



MGM INSTITUTE OF HEALTH SCIENCES

(Deemed to be University u/s 3 of UGC Act, 1956)

Grade 'A' Accredited by NAAC

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COMPETENCY BASED MEDICAL EDUCATION (CBME)

(with effect from 2019-2020 Batches)

Curriculum for Second M.B.B.S Microbiology

Amended upto AC-46/2023, Dated 28/04/2023

Amended History

1. Approved as per BOM 57/2019 [Resolution no. 3.1.1.13], Dated 26/04/2019.
2. Amended upto BOM 62/2020 [Resolution No. 3.2.2.1, Resolution No. 3.2.2.11], Dated 16/09/2020.
3. Amended upto BOM 63/2021 [Resolution No. 4.4.1.2.i], Dated 17/02/2021.
4. Amended upto AC-41/2021 [Resolution No. 4.15], Dated 27/08/2021.
5. Amended upto AC-44/2022 [Resolution No. 5.18], Dated 09/12/2022.
6. Amended upto AC-46/2023 [Resolution No. 5.14], dated 28/04/2023

IInd MBBS CBME Curriculum

Microbiology

| Lectures | SGT/ SEM/ CD/ DOAP/ Integration | SDL | TOTAL |
|----------|------------------------------------|--------|---------|
| 70 hrs | 110 hrs | 10 hrs | 190 hrs |

List of Lectures (70 Hrs):

| No | COMPETENCY The student should be able to | | Lectures | No of Hrs |
|---|--|---|---|------------------|
| Topic: General Microbiology and Immunity | | Number of competencies: (11) | | Number of |
| | | procedures that require certification : (01) | | |
| MI 1.1 | Describe the different causative agents of Infectious diseases+A208the methods used in their detection | L | 1. history of Microbiology 2. Bacterial Morphology 3. Physiology and Metabolism of bacteria 4. Culture Methods 5. General Virology 6. General Parasitology 7.General Mycology | 7Hrs |
| MI1.3 | Describe the epidemiological basis of common infectious diseases | L | 8. Infection | 1 Hr |
| MI1.4 | Classify and describe the different methods of sterilization and disinfection. Discuss the application of the different methods in the laboratory, in clinical and surgical practice | L | 9. Sterilisation 10. Disinfection | 2 Hrs |
| MI1.6 | Describe the mechanisms of drug resistance, and the methods of antimicrobial susceptibility testing and monitoring of antimicrobial therapy | L | 11. Bacterial Genetics 1 12. Bacterial Genetics 2 | 2 Hrs |
| MI1.7 | Describe the immunological mechanisms in health | L | 13. Immunity 14. Antigen 15. Antibody 16. Complement | 4 Hrs |
| MI1.8 | Describe the mechanisms of immunity and response of | L | 17. Structure and Function of Immune System 18. AMI and CMI | 2 Hr |

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| | the host immune system to infections | | | |
| MI1.9 | Discuss the immunological basis of vaccines and describe the Universal Immunisation schedule | L | 19. Immunoprophylaxis | 1 Hr |
| MI1.10 | Describe the immunological mechanisms in immunological disorder (hypersensitivity, autoimmune disorders and immunodeficiency states) and discuss the laboratory methods used in detection. | L | 20. Hypersensitivity 21. Autoimmunity | 2 Hrs |
| MI1.1 1 | Describe the immunological mechanisms of transplantation and tumor immunity | L | 22. Transplantation 23. Tumour Immunity and IDD | 2 Hrs |
| | TOTAL | | 23 | 23 Hrs |
| Topic: CVS and Blood Number of competencies: (7) Number of procedures that require certification : (NIL) | | | | |
| MI2.1 | Describe the etiologic agents in rheumatic fever and their diagnosis | L | | 2hrs |
| MI2.2 | Describe the classification etio-pathogenesis, clinical features and discuss the diagnostic modalities of Infective endocarditis | L | 1. Streptococcus, 2. Pneumococcus and Enterococcus | |
| MI2.4 | List the common microbial agents causing anemia. Describe the morphology, mode of infection and discuss the pathogenesis, clinical course diagnosis and prevention and treatment of the common microbial agents causing Anemia | L | 3. Dengue and Chickungunya | 1 hr |
| MI2.5 | Describe the etio-pathogenesis and discuss the clinical evolution and the laboratory diagnosis of kalaazar, malaria, filariasis and other common parasites prevalent in India | L | 4. Trypanosoma 5. Filaria 6. Leishmania (Kala Azar) | 3 hrs |
| MI2.7 | Describe the epidemiology, the etio- pathogenesis, evolution complications, opportunistic infections, | L | 7. HIV | 1 hr |

