

B.Sc. Medical Microbiology

Programme Summary

Duration: 3 years

Eligibility

10+2 in Science stream

Programme outcome:

- To provide comprehensive knowledge of structure, function and pathological changes of the organs and the clinical correlation of diseases and its pathology .
- To study the Clinical Biochemistry and role of medical microbiologist, ethics, responsibility, safety measure and hazards in clinical biochemistry lab. First aid in laboratory accidents. To understand fundamentals of biochemistry including carbohydrates, lipids, proteins nucleotides, enzymes.
- To provide knowledge of epidemiology, surveillance and control of infections (community & hospital).
- To understand the basic microbial structure and function and characteristics of prokaryotes and eukaryotes .
- To introduce various culture media and their applications.
- To skill the microbial techniques for isolation of pure cultures of bacteria and fungi and to understand concept of sterilization.
- Introduction to principle and application of fundamental laboratory equipments related to microbiological techniques.
- To learn the basic principles of medical microbiology and infectious diseases including mechanism of disease transmission, principles of aseptic practices, and the role of normal micro flora.
- To teach laboratory diagnosis of infectious diseases (cultural, biochemical and sero diagnosis).
- To acquire knowledge of Immune reactions and laboratory tests for detection of antigen and antibodies and its clinical significance.
- To analyze the biological data using bioinformatics tools.

Course outcome:

S. No.	Course Code	Course name	Max marks	Course outcome
1st Year				
1.	BMM-101	Human Anatomy & Physiology	70+30	To learn the Organization of human body and integrated physiology. To impart the knowledge of gross anatomy and histology of organs of respiratory system, digestive system, reproductive system and cardiovascular system. To gain knowledge of anatomy and histology of musculo-skeletal system, classification and functions of bones and muscles. To learn about the mechanism of hormone production, factors controlling it and their mechanism of action.
2.	BMM-102	Basic Pathology	70	To gain the knowledge of Collection, preservation, transport and handling and disposal of blood samples. To understand the various pathological processes and their importance in human disease. Build a basic understanding of Various routes of transport of Microbes to human body and methods of defense. Invasive techniques for diagnosis of acute and chronic microbial infections. Evaluate the ways in which pathology contributes to the understanding of patient presentation in a clinical setting. Introduction to blood banking technology.
3.	BMM-103	Clinical Biochemistry	70	Basic awareness of clinical biochemistry laboratory in respect to equipments and glassware. To study the preparation of standard solutions, buffer solutions and pH determination. To learn the biochemical composition of body fluids and their physiological variations. To gain the knowledge of qualitative tests for glycosuria, pentosuria, galactosuria, proteinuria, microalbuminuria and Bence Jones Proteinuria and their clinical significance. Acquire the knowledge of Classification, nomenclature, structure, general properties and functions of Carbohydrates, Lipids, Proteins, Nucleic acid and Enzymes.
4.	BMM-104	Preventive Medicine & Health Care	70	Role of laboratory in community and hospital infections. Management of patients in infectious diseases hospital (IDH). Awareness of Various national immunization programs and vaccine schedules. Reproductive, Family Planning & Child Health Care Programs. To learn the Bacteriology of water, milk, food and air. Awareness of normal constituents of diet, various diet programs, balance diet and factors responsible for etiology of various nutritional disorders. Role of regular exercise & yoga in prevention and management of various diseases.
5.	BMM-105	Fundamentals of Medical Microbiology	70	To gain Knowledge of the historical background of Microbiology. To understand the Role of medical microbiology in identification and management of various infectious diseases. To Acquire the knowledge of microbial cell structure, classification, growth and metabolism. To appreciate the scope and relevance of medical microbiology.

				<p>To understand the Collection, transport processing & storage of clinical samples for microbiological analysis.</p> <p>To learn Introduction of bacteriology, virology, mycology and parasitology.</p> <p>To gain knowledge and develop skills of general microbiological techniques (isolation, cultivation and preservation methods).</p> <p>To learn about Disinfectants, antiseptics, chemotherapeutic agents, future development of chemotherapy, antibiotics and effect of antibiotics on protein, nucleic acid and cytoplasmic membrane.</p>
6.	BMM-106	Instrumentation Techniques in Medical Microbiology	70	<p>To learn in detail about Principles and applications of Microscopy.</p> <p>To be skilled on the basic instruments used in microbiology and immunology.</p> <p>To learn about the basic staining techniques used in microbiology .</p> <p>To gain knowledge and develop skills of Care and management of experimental animals This helps to understand the use of lab animals in medical field.</p> <p>To document the results of Culture, isolation and identification of pathogens from urine, pus and sputum.</p>
		03 Practicals (Course 1&2=1; 3&4=1; 5&6=1)		<p>To impart practical knowledge and hands on training based on courses BMM-101 and BMM-102</p> <p>To impart practical knowledge and hands on training based on courses BMM-103 and BMM-104</p> <p>To impart practical knowledge and hands on training based on courses BMM-105 and BMM-106</p>
2nd Year				
6.	BMM-201	Bacterial Pathogens & Associated Diseases	70	<p>To learn infectious disease transmission, principles of aseptic practice, and the role of the human body's normal microflora.</p> <p>To provide knowledge regarding mechanism of pathogenesis.</p> <p>To learn in detail account of pathogenicity, mode of infection, incubation period and toxigenicity of various gram positive and gram negative bacteria.</p> <p>To gain knowledge of antigenic properties of Protein, carbohydrate, lipids and nucleic acid .</p>
7.	BMM-202	Systematic Bacteriology	70	<p>To learn the management and quality control of medical microbiology laboratory.</p> <p>To provide knowledge regarding Specimen collection from patients, clinics and hospitals for epidemiological investigations.</p> <p>Training of medical microbiologist to handle epidemics.</p> <p>To learn in detail account of morphology, staining, cultural character of bacteria.</p> <p>To learn selective cultural media, identification by special tests, biochemical reactions and stereotyping of various gram-positive and gram-negative bacteria.</p> <p>To learn the microbial drugs sensitivity test and its clinical interpretation.</p>
8.	BMM-203	Misc. Microbes, Fungal Pathogens & Ass. Diseases	70	<p>To understand the Principle and mode of action of antibiotics, antifungal and antiviral agents.</p> <p>To study the detail accounts of description, pathogenicity, mode of infection, incubation period and toxigenicity of Bacteroides, Streptobacilli, Donovanias, Lactobacillus, Actinomyces, Treponema, Borrelia, Mycoplasma, Chlamydia and Rickettsiae.</p> <p>To learn the superficial and deep fungal infections of eye, ear and skin.</p>

