Course Code: MLC403 **Course Title: Clinical Microbiology**
Number of Credits: 3T + 2P = 5 **(General & Systematic)**
Effective from AY: 2022 -2023

Prerequisite for the Course:	Basic knowledge of cell biology and microbiology	
Objectives:	• Hands-on training on preparation of culture media for isolation of bacteria from blood or body fluid samples provided. • To be aware of diagnostic features of bacteria for reporting the correct results observed after analyses using definite procedures • Learning about the advanced techniques used in recent times to obtain better and faster results to provide immediate treatment.	
Content:	**Module 1: Introduction to microbiology** Historical perspective, the principle of microbiology, microscopes (types and uses), Bacteria: Classification, anatomy, reproduction, growth and nutrition, Sterilization: - methods employed, both physical and chemical, Media used in Microbiology: - Classification, types, constituents, methods of preparation, adjustment of pH, sterilization, Culture methods and antimicrobial sensitivity testing, Hospital acquired infections, Biomedical Waste Management, Inventory and stock, Quality control in Microbiology.	15hrs
	Module 2: Serology Serology: Antigen, antibody, antigen-antibody reaction including flow cytometry, Methods for identification of bacteria (morphology), Methods for identification of bacteria (biochemical), Molecular methods (PCR, Biofire Film Array, LAMP), Automated systems for bacterial identification (MALDI-TOF, VITEK 2), Automated culture techniques, Standard precautions.	15hrs
	Module 3: Systemic (Individual Bacteria) Systemic (Individual Bacteria): Diagnosis features (morphology, cultured characters, biochemical reaction, antigenic characters, pathogenicity and laboratory diagnosis) of Staphylococcus, Streptococcus, Pneumococcus, Neisseria, Corynebacteria, Clostridia, Escherichia coli, Klebsiella species, Salmonella, Shigella, Proteus, Pseudomonas, *Mycobacterium tuberculosis*, *Treponema pallidum*.	15hrs
	Practical Module : • Preparation of smears for staining and fixation from samples and culture media (both liquid and solid media). • Care and use of microscopes (including Fluorescent microscope). • Staining techniques: (Gram staining, zeihl nelson, Fluorescent method): preparation of satins, procedure, reporting of smears,	30 hrs x 2

	principle involved. • Equipments used in sterilization: Description (structure), working principle involved, articles sterilized, advantages and disadvantages. • Culture media: types, constituents of each media, method of preparation, adjustment of pH, sterilization, uses. • Culture techniques: different methods of inoculation from clinical samples and bacterial growth from media. • Antimicrobial sensitivity testing. • Preparation of wet mount and motility of organisms. • Identification of bacteria-morphology and biochemical. • Antigen antibody reactions. • Biomedical waste management. • Standard precautions. • Systemic bacteriology: Practical demonstration of diagnostic features of: o Gram positive organisms. o Gram negative organisms. o Anaerobes, spirochetes. • Mycobacteria.	
Pedagogy:	Lectures/tutorials/assignments/ Presentations/Practicals/ demonstrations.	
Learning Outcome:	By the end of this course, students will be able to 1. Explain the basis of bacterial culture and identification. 2. Correlate the microbial techniques with clinical conditions in humans. 3. Perform various staining techniques and tests for microbial analysis. 4. Process body samples to detect pathogenic bacteria.	
References	REFERENCE BOOKS FOR THEORY & PRACTICAL: 1. Ananthanarayan and Paniker's Textbookj of Microbiology- Latest edition. 2. Essential of Medical Microbiology by Apurba S. Satry and Sandhya Bhat- Latest edition. 3. Complete microbiology by C. P. Baveja and V. Baveja. Latest edition.	