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| | diagnosis, prevention and the principles of management of HIV | | | |
| | TOTAL | | 7 | 7 Hrs |
| Topic: Gastrointestinal and hepatobiliary system that require certification : (NIL) | | | Number of competencies: (8) | Number of procedures |
| MI3. 1 | Enumerate the microbial agents causing diarrhea and dysentery. Describe the epidemiology, morphology, pathogenesis, clinical features and diagnostic modalities of these agents | L | 1. E.coli, Proteus, Klebsiella 2. Vibrio 3. E.histolytica 4. Taenia 5. Ascaris, Hookworm Trichuris, E Vermicularis, Strongyloides | 5 hrs |
| MI3. 3 | Describe the enteric fever pathogens and discuss the evolution of the clinical course and the laboratory diagnosis of the diseases caused by them | L | 6. Enteric Fever and Non typhoidal salmonella | 1 hr |
| MI3. 5 | Enumerate the causative agents of food poisoning and discuss the pathogenesis, clinical course and laboratory diagnosis | L | | |
| MI3. 6 | Describe the etio-pathogenesis of Acid peptic disease (APD) and the clinical course. Discuss the diagnosis and management of the causative agent of APD | L | 7. H.pylori, campylobacter and Cl.difficile | 1 hr |
| MI3. 7 | Describe the epidemiology, the etio-pathogenesis and discuss the viral markers in the evolution of Viral hepatitis. Discuss the modalities in the diagnosis and prevention of viral hepatitis | L | 8. Hepatitis | 1hr |
| | TOTAL | | 8 | 8 hrs |
| Topic: Musculoskeletal system skin and soft tissue infections of procedures that require certification : (NIL) | | | Number of competencies: (3) | Number |
| MI4.1 | Enumerate the microbial agents causing anaerobic infections. Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of anaerobic infections | L | 1. Cl.perfringens 2. Cl.tetani and Cl.botulinum | 2 hrs |

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| MI4.2 | Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of bone & joint infections | L | 3. Staphylococcus | 1 hr |
| MI4.3 | Describe the etiopathogenesis of infections of skin and soft tissue and discuss the clinical course and the laboratory diagnosis | L | 4. M leprosy 5. Dermatophytes 6. Actinomycetes | 3 hrs |
| | TOTAL | | 6 | 6 hrs |
| Topic: Central Nervous System infections Number of competencies: (3) Number of procedures that require certification : (NIL) | | | | |
| MI5.1 | Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of meningitis | L | 1. H.influenzae 2. Cryptococcus and Mucor 3. Toxoplasma | 3 hrs |
| MI5.2 | Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of encephalitis | L | 4. polio virus 5. Rabies Virus | 2hrs |
| | TOTAL | | 5 | 5 hr |
| Topic: Respiratory tract infections Number of competencies: (3) Number of procedures that require certification : (02) | | | | |
| MI6.1 | Describe the etiopathogenesis, laboratory diagnosis and prevention of Infections of upper and lower respiratory tract | L | 1. C.Diphtheria 2. M.Tb 3. Atypical Mycobacteria 4. Bordatella 5. Mycoplasma and Chlamydia 6. Orthomyxo virus 7. Paramyxovirus | 7 hrs |
| | TOTAL | | 7 | 7 hr |
| Topic: Genitourinary & Sexually transmitted infections Number of competencies: (3) Number of procedures that require certification : (NIL) | | | | |
| MI7.1 | Describe the etiopathogenesis and discuss the laboratory diagnosis of infections of genitourinary system | L | 1. Gonococci and NGU 2. Herpes and CMV | 2 hrs |
| MI7.2 | Describe the etiopathogenesis and discuss the laboratory diagnosis of sexually transmitted infections. Recommend preventive measures | L | 3. T pallidum | 1 hr |
| MI7.3 | Describe the etiopathogenesis, clinical | L | 4. UTI | 1 hr |

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| | features, the appropriate method for specimen collection, and discuss the laboratory diagnosis of Urinary tract infections | | | |
| | TOTAL | | 4 | 4 hr |
| Topic: Zoonotic diseases and miscellaneous Number of competencies: (16) Number of procedures that require certification : (01) | | | | |
| MI8.1 | Enumerate the microbial agents and their vectors causing Zoonotic diseases. Describe the morphology, mode of transmission, pathogenesis and discuss the clinical course laboratory diagnosis and prevention | L | 1. Yersinia 2. Leptospira and Borrelia 3. E. granulosus | 3 hrs |
| MI8.2 | Describe the etio-pathogenesis of opportunistic infections (OI) and discuss the factors contributing to the occurrence of OI, and the laboratory diagnosis | L | 4. Candida 5. Histoplasma and Other dimorphic fungi | 2 hrs |
| MI8.3 | Describe the role of oncogenic viruses in the evolution of virus associated malignancy | L | 6. Oncogenic Viruses and emerging and re emerging infections | 1hr |
| MI8.4 | Describe the etiologic agents of emerging Infectious diseases. Discuss the clinical course and diagnosis | L | | |
| MI8.5 | Define Healthcare Associated Infections (HAI) and enumerate the types. Discuss the factors that contribute to the development of HAI and the methods for prevention | L | 7. Pseudomonas and HAI and its control | 1hr |
| MI8.6 | Describe the basics of Infection control | L | | |
| MI8.8 | Describe the methods used and significance of assessing the microbial contamination of food, water and air | L | 8. Microbiology of Food, water and Air | 1 hr |
| MI8.9 | Discuss the appropriate method of collection of samples in the performance of laboratory tests in the | L | 9. Collection of Sample | 1 hr |

