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MGM INSTITUTE OF HEALTH SCIENCES

(Deemed to be University u/s 3 of UGC Act, 1956)
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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-41/2021, Dated 27/08/2021

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.

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

	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	1. Streptococcus, 2.Pneumococcus and Enterococcus	2hrs
MI2.2	Describe the classification etio-pathogenesis, clinical features and discuss the diagnostic modalities of Infective endocarditis	L		
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

	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, Klebseilla 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 that require certification : (NIL)			**Number of competencies: (3)**	**Number of procedures**
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

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 etio-pathogenesis 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 etio-pathogenesis, laboratory diagnosis and prevention of Infections of upper and lower respiratory tract	L	1. C.Diptheria 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 etio-pathogenesis 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 etio-pathogenesis and discuss the laboratory diagnosis of sexually transmitted infections. Recommend preventive measures	L	3. T pallidum	1 hr
MI7.3	Describe the etio-pathogenesis, clinical	L	4. UTI	1 hr

	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

	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 Immunulogy	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 Miscelleneous	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) Number of procedures that require certification : (01)					
MI 1.1	Describe the different causative agents of Infectious diseases+A208the 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 10. Serological reactions 2	4 hrs
MI1.8	Describe the mechanisms of immunity and response of the host immune system to infections				
	TOTAL	**5**	**5 Hrs**	**10**	**20hrs**

Topic: CVS and Blood certification : (NIL)		**Number of competencies: (7)**		**Number of procedures that require**	
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)**	

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. Enterobacteriacai e (E coli, Proteus, Klebseilla) 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 Number of competencies: (3) Number of procedures that require certification : (NIL)					
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

MI4.2	Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of bone & joint infections			2. Staphylococcus	2 hrs
MI4.3	Describe the etio-pathogenesis 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 etio-pathogenesis, 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 2. Bordatella and Hemophillus 3. M tuberculosis and ZN staining	6 hrs
MI6.3	Identify the common etiologic agents of lower respiratory tract infections (Gram Stain & Acid fast				

	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		

	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**
Infection Control: Part II Air borne precautions Contact Precautions Infection Control Committee	**MI 8.6:** Describe the basics of Infection control • 1Hr- Lecture (Interactive session) • 1 Hr- Integrated session (Debriefing and Feedback) **MI 8.8:** Describe the methods used and significance of assessing the microbial contamination of food, water and air • 1 Hr – Lecture (Case discussion)) **MI 6.3:** Identify the common etiologic agents of lower respiratory tract infections • 2hr DOAP Bordatella and Heamophillus (Visit to Isolation ward/ Video/ Photos of Isolation ward)
Pandemic Module 2.3	**Hours already allotted in Syllabus**
Sample Collection, Microbial diagnosis, Serologic testsand their performanceparameters	**MI 8.9:** Discuss the appropriate method of collection of samples in the performance of laboratory tests in the • 1 Hr lecture (Interactive session) • 1 SGT **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 • 2Hrs DOAP (Sample collection and Visit to lab)

	MI8.15 and MI 8.13: Choose and Interpret the results of the laboratory tests used in diagnosis of the infectious disease • 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 Immunulogy	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 Miscelleneous	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**: Demonstarte, 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

Sr. No.	Exam	Theory	Practical
1.	1st Internal assessment examination	100	100
2.	2nd 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.

Format of question

Paper Time – 3 hrs. **Preliminary & University**

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 & Miscelleneous, Aetcom module 2.5

Theory Paper Pattern and Marks Distribution: (3hrs)

Paper	**Section**	**Type and Number of Questions**	**Marks alloted**	**Total Marks**
Paper 1	Section A	MCQs (20) Gen Micro and Immuno-5	20 X1mk 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

	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 alloted**	**Total Marks**
Paper 2	Section A	MCQs (20) CNS-5 Resp Tract-5 Genitourinary and STIs-5 Zoonotic and Misc-5	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 alloted	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	40
			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**

Formative Examination

1StandInternal 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 Ultra short answer questions like Answer in one word or fill in the blanks tests of 20 Mks each)	20	
	➢ Day to Day assessment (SDL/ Seminar/ OSPE 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

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