

Second MBBS (from October 2020)

Subject: Microbiology Theory / Practical

Based on Medical Council of India, Competency based Undergraduate curriculum for the MBBS 2018. (Vol. 1; page nos. 205-227)

1. Total Teaching hours : **190**
2. A. Lectures(hours): **70**
- B. Self-directed learning (hours):- **10**
- C. Clinical Postings (Hours): **NA**
- D. Small group teachings/tutorials/Integrated teaching / Practical's (hours): **110**

Competency Nos.	Topics and Subtopics
MI1.1	Introduction to Microbiology and historical aspects. Introduction to bacteria, viruses & B. parasites, host parasite relationship, normal flora.
MI1.2	Morphology of bacteria, microscopy, Gram staining, Z-N staining, stool examination- routine
MI1.3	Types of infection, source/ reservoir of infection, modes of transmission, pathogenic incidence, types of infectious diseases (endemic, epidemic, pandemic, sporadic)
MI1.4	Methods of sterilization and disinfection, their application in the laboratory, clinical demonstration of working of autoclave
MI1.5	Choose the most appropriate method of sterilization and disinfection to be used in laboratory, in clinical and surgical practice
MI1.6	Mechanism of drug resistance, methods of antibiotic susceptibility testing, definition of MIC, interpretation of antibiotic susceptibility test report, antimicrobial audit/use, antibiotic stewardship.
MI1.7	Immunity
MI1.8	Antigen, antibodies, immune response and complement, antigen antibody reactions
MI1.9	Vaccines, universal vaccination program, immunoprophylaxis, immunotherapy

Competency Nos.	Topics and Subtopics
MI1.10	Hypersensitivity, autoimmune disorders and immunodeficiency states, laboratory methods
MI1.11	Immunological mechanisms of transplantation and tumor immunity
MI2.1	Rheumatic Heart Disease-definition, etiological agent, pathogenesis, clinical features and laboratory diagnosis
MI2.2	Infective endocarditis- classification, etiological agents, pathogenesis, clinical features and laboratory diagnosis
MI2.3	Blood collection for culture, throat swab collection, blood culture, ASO test, interpretation of results
MI2.4	Anemia-definition, etiological agents, pathogenesis, clinical features and laboratory diagnosis
MI2.5	Kala azar, malaria, filariasis and other common parasites prevalent in India - <i>Schistosoma</i> , <i>Paragonimus westermani</i> .
MI2.6	Peripheral smear staining for malaria, Identify the slide for filarial
MI2.7	HIV- epidemiology, the etio- pathogenesis, evolution, complications, opportunistic infections and the principles of management of HIV
MI3.1	Microbial agents causing diarrhea and dysentery- epidemiology, morphology, pathogenesis, laboratory diagnosis of Shigella, Campylobacter, Vibrio, salmonella, E. histolytica, Giardia
MI3.2	Stool examination-routine microscopy, hanging drop preparation, Intestinal nematodes, Norwalk virus and Rota virus, Coronavirus
MI3.3	Septicemia, Enteric fever and Food poisoning Salmonella -Morphology, pathogenesis, clinical diagnosis.
MI3.4	Blood culture, Widal test, Stool culture, Clot culture, Interpretation of the reports
MI3.5	Food poisoning- etiological agents, pathogenesis, clinical features and laboratory diagnosis
MI3.6	Staphylococci, Cl. botulinum, Bacillus cereus
MI3.7	Acid peptic disease (APD)- etio-pathogenesis, clinical course laboratory diagnosis and management
MI3.8	Viral hepatitis- etiological agents, pathogenesis, clinical features and laboratory diagnosis
	Cytomegalovirus, Epstein-Barr virus, HSV, VZV, Measles, Rubella
	Serological tests for the laboratory diagnosis of viral hepatitis, viral markers, interpretation of results

Competency Nos.	Topics and Subtopics
MI4.1	Anaerobic infections- etiological agents, pathogenesis, clinical features and laboratory diagnosis. Clostridia, non-spore bearing anaerobes, Clostridia
MI4.2	Bone and joint infections- etio-pathogenesis, clinical features and laboratory diagnosis. Pseudomonas, Staphylococci, Acinetobacter
MI4.3	Skin and soft tissue infections- etiological agents, pathogenesis, clinical features and laboratory diagnosis. Cutaneous and sub-cutaneous fungal infections, Mycetoma, Leprosy, Herpes.
MI5.1	Meningitis- etiological agents, pathogenesis, clinical features and laboratory diagnosis. Meningococcus, Haemophilus influenzae, Cryptococcus neoformans
MI5.2	Encephalitis- etiological agents, pathogenesis, clinical features and laboratory diagnosis. Herpes simplex encephalitis, viral encephalitis, Japanese encephalitis, Rabies, Aseptic meningitis -ECHO virus
MI5.3	laboratory diagnosis of meningitis, interpretation of laboratory reports
MI6.1	Upper respiratory tract infections- etiological agents, pathogenesis, clinical features and laboratory diagnosis. Orthomyxo virus, Paramyxo virus, Adenovirus, Rhinovirus, Diphtheria, Bordetella pertussis, Mycobacterium tuberculosis,
MI6.2