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| | detection of microbial agents causing infectious diseases | | | |
| MI8.12 | Discuss confidentiality pertaining to patient identity in laboratory results | L | 10. National Health Programs in the prevention of common infectious disease and Bioethics: Universal Safety Principles | 1hr |
| MI8.16 | Describe the National Health Programs in the prevention of common infectious disease (for information purpose only as taught in CM) | L | | |
| | TOTAL | | 10 | 10 hrs |

System wise Total of Lectures:

| Sr No | Systems | No of Lecture | Hrs |
|-------|---|---------------|---------------|
| 1 | Gen Microbiology and Immunology | 23 | 23 |
| 2. | CVS and Hematology | 7 | 7 |
| 3. | GIT and Hepatobiliary | 8 | 8 |
| 4. | Musculoskeletal and Skin soft tissue | 6 | 6 |
| 5. | Central Nervous system | 5 | 5 |
| 6. | Respiratory System | 7 | 7 |
| 7. | Genitourinary and Sexually transmitted Infections | 4 | 4 |
| 8. | Zoonotic and Miscellaneous | 10 | 10 |
| | TOTAL | 70 | 70 Hrs |

LIST of SGTs/ Sem/ Integrated/ DOAP: (110 Hrs)

| No | COMPETENCY The student should be able to | SGT/Sem/Case/Integrated | No of Hrs | Practical DOAP | No of Hrs |
|---|--|---|--------------|--|--------------|
| Topic: General Microbiology and Immunity Number of competencies: (11) procedures that require certification : (01) Number of | | | | | |
| MI 1.1 | Describe the different causative agents of Infectious diseases+ A208 the methods used in their detection | 1. Culture Medias (SG) 2. Biochemicals (SG) | 2 hrs | | |
| MI1.2 | Perform and identify the different causative agents of Infectious diseases by Gram Stain, ZN stain and stool routine microscopy | - | | 1. Diagnostic Microbiology 1 2. Morphology of Bacteria 3. Microscopy 4. Gram staining 5. ZN Staining | 10 hrs |
| MI1.4 | Classify and describe the different methods of sterilization and disinfection. Discuss the application of the different methods in the laboratory, in clinical and surgical practice | | | 6. Sterilisation and Disinfection | 2 hrs |
| MI1.5 | Choose the most appropriate method of sterilization and disinfection to be used in specific situations in the laboratory, in clinical and surgical practice | 3. Disinfection (Lab, OT, OPD) (Integrated) | 1 hr | | |
| MI1.6 | Describe the mechanisms of drug resistance, and the methods of antimicrobial susceptibility testing and monitoring of antimicrobial therapy | 4. Bacteriophage (Sem) 5. Minimisation of Drug Resistance and antibiotic Policy (SG) | 2 hrs | 7. Diagnostic Microbiology 2 and Gram Staining 8. ZN Staining (repeat) | 4hrs |
| MI1.7 | Describe the immunological mechanisms in health | | | 9. Serological Reactions 1 | 4 hrs |
| MI1.8 | Describe the mechanisms of immunity and response of the host immune system to infections | | | 10. Serological reactions 2 | |
| | TOTAL | 5 | 5 Hrs | 10 | 20hrs |

