315/Basic_Laboratory_Procedures_in_Clinical_Bacteriology">https://www.academia.edu/11977315/Basic_Laboratory_Procedures_in_Clinical_Bacteriology</a>	
4	<a href="https://cmr.asm.org/content/31/3/e00062-17.full.pdf">https://cmr.asm.org/content/31/3/e00062-17.full.pdf</a>	
5	<a href="https://microbiologyinfo.com/techniques-of-virus-cultivation/">https://microbiologyinfo.com/techniques-of-virus-cultivation/</a>	
<b>Methods of Evaluation</b>		
<b>Internal Evaluation</b>	Continuous Internal Assessment Test	25 Marks
	Assignments	
	Seminars	
	Attendance and Class Participation	
<b>External Evaluation</b>	End Semester Examination	75 Marks
	Total	100 Marks
<b>Methods of Assessment</b>		
<b>Recall (K1)</b>	Simple definitions, MCQ, Recall steps, Concept definitions	
<b>Understand/ Comprehend (K2)</b>	MCQ, True/False, Short essays, Concept explanations, Short summary or overview	
<b>Application (K3)</b>	Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain	
<b>Analyze (K4)</b>	Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge	
<b>Evaluate (K5)</b>	Longer essay/ Evaluation essay, Critique or justify with pros and cons	
<b>Create (K6)</b>	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				S	M		S				
CO2				S	S		S	L			
CO3				S	S		S	L			
CO4				S	S		S	L			
CO5				S	S		S	L			