Syllabus template

Semester: 1	
Course : MOLECULAR MEDICAL MICROBIOLOGY (PGD MMM)	
Paper Title: Basic Laboratory techniques	
Paper code: DMMB5151	**Credits:** 4
Hours/week : 3	
Category: Core/MDC/SEC/VAC : Core	
Theory / Practical / Composite : Practical	
No of Modules : 1	

Course Overview: This practical course covers the fundamentals of basic laboratory techniques including good clinical laboratory techniques, conventional methods for the diagnosis ofinfectious diseases. It also covers common serological methods including ELISA, RIA etc.

Course Outcome: By the end of this course, students will be able to:

1) Remember, Understand and apply principles of "Good Clinical Laboratory Practice" and its utility, serological techniques etc
2) Learn about various types of media used to culture Microorganisms and culture techniques.
3) Explain the basic Principles of serology testing/analysis.
4) Describe the underlying mechanisms behind each serological test
5) Understand when and how to use the serological methods in diagnosis of certain bacterial, parasitic, Viral, diseases.

CO1: Remember:

1. The principles of good clinical practices, dos and don'ts within laboratory premises, Biomedical waste segregation, Bio-safety and bio-security
2. Fire safety; Chemical safety; Electrical safety and Immunization of laboratory workers
3. Remembering and learning anti-microbial Susceptibility Testing both disc diffusion tests and molecular methods
4. Common serological techniques routinely done in laboratories like Neutralization, Agglutination, Precipitation, ELISA, RIA, Immuno-fluorescence test etc.

CO2: Understand:

1. The principles behind the good clinical practices.
2. The principles behind the serological tests, microbiology studies

CO3: Apply:

1. Apply knowledge of good clinical practices in everyday work
2. Application of the knowledge of serological tests in interpreting the data.

CO4: Analyze:

1. Analysis of the observations and application of when and how to use the serological methods in diagnosis of bacterial, parasitic, viral diseases.
2. Integrate the concepts of good clinical practices in microbiology and immunology in infection control,

CO5: Evaluate:

1. Evaluate good clinical practices, microbial pathogenicity, host immune responses and control in laboratory and healthcare settings.

Prerequisites: ***Basic knowledge about any prior course***

SYLLABUS

UNIT/Module	CONTENT	HOURS or NUMBER OF CLASSES	CO Mapping	COGNITIVE LEVEL
I.	**Good Clinical Laboratory Practice** 1.Dos and don'ts within laboratory premises 1. Biomedical waste segregation 2. Bio-safety and bio-security 3. Use of PPE 4. Environmental cleaning and disinfection 5. Hand Hygiene 6. Management of sharps injury and splash exposure with laboratory or clinical areas 7. Spill management 8. Fire safety; Chemical safety; Electrical safety 9. Immunization of laboratory workers	**20**	**CO1,CO2,CO3, CO4, CO5**	**K1,K2,K3,K4,K5**
2.	**Conventional methods for the diagnosis ofinfectious diseases** 1. Microscopy 2. Culture: bacteria, mycobacteria, fungi, virus 3. Biochemical identification ofbacteria, fungi	**10**	**CO1,CO2,CO3,CO4,CO5,**	**K1,K2,K3,K4,K5**
3.	**Serological methods.** Neutralization Agglutination Precipitation Complement Fixation Test	**30**	**CO1,CO2,CO3,CO4,CO5**	**K1,K2,K3,K4,K5**

	ELISA and its modifications Radio-Immuno Assay Immuno-fluorescence test Immuno-chromatography test Anti-microbial Susceptibility Testing: Disc diffusion test E- test Broth Micro-Dilution test Automated Systems Molecular methods for anti-microbial susceptibility testing			

Text Books

Basic Serological Testing by Rowa Yousef Alhabbab

Medical Laboratory Technology, 4/e, Vol 2 Procedure Manual for Routine Diagnostic Tests Including Molecular Pathology by Kanai L Mukherjee

Growing Mycobacterium smegmatis mc 2 155, Phage hunting Program (Phage hunting PROTOCOLS).

Mackie & Mccartney Practical Medical Microbiology, 14th edition. 1996.
CLSI M100 – 2025. Performance Standards for Antimicrobial Susceptibility Testing, 35th Edition

Web Resources Suggested readings

1. WHO. Laboratory biosafety manual, 3rd edition, 2004. https://www.who.int/publications/i/item/9241546506 WHO.

2. The European Committee on Antimicrobial Susceptibility Testing - EUCAST. https://www.eucast.org/

Evaluation Total Marks: CIA: 80 MARKS
End Semester Viva Voce: 20 Marks

Course outcomes (COs) and Cognitive Level Mapping

COs	CO Description	Cognitive levels
CO1	**Remember:** 1. The principles of good clinical practices, dos and don'ts within laboratory premises, Biomedical waste segregation, Bio-safety and bio-security 2. Fire safety; Chemical safety; Electrical safety and Immunization of laboratory workers 3. Remembering and learning anti-microbial Susceptibility Testing both disc diffusion	K1

	tests and molecular methods 4. Common serological techniques routinely done in laboratories like Neutralization, Agglutination, Precipitation, ELISA, RIA, Immuno-fluorescence test etc.	
CO2	**Understand:** 1. The principles behind the good clinical practices. 2. The principles behind the serological tests, microbiology studies	K2
CO3	**Apply:** 1. Apply knowledge of good clinical practices in everyday work 2. Application of the knowledge of serological tests in interpreting the data.	K3
CO4	**Analyze:** 1.Analysis of the observations and application of when and how to use the serological methods in diagnosis of bacterial, parasitic, viral diseases. 2. Integrate the concepts of good clinical practices in microbiology and immunology in infection control,	K4
CO5	**Evaluate:** 1. Evaluate good clinical practices, microbial pathogenicity, host immune responses and control in laboratory and healthcare settings.	K5