| Topic: CVS and Blood certification : (NIL) | | Number of competencies: (7) | Number of procedures that require certification : (NIL) | | |
|---|--|--|--|---|-------------|
| MI2.1 | Describe the etiologic agents in rheumatic fever and their diagnosis | 1. Causative agents of Rheumatic Fever and its diagnosis (Integrated) | 1 hr | | |
| MI2.2 | Describe the classification etio-pathogenesis, clinical features and discuss the diagnostic modalities of Infective endocarditis | 2. classification etio-pathogenesis, clinical features and discuss the diagnostic modalities of Infective endocarditis (Sem) | 1 hr | | |
| MI2.3 | Identify the microbial agents causing Rheumatic Heart Disease & infective Endocarditis | | | 1. Streptococcus, Pneumococcus and Enterococcus | 2hrs |
| MI2.4 | List the common microbial agents causing anemia. Describe the morphology, mode of infection and discuss the pathogenesis, clinical course diagnosis and prevention and treatment of the common microbial agents causing Anemia | 3. Rickettsia (SG) | 1hr | | |
| MI2.5 | Describe the etio-pathogenesis and discuss the clinical evolution and the laboratory diagnosis of kalaazar, malaria, filariasis and other common parasites prevalent in India | 4. Integrated : Malaria | 2 hrs | | |
| MI2.6 | Identify the causative agent of malaria and filariasis | | | 2. Blood protozoa | 2 hrs |
| MI2.7 | Describe the epidemiology, the etio- pathogenesis, evolution complications, opportunistic infections, diagnosis, prevention and the principles of management of HIV | 5.Integrated: HIV | 2 hrs | | |
| | TOTAL | 5 | 7 Hrs | 2 | 4hrs |
| Topic: Gastrointestinal and hepatobiliary system | | Number of competencies: (8) | Number of procedures that require certification : (NIL) | | |

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|---|---|--|------------------------------------|--|---------------|
| MI3. 1 | Enumerate the microbial agents causing diarrhea and dysentery. Describe the epidemiology, morphology, pathogenesis, clinical features and diagnostic modalities of these agents | 1. Shigella (SG) 2. Isospora , Cryptospora (Sem) 3. Giardia (Sem) | 3hrs | 1. Enterobacteriaceae (E coli, Proteus, Klebsiella) 2. Vibrio and Shigella 3. Intestinal Nematodes and Stool Examination | 6 hrs |
| MI3. 2 | Identify the common etiologic agents of diarrhea and dysentery | | | 4. Intestinal Protozoa and Stool Examination | 2hrs |
| MI3. 4 | Identify the different modalities for diagnosis of enteric fever. Choose the appropriate test related to the duration of illness | | | 5. Salmonella | 2hrs |
| MI3. 5 | Enumerate the causative agents of food poisoning and discuss the pathogenesis, clinical course and laboratory diagnosis | 4. Food Poisoning (Integrated) | 2hr | | |
| MI3. 7 | Describe the epidemiology, the etio-pathogenesis and discuss the viral markers in the evolution of Viral hepatitis. Discuss the modalities in the diagnosis and prevention of viral hepatitis | 5. Liver Fluke (SG) 6. Integrated: Hepatitis | 2hrs | | |
| MI3. 8 | Choose the appropriate laboratory test in the diagnosis of viral hepatitis with emphasis on viral markers | | | 6. Diagnostic tests used in Virology | 2hrs |
| | TOTAL | 6 | 7Hrs | 6 | 12 hrs |
| Topic: Musculoskeletal system skin and soft tissue infections of procedures that require certification : (NIL) | | | Number of competencies: (3) | | Number |
| MI4.1 | Enumerate the microbial agents causing anaerobic infections. Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of anaerobic infections | 1. Non sporing anaerobes (SG) | 1hr | 1. Clostridia and Non sporing anaerobes | 2 hrs |

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| MI4.2 | Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of bone & joint infections | | | 2. Staphylococcus | 2 hrs |
| MI4.3 | Describe the etiopathogenesis of infections of skin and soft tissue and discuss the clinical course and the laboratory diagnosis | 2. Pox Virus (Sem) 3. Mycetoma and S/c Mycosis (Integrated) 4. B anthracis (Integrated) | 3hrs | 3. Mycology 4. M leprae 5. Bacillus | 6 hrs |
| | TOTAL | 4 | 4hrs | 5 | 10 hrs |
| Topic: Central Nervous System infections Number of competencies: (3) Number of procedures that require certification : (NIL) | | | | | |
| MI5.1 | Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of meningitis | 1. Meningococcus and Meningitis (Integrated) | 1hr | | |
| MI5.2 | Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of encephalitis | 2. Slow Viral Diseases (SEM) | 1hr | | |
| MI5.3 | Identify the microbial agents causing meningitis | | | 1. Microbial agents causing Meningitis (Meningococcus) | 2 hrs |
| | TOTAL | 2 | 2hrs | 1 | 2 hrs |
| Topic: Respiratory tract infections Number of competencies: (3) Number of procedures that require certification : (02) | | | | | |
| MI6.1 | Describe the etiopathogenesis, laboratory diagnosis and prevention of Infections of upper and lower respiratory tract | 1. Tuberculosis (Integrated) 2. Lung fluke (SEM) 3. Legionella (SEM) 4. Aspergillus (SG) 5. Other opportunistic fungi (SG) 6. Adenovirus (SEM) | 6hrs | | |
| MI6.2 | Identify the common etiologic agents of upper respiratory tract infections (Gram Stain) | | | 1. C diphtheria and Gram staining | 6 hrs |
| MI6.3 | Identify the common etiologic agents of lower respiratory tract infections (Gram Stain & Acid fast) | | | 2. Bordatella and Hemophilus 3. M tuberculosis and ZN staining | |

