



Master of Science (Biotechnology)
M.Sc. (Biotechnology) Semester (II)

Course Code	PS02EBIT53	Title of the Course	Medical Microbiology
Total Credits of the Course	04	Hours per Week	04

Course Objectives:	<ol style="list-style-type: none"> 1. To train students in the field of Medical Microbiology with details on representative infections caused by Bacteria, Viruses, Parasites, and fungi. 2. Exposure of students to routine and advanced molecular diagnosis techniques for the detection of medically important human microbial pathogens and commonly employed prevention and treatment processes. 3. Training of the students to work as laboratory technicians and assistant pathologist.
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Course Content		
Unit	Description	Weightage* (%)
1.	Basics in Medical Microbiology Sources of infection, Modes of transmission, carriers and their types – investigation of epidemic diseases. Types of infectious diseases, Prevention and Control of Hospital acquired infections. Immunoprophylaxis. Vaccines: Types and their mode of action. Recent advances in diagnostic microbiology: Automation, Nucleic acid based detection methods. Epidemiology: General account, Principle, Scope and application.	25%
2.	Bacteriology Morphology, Cultural Characteristics, Antigenic structures, Pathogenesis, Laboratory Diagnosis, Epidemiology of following bacteria: <i>Staphylococcus</i> , <i>Streptococcus</i> including <i>Pneumococcus</i> , <i>Corynebacterium</i> , <i>Clostridium</i> , <i>Mycobacteria</i> , <i>Vibrios</i> , <i>E. coli</i> , <i>Salmonella</i> , <i>Brucella</i> and <i>Neisseria</i>	25%
3.	Virology The Nature and classification of viruses, Morphology: Virus structure and Virus replication. General properties, diseases caused, lab diagnosis, epidemiology and prevention of: Pox, Hepatitis (HAV & HAB), Orthomyxo (Influenza), Rabdo (Rabies), SARS, MARS, SARS-CoV-2 and HIV virus. Antiviral compounds [chemical and natural products] and their mode of action.	25%





4.	Parasitology & Mycology Parasitology: Laboratory techniques in parasitology. Morphology, life cycle, laboratory diagnosis, epidemiology of following parasites: <i>Parasites: Entamoeba, Giardia, Leishmania, Plasmodium, Helminths: Taenia, Ascaris, Wuchereriabancrofti, Schistosomes</i> Mycology: Morphology, diseases caused, epidemiology and lab diagnosis of:- Opportunistic fungi - <i>Cryptococcus, Candida, AspergillusMucormycosis</i> Fungi causing Cutaneous mycoses- <i>Dermatophytes</i> Subcutaneous mycoses - <i>Mycetoma</i> , Systemic mycoses- <i>Histoplasma</i>	25%
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Teaching-Learning Methodology	Topics will be taught and discussed in interactive sessions using conventional black board and chalk as well as ICT tools such as power point presentations and videos. Practical sessions will be conducted in a suitably equipped laboratory either individually or in groups depending on the nature of exercise as well as availability of infrastructure. Course materials will be provided from primary and secondary sources of information.
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Students will learn basis of virulence factors and pathogenesis of different bacterial, parasitological, viral and mycological diseases and the laboratory diagnosis techniques. They would also understand epidemiological aspects and social impact of some dreadful as well as emerging infections like HIV,MARS, SARS-CoV-2, Mucormycosisetc.
2.	Understand the specimen collection techniques and identification of pathogens by conventional and recent molecular methods.





3.	Students will understand the significance of vaccination, antiviral compound and their mode of action.
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Suggested References:

Sr. No.	References
1.	Textbook of Microbiology by Surinder Kumar
2.	Medical Parasitology by R. Karyakarte.
3.	Text Books of Medical Laboratory Technology by P. B. Godkar.
4.	A Text Book of Medical Microbiology by Anathanarayana&Panikar
5.	A Text Book of Microbiology by P. Chakraborty
6.	Parasitology by Chatterjee, KD
7.	Textbook of medical mycology by JagdishChander,
8.	An Introduction to Viruses by Biswas SB and Biswas

On-line resources to be used if available as reference material

<https://www.cdc.gov/>

<https://www.icmr.gov.in/>

<https://www.swayamprabha.gov.in/index.php/home>

