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	Exter-nal	Total
236C41	**Immunology and Immunotechnology**	Core Course –VIII-Practical IV	**-**	**-**	**Y**	**-**	**5**	**5**	**40**	**60**	**100**

Course Objectives	
CO1	To gain hands-on knowledge to identify Blood group and typing.
CO2	To acquire adequate skill to perform latex agglutination reactions.
CO3	To analyze precipitation reactions in gels.
CO4	To investigate the antigen & antibody reactions in electrophoresis.
CO5	To familiarize with Separation of Lymphocytes.

Unit	Details	No.of Hours	Course Objectives
I	Identification of blood group and typing. Coomb's test. TPHA	12	CO1
II	T cell identification (Demonstration) Latex Agglutination reactions- RF, ASO, CRP	12	CO2
III	Ouchterlony's Double Diffusion Method (antigen pattern). Single Radial Immuno Diffusion Method.	12	CO3
IV	Electrophoresis - Serum, Counter and Immunoelectrophoresis.	12	CO4
V	Separation of Lymphocytes by density gradient centrifugation method. ELISA: Hepatitis/ HIV	12	CO5
	Total	60	

Course Outcomes

Course Outcomes	On completion of this course, students will;	
CO1	Assess the blood groups and types	PO1,PO5, PO6, PO7, PO8
CO2	Competently perform serological diagnostic tests such as RF, ASO, CRP	PO4, PO5, PO6, PO7, PO8

CO3	Illustrate the antigen antibody reactions in gel.	PO5, PO6, PO7, PO8, PO9
CO4	Compare & contrast antigens and antibodies in electrophoresis	PO5, PO6, PO7, PO8, PO9
CO5	Examine the concept of ELISA.	PO5, PO6, PO7, PO8, PO9
Text Books		
1.	**Talwar. (2006). Hand Book of Practical and Clinical Immunology, Vol. I, 2nd edition, CBS.**	
2.	Asim Kumar Roy. (2019). Immunology Theory and Practical**,** Kalyani Publications.	
3.	Richard Coico, Geoffrey Sunshine, Eli Benjamini. (2003). Immunology – A Short Course. 5thEdition., Wiley-Blackwell, New York.	
4.	Judith A.Owen, Jenni Punt, Sharon A. Stranford, Janis Kuby. (2013). Immunology, 7thEdition., W. H. Freeman and Company, New York.	
5.	Pravash Sen. Gupta. (2003). Clinical Immunology. Oxford University Press.	
References Books		
1	Frank C. Hay, Olwyn M. R. Westwood. (2008).Practical Immunology, 4th Edition, Wiley-Blackwell.	
2	Wilmore Webley. (2016). Immunology Lab Manual, LAD Custom Publishing.	
3	Rose. (1992). Manual of Clinical Lab Immunology, ASM.	
4	Janeway Travers. (1997). Immunobiology- the immune system in health and disease. Current Biology Ltd. London, New York. 3rd Edition.	
5	Peter J. Delves, Seamus Martin, Dennis R. Burton, Ivan M. Roitt. (2006). Roitt's Essential Immunology, 11thEdition., Wiley-Blackwell.	
Web Resources		
1	https://www.researchgate.net/publication/275045725_Practical_Immunology-_A_Laboratory_Manual	
2	https://www.urmc.rochester.edu/MediaLibraries/URMCMedia/labs/frelinger-lab/documents/Immunology-Lab-Manual.pdf	
3	https://webstor.srmist.edu.in/web_assets/downloads/2021/18BTC106J-lab-manual.pdf	
4	Immunology Overview - Medical Microbiology - NCBI Bookshelf (nih.gov)	
5	Immunology - an overview | ScienceDirect Topics	

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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
CO1	M				S	S	S	S	
CO2				S	M	M	S	S	
CO3					M	S	S	S	M
CO4					M	M	S	S	M
CO5					M	M	S	S	M