



# TEERTHANKER MAHAVEER UNIVERSITY

(Established under Govt. of U. P. Act No. 30, 2008)  
Delhi Road, Moradabad (U.P.)

## PhD PROGRAMME

### SYLLABUS FOR DISCIPLINE-SPECIFIC COURSE MEDICAL MICROBIOLOGY

<b>Course Code:</b> PDS240146	<b>BASICS AND CLINICAL MICROBIOLOGY</b>	L	T	P	C
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<b>Objective:</b>	The objective of the course is to impart requisite clinical, diagnostics, teaching, and research skills with appropriate attitude and knowledge of Microbiology				
<b>Course Outcomes:</b>					
<b>CO 1:</b>	Understanding of Basic microbiology, diagnostic modalities & Immunology.				
<b>CO 2:</b>	Understanding of different bacterial pathogens infectivity, pathogenesis, and diagnosis.				
<b>CO 3:</b>	Understanding of different viral and fungal infectivity, pathogenesis, and their diagnosis in the laboratory.				
<b>CO 4:</b>	Understanding of different MDR pathogens & their control.				
<b>CO 5:</b>	Understanding of different Hospital-associated infections.				
<b>Course Content:</b>					
<b>Unit 1:</b>	<p>General Microbiology &amp; Immunology:            Historical events, Introduction, Morphology and physiology of bacteria, Microbial pathogenicity.            Sterilization and disinfection, Culture media and culture method, Identification of bacteria.            Bacterial genetics.            Antimicrobial agent, antimicrobial resistance, and antimicrobial susceptibility testing.            Recent advanced diagnostics (MALDI-TOF, CB-NAAT, PCR, Blotting techniques, Immunoassay).            Immunity, Antigen, Antibody, Antigen-antibody reaction.            Complement system pathway.            Structure of immune system, Immune response (CMI &amp; AMI), Hypersensitivity.            Autoimmunity, Immunodeficiency disorders.            Transplant and cancer immunology, Immunoprophylaxis and immunohematology.</p>				
<b>Unit 2:</b>	<p>Systematic Bacteriology:            Gram positive cocci: Staphylococcus, Streptococcus, Enterococcus and Pneumococcus.            Gram negative cocci: Neisseria and Moraxella.            Gr bacilli: Corynebacterium, Bacillus, Anaerobes (Clostridium and non-sporing anaerobes), Mycobacteria (M. tuberculosis, non-tuberculous mycobacteria, and M. leprae).</p>				

	<p>Gram negative bacilli: Enterobacteriaceae-I (Escherichia, Shigella, Klebsiella, proteus, Yersinia and others), Enterobacteriaceae-II, Salmonella.</p> <p>Vibrio and aeromonas, Pseudomonas and other non-fermenters, Haemophilus, HACEK group, Bordetella and Brucella.</p> <p>Other groups of bacteria: Spirochetes (Treponema, Borrelia, Leptospira), Rickettsiae, Coxiella, Bartonella, Chlamydiae, Mycoplasma and Ureaplasma.</p>
<b>Unit 3:</b>	<p>Virology &amp; Medical Mycology:</p> <p>General properties of Viruses.</p> <p>DNA viruses: Herpesviruses (Herpes simplex viruses, Varicella zoster virus, CMV, EBV, Parvoviridae, Papillomaviridae, Poliomyoviridae, Poxviridae, Adenoviridae and Bacteriophages).</p> <p>RNA viruses: Myxoviruses and Rubella, Picornaviruses, Arboviruses, Rhabdoviruses, HIV and other Retroviruses, Hepatitis, Oncogenic viruses.</p> <p>Fungi causing superficial, systemic and opportunistic fungal infections and their diagnosis.</p>
<b>Unit 4:</b>	<p>Hospital infection control:</p> <p>HAI and its types-surveillance and prevention, BMW, NSI and its prevention and management.</p> <p>Antimicrobial stewardship.</p> <p>Environmental surveillance.</p>
<b>Unit 5:</b>	<p>Clinical Microbiology:</p> <p>Bloodstream infections, Healthcare-associated infections, Gastrointestinal infections, Respiratory tract infections, Central nervous system infections, Urogenital infections, Congenital infections, emerging and re-emerging infections &amp; their diagnostic approach.</p>
<b>Text Books:</b>	<ol style="list-style-type: none"> <li>1. Gillespie's Medical Microbiology and Infection at a Glance, 4th Edition</li> <li>2. Mackie and McCartney's Practical Medical Microbiology, 14th Edition</li> <li>3. Jawetz Melnick and Adelbergs' Medical Microbiology, 26th Edition</li> <li>4. Kuby's Immunology, 7th Edition Abbas' Cellular and Molecular Immunology, 8th Edition</li> <li>5. Patrick R Murray's Medical Microbiology, 7th Edition</li> </ol>
<b>Reference Books:</b>	<ol style="list-style-type: none"> <li>1. Harrison's Principles of Internal Medicine, 18th Edition.</li> <li>2. Bailey &amp; Scott's Diagnostic Microbiology, 13th Edition</li> <li>3. Koneman's Color Atlas and Textbook of Diagnostic Microbiology, 6th Edition</li> <li>4. Topley and Wilson's Microbiology and Microbial Infections, 10th Edition</li> <li>5. Robbins &amp; Cotran Pathologic Basis of Disease, 9th Edition.</li> </ol>