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| | stain) | | | | |
| | TOTAL | 6 | 6hrs | 3 | 6 hrs |
| Topic: Genitourinary & Sexually transmitted infections Number of competencies: (3) Number of procedures that require certification : (NIL) | | | | | |
| MI7.1 | Describe the etio-pathogenesis and discuss the laboratory diagnosis of infections of genitourinary system | 1. T vaginalis (SEM) | 1hr | 1.Gonococcus | 2hrs |
| MI7.2 | Describe the etio-pathogenesis and discuss the laboratory diagnosis of sexually transmitted infections. Recommend preventive measures | 2. STDs (Integrated) | 1hr | 2. Spirochaetes | 2 hrs |
| MI7.3 | Describe the etio-pathogenesis, clinical features, the appropriate method for specimen collection, and discuss the laboratory diagnosis of Urinary tract infections | 3. UTI (SEM) | 1hr | | |
| | TOTAL | 3 | 3hrs | 2 | 4hrs |
| Topic: Zoonotic diseases and miscellaneous Number of competencies: (16) Number of procedures that require certification : (01) | | | | | |
| MI8.1 | Enumerate the microbial agents and their vectors causing Zoonotic diseases. Describe the morphology, mode of transmission, pathogenesis and discuss the clinical course laboratory diagnosis and prevention | 1. Zoonosis and Brucella (SG) | 1hr | 1. Yersinia and Brucella | 2 hrs |
| MI8.4 | Describe the etiologic agents of emerging Infectious diseases. Discuss the clinical course and diagnosis | 2. Emerging and Re-emerging infections (Integration) 3. Misc bacteria (SEM) | 2 hr | | |
| MI8.5 | Define Healthcare Associated Infections (HAI) and enumerate the types. Discuss the factors that contribute to the development of HAI and the | 4. HAI (SEM) 5. Integrated: PUO | 1hrs 2 hrs | | |

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| | methods for prevention | | | | |
| MI8.6 | Describe the basics of Infection control | 6. Infection Control (Integration) | 1hrs | | |
| MI8.7 | Demonstrate Infection control practices and use of Personal Protective Equipments (PPE) | | | 2. Pseudomonas and HAI and PPE | 2 hrs |
| MI8.8 | Describe the methods used and significance of assessing the microbial contamination of food, water and air | | | | |
| MI8.9 | Discuss the appropriate method of collection of samples in the performance of laboratory tests in the detection of microbial agents causing infectious diseases | 7. Biomedical waste Disposal (SG) | 1Hrs | | |
| MI8.10 | Demonstrate the appropriate method of collection of samples in the performance of laboratory tests in the detection of microbial agents causing Infectious diseases | | | 3. Collection of samples and Medical Entomology | 2 hrs |
| MI8.11 | Demonstrate respect for patient samples sent to the laboratory for performance of laboratory tests in the detection of microbial agents causing Infectious diseases | 8. confidentiality pertaining to patient identity in laboratory results (SG) | 1hr | | |
| MI8.12 | Discuss confidentiality pertaining to patient identity in laboratory results | | | | |
| MI8.13 | Choose the appropriate laboratory test in the diagnosis of the infectious disease | 9. Appropriate laboratory test in the diagnosis of the infectious disease (SEM) | 1hr | | |
| MI8.15 | Choose and Interpret the results of the laboratory tests used in diagnosis of the infectious disease | 10. Molecular tests (SG) 11. Serological Reactions (SG) | 1hr 1hr | | |
| | TOTAL | 11 | 12 hrs | 3 | 6hrs |

Pandemic Module in Microbiology

| Pandemic Module 2.1 | Hours already allotted in Syllabus |
|--|---|
| <p>Infection Control: Part II Air borne precautions Contact Precautions</p> <p>Infection Control Committee</p> | <p>MI 8.6: Describe the basics of Infection control</p> <ul style="list-style-type: none"> • 1Hr- Lecture (Interactive session) • 1 Hr- Integrated session (Debriefing and Feedback) <p>MI 8.8: Describe the methods used and significance of assessing the microbial contamination of food, water and air</p> <ul style="list-style-type: none"> • 1 Hr – Lecture (Case discussion)) <p>MI 6.3: Identify the common etiologic agents of lower respiratory tract infections</p> <ul style="list-style-type: none"> • 2hr DOAP Bordatella and Heamophillus (Visit to Isolation ward/ Video/ Photos of Isolation ward) |
| Pandemic Module 2.3 | Hours already allotted in Syllabus |
| <p>Sample Collection, Microbial diagnosis, Serologic testsand their performanceparameters</p> | <p>MI 8.9: Discuss the appropriate method of collection of samples in the performance of laboratory tests in the</p> <ul style="list-style-type: none"> • 1 Hr lecture (Interactive session) • 1 SGT <p>MI 8.10: Demonstrate the appropriate method of collection of samples in the performance of laboratory tests in the detection of microbial agents causing Infectious diseases</p> <ul style="list-style-type: none"> • 2Hrs DOAP (Sample collection and Visit to lab) |