9.	BMM-204	Lab Diagnosis of Microbial	70	To understand the importance of pathogenic bacteria in human disease with respect to infections of the respiratory tract, gastrointestinal tract, urinary tract, skin and soft tissue. To learn in detail Itiopathogenesis, pathology, clinical features and lab diagnosis of Aspergillosis, Cryptococcosis, Candidiasis, Blastomycosis, ringworms and mycetoma.
10.	BMM-205	Human Parasitology	70	To learn the Introduction and Classification of different parasitic diseases. To study the detail account of lab diagnostic procedures and special methods of demonstrations of human parasites in blood, stool, tissue and other body fluids.
11.	BMM-206	Applied Medical Microbiology	70	It provides opportunities to develop informatics and diagnostic skills, including the use and interpretation of laboratory tests in the diagnosis of common infections and infestations. To impart knowledge regarding portal regulation and transport of specimen. To study the epidemiology markers of microorganisms (Serotyping and bacteriophages). To understand the specific serological methods of diagnosis. To learn the test of sensitivity to antimicrobial agents and their preparation.
		03 Practical (Course 1&2=1; 3&4=1; 5&6=1)		To impart practical knowledge and hands on training based on courses BMM-201 and BMM-202 To impart practical knowledge and hands on training based on courses BMM-203 and BMM-204 To impart practical knowledge and hands on training based on courses BMM-205 and BMM-206
3rd Year				
12.	BMM-301	Pathogenic Viruses and Associated Diseases	70	To learn the essential concepts of virology which include the structure of different viruses, properties, replication and classification of virus. To understand the different methods of viral cultivation such as tissue culture, embryonated egg and animal inoculations. To gain knowledge about the clinical features, etiology, pathogenesis and methods of laboratory diagnosis of viral infections and apply that knowledge in the treatment, prevention and control of communicable diseases caused by viruses.
13.	BMM-302	Applied immunology & Serodiagnosis	70	To gain the knowledge of immune reactions and laboratory tests for detection of antigen and antibodies. To study the Clinical significance of tumor markers and hepatitis markers. To learn the Pathogenesis and clinical feature of Autoimmune disorders markers. To be trained in Industrial production of antibiotics and vaccines. To deliver knowledge of Widal, ASO, CRP, Rose Waller, Rubella-Agglutination, cold agglutination, VDRL, TPHA and STS.
14.	BMM-303	Advanced Diagnostic Technology	70	Ability to develop and perform a range of diagnostic techniques relevant to the field of laboratory medicines. To study the classification, morphological groups and applications of bacteriophages in medical microbiology. To gain knowledge of principles, technology and applications of DNA replication, translation and transduction in diagnosis. To learn the various immunological techniques such as IgM to HB core antigen ,IgG to Hepatitis C

				virus, IgG to Hepatitis A virus, Cystecercosis IgG, Chlamydia IgM, IgG, IgA, IgM combined rapid test and dengue IgM in diagnosis of diseases.
15.	BMM-304	Automation & Computerization in Medical Micro.	70	To Acquire the knowledge of computer Hardware central Processing Unit (CPU), input drives, storage and output devices, binary decimal, octal and hexadecimal systems, BCD, EBCDIC and ASCII coding systems. To learn the Computer Application and their use in Medical Microbiology. To understand the Basic guidelines for medical transcription. To study the automation in Medical Microbiology Laboratory.
16.	BMM-305	Molecular Biology & Clinical Lab.	70	To gain the knowledge of blood glucose, liver function, blood urea and cardiac profile tests. To learn the organization, operation, administration, quality assurance and safety measures in Blood Banking. To understand the definition, classification, pathogenesis and diagnostic procedures of anemia and leukemia. To impart the knowledge of histopathology and histochemistry. To understand the Theories of Blood Coagulation & Diagnostic procedures for Coagulation disorders.
		03 Practicals (Course 1&2=1; 3&4=1; 5=1)		To impart practical knowledge and hands on training based on courses BMM-301 and BMM-302 To impart practical knowledge and hands on training based on courses BMM-303 and BMM-304 To impart practical knowledge and hands on training based on courses BMM-305 and BMM-306