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| | <p>MI8.15 and MI 8.13:Choose and Interpret the results of the laboratory tests used in diagnosis of the infectious disease</p> <ul style="list-style-type: none">• 2 hrs SGT (small group activity)• 1 hr Seminar (Discussion and closure) |
|--|---|

System wise Total SGTs/ Sem/ Integrated/ DOAP:

| Sr No | Systems | No of SGT/ Seminars/ | Hrs | DOAP session/Practicals | Hrs |
|-------|---|----------------------|---------------|-------------------------|---------------|
| 1 | Gen Microbiology and Immunology | 5 | 5 | 10 | 20 |
| 2. | CVS and Hematology | 5 | 7 | 2 | 4 |
| 3. | GIT and Hepatobiliary | 6 | 7 | 6 | 12 |
| 4. | Musculoskeletal and Skin soft tissue | 4 | 4 | 5 | 10 |
| 5. | Central Nervous system | 2 | 2 | 1 | 2 |
| 6. | Respiratory System | 6 | 6 | 3 | 6 |
| 7. | Genitourinary and Sexually transmitted Infections | 3 | 3 | 2 | 4 |
| 8. | Zoonotic and Miscellaneous | 11 | 12 | 3 | 6 |
| | TOTAL | 42 | 46 Hrs | 32 | 64 Hrs |
| | GRAND TOTAL | 110 hrs | | | |

L: Lecture SG: Small Group CD: Case Discussion SEM: Seminar DOAP: Demonstrate, Observe, Assess and Perform

SDL (Self Directed Learning):

| Sr No | Topics | No of Hrs |
|-------|--------------------------------|---------------|
| 1 | ELISA test | 1hr |
| 2 | Widal test | 1hr |
| 3 | Needle stick Injury | 1Hr |
| 4 | Hand Hygiene | 1Hr |
| 5 | MRSA Surveillance | 1hr |
| 6 | Antibiotic Sensitivity testing | 1hr |
| 7 | Antimicrobial agents | 1hr |
| 8 | Viral Vaccines | 1hr |
| 9 | Malarial Vaccines | 1hr |
| 10 | Free living amoeba | 1hr |
| | Total | 10 Hrs |

Resolution No. 3.2.2.1 of BOM-62/2020: Resolved to approve the restructured Formative and Summative assessment pattern for 2nd MBBS Para-Clinical disciplines (Microbiology, Pathology, Pharmacology and FMT) which is in line with Competency Based Medical Education (CBME) curriculum guidelines as mandated by MCI. [Annexure-46A, 46B, 46C, 46D]

Format for Internal assessment examinations

Resolution No. 5.14 of Academic Council (AC-46/2023): Resolved to approve change in assessment pattern (university & IA) for calculation of internal assessment of theory & practical in microbiology in both institutions with effect from admission Batch Feb 2022 onwards [ANNEXURE-18].

| Sr. No. | Exam | Theory | Practical |
|--------------|---|------------|------------|
| 1. | 1 st Internal assessment examination | 100 | 100 |
| 2. | 2 nd Internal assessment examination | 100 | 100 |
| 2. | Preliminary examination | 200 | 100 |
| Total | | 400 | 300 |

- Preliminary examination pattern will be as per University examination
- Respective colleges/ departments will conduct internal assessment examinations and maintain records of the same.

Resolution No. 5.18 of Academic Council (AC-44/2022): It was resolved to approve:

a) Change in the Day to Day assessment pattern for internal assessment calculations according to NMC norms in all paraclinical subjects.

b) Day to Day assessment for theory can be conducted online in the form of Google forms having structured questions like MCQ, one liners, Picture based questions (20 questions for 20 marks).

c) Day to Day assessment for Practical can be conducted as defined OSPE station /practical /Clinical test /DOPS (20 Marks).

All above said changes are to be implemented in the programme UG-MBBS in all Paraclinical Subjects for Theory & Practical with effect from the batch admitted in Academic Year 2022-23 onwards.

It was further resolved that suitable validation exercise must be undertaken for all online formats. [ANNEXURE-21A, 21B, 21C & 21D].

Format of question
Preliminary & University

Paper Time – 3 hrs.

Each subject – 2 papers (I / II) – 100 X 2 = **Total 200 Marks**

Portion:

| | |
|---------|--|
| Paper 1 | General Microbiology, Immunology, CVS& Blood, GI & Hepatobiliary, Musculoskeletal, skin & soft tissue infections, Aetcom module 2.4 |
| Paper 2 | CNS infections, Respiratory Tract Infections, Genitourinary Infections & STIs, Zoonotic & Miscellaneous, Aetcom module 2.5, Pandemic Modules |

Theory Paper Pattern and Marks Distribution: (3hrs)

| Paper | Section | Type and Number of Questions | Marks allotted | Total Marks |
|----------------|-----------|--|--|-------------|
| Paper 1 | Section A | MCQs (20) Gen Micro and Immuno-5 | 20 X 1mk each= 20Mks | 20 |
| | | CVS & Blood-5 GI and Hepatobiliary-5 Musculo, skin and Subcut-5 | | |
| | Section B | SAQs (5/6) (1 SAQ compulsory from Aetcom) LAQs (1/2) (Atleast 1 LAQ clinical Based) | 5X 6 Mks each =30 Mks 1X 10 Mks each=10 Mks | 40 |

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|--------------|-----------|--|--|------------|
| | Section C | SAQs (5/6) (1 SAQ compulsory from Aetcom) LAQs (1/2) (Atleast 1 LAQ clinical Based) | 5X 6 Mks each =30 Mks 1X 10 Mks each=10 Mks | 40 |
| TOTAL | | | | 100 |

| Paper | Section | Type and Number of Questions | Marks allotted | Total Marks |
|----------------|----------------|--|--|--------------------|
| Paper 2 | Section A | MCQs (20) CNS-5 Resp Tract-5 Genitourinary and STIs-5 Zoonotic and Misc-4 Pandemic Module-1 | 20 X1mk each= 20Mks | 20 |
| | Section B | SAQs (5/6) (1 SAQ compulsory from AETCOM) | 5X 6 Mks each =30 Mks 1X 10 Mks each=10 | 40 |
| | | LAQs (1/2) (Atleast 1 LAQ clinical Based) | Mks | |
| | Section C | SAQs (5/6) LAQs (1/2) (Atleast 1 LAQ clinical Based) | 5X 6 Mks each =30 Mks 1X 10 Mks each=10 Mks | 40 |
| TOTAL | | | | 100 |

Summative (University Exam) and Prelim Exam
Practical's Pattern and Marks Distribution:

| | |
|-------------------|--------|
| Grams Staining | 10Mks |
| ZN Staining | 10 Mks |
| Stool examination | 10 Mks |
| Spots | 10 Mks |
| Clinical Case (1) | 20Mks |
| OSPE | 10 Mks |
| Viva 1 | 15Mks |
| Viva 2 | 15Mks |
| TOTAL | 100Mks |

OSPE

- **Time:** 5 minutes
- **No of stations:** 1 station
- **Level of assessment:** Psychomotor / cognitive / Soft skill
- **Marks:** 10 marks

Individual check list to be prepared for each station.

INTERNAL EXAMS

There will be 2 Internal Exams besides prelims

There will be only one theory paper for both Internal Exams.

Prelims will be exactly like University exam

1st Internal Exam: End of January (Theory 100Mks, Practicals 100Mks)

2nd Internal Exam: End of April (Theory 100 Mks, Practicals 100Mks)

Portion for Internal Exams:

1st Internal Exam:

General Microbiology , Immunology, CVS and Blood infections (Except Malaria and HIV)

2nd Internal Exam:

HIV, Malaria, Gastrointestinal and Hepatobiliary infections, Respiratory tract Infections

Prelims:

| | |
|---------|--|
| Paper 1 | General Microbiology, Immunology, CVS& Blood, GI & Hepatobiliary, Musculoskeletal, skin &soft tissue infections, AETCOM module 2.4 |
| Paper 2 | CNS infections, Respiratory Tract Infections, Genitourinary Infections &STIs, Zoonotic &Miscellaneous, AETCOM module 2.5 |

1st and 2nd Internal Exams: (Time 3hrs)

Theory Paper Pattern and Marks Distribution:

| Paper | Section | Type and Number of Questions | Marks allotted | Total Marks |
|---------------------|-----------|---|---|-------------|
| 1 theory Paper only | Section A | MCQs (20) | 20 X1mk each= 20Mks | 20 |
| | Section B | SAQs (5/6) LAQs (1/2) (Atleast 1 LAQ clinical Based) | 5X 6 Mks each =30 Mks 1X 10 Mks each= 10 Mks | 40 |
| | Section C | SAQs (5/6) LAQs (1/2) (Atleast 1 LAQ clinical Based) | 5X 6 Mks each =30 Mks 1X 10 Mks each=10 Mks | 40 |
| TOTAL | | | | 100 |

Formative Examination

1stand 2ndInternal Exams: (Time 3hrs)

Practicals Pattern and Marks Distribution:

| | |
|-------------------|---------------|
| Grams Staining | 15Mks |
| ZN Staining | 15 Mks |
| Spots | 10 Mks |
| Clinical Case (1) | 20Mks |
| OSPE | 10Mks |
| Viva | 30Mks |
| Total | 100Mks |

OSPE

- **Time:** 5 minutes
- **No of stations:** 1 station
- **Level of assessment:** Psychomotor / cognitive / Soft skill
- **Marks:** 10 marks
- Individual check list to be prepared for each station.

Internal assessment calculation

| Sr. No. | Criteria | Theory | Practical |
|--------------|---|---------------|------------|
| 1. | *All internal assessment examinations including preliminary examination | 80 | 60 |
| 2. | Day to Day assessment | | |
| | ➤ Day to Day assessment (3 online MCQ tests and seminars) | 10+10 = 20Mks | |
| | ➤ Day to Day assessment (3 OSPE exercise etc) | | 20 |
| 3. | Journal and Logbook | | 20 |
| Total | | 100 | 100 |

***Internal assessment examinations marks conversion to internal**

assessment marks - Theory – Total 400 marks of Internal exams including Prelims will be converted to 80

Practical – Total 300 marks of Internal exams including Prelims will be converted to 60

Total Marks on Final Marksheet for the subject of Microbiology will be

| | |
|--------------|----------------|
| Theory | 200 Mks |
| Practical | 100 Mks |
| IA | 200 Mks |
| TOTAL | 500 Mks |

Resolution No.3.1.2.3 of BOM-59/2019: The updated list of Text books and Reference books for 2nd MBBS (Microbiology, Pharmacology, Pathology, FMT) are approved. [**Annexure-8**]

(To be merged with syllabus i.e. Annexure-69 of BOM-57/2019 dt.26/04/2019)

Recommended Books

A. Text Books :

| Sr. No. | Name of the Book | Author |
|----------------|----------------------------------|----------------------------|
| 1 | Textbook of Medical Microbiology | Prof C.P. Baveja |
| 2 | A Textbook of Microbiology | Apoorba Shastri |
| 3 | Textbook of Medical Microbiology | Rajesh Bhatia & Itchpujani |
| 4 | Textbook of Medical Parasitology | C K Jayaram Panikar |
| 5 | Medical Parasitology | C.P.Baveja V.Baveja |
| 6 | Textbook of Medical Parasitology | S C Parija |

B. Reference Books :

| Sr. No. | Name of the Book | Author |
|----------------|--|--|
| 1 | Textbook of Microbiology | R. Ananthanarayan C K Jayaram Panikar |
| 2 | A Textbook of Microbiology | P. Chakraborty |
| 3 | A textbook of Microbiology | Surinder Kumar |
| 4 | Textbook of Parasitology | Damle and Karyakarte |
| 5 | A Textbook of Parasitology | Dr.K.D. Chatterjee. |
| 6 | Practical Microbiology | Dr. Anuradha De |
| 7 | A textbook of Bioethics for Healthcare Professionals | Princy Palatty |
| 8 | Bioethics | Dr Chaudhary |
| 9 | MCQs in Microbiology | Dr Shilpa Nair |

MGM Medical College, Navi Mumbai
Department of Pathology

Annexure 1(c)

Name of the Board of Studies (Para-Clinical) to be held on 21st Sep 2022

(1) Item Number :- 1

New pattern: Day to Day assessment pattern for internal assessment calculations according to NMC for pathology, Microbiology and Pharmacology

| Sr. No. | Criteria | Theory | Practical |
|----------------|--|---------------|------------------|
| 1. | *All internal assessment examinations including preliminary examination | 80 | 60 |
| 2. | Day to Day assessment | | |
| | ➤ Day to Day assessment : Theory tests/ Seminars/ Quizzes) | 20 | - |
| | ➤ Day to Day assessment : Practical/ clinical tests, OSPE, and Directly observed Procedural Skills (DOPS) | - | 20 |
| 3. | Logbook + Journals (Journal + AETCOM logbook) | - | 20 |
| Total | | 100 | 100 |

***Internal assessment examinations marks conversion to internal assessment marks - Theory**
– Total 400 marks of internal exams including Prelims will be converted to 80

Practical – Total 300 marks of internal exams including Prelims will be converted to 60



MGM INSTITUTE OF HEALTH SCIENCES

(Deemed to be University u/s 3 of UGC Act, 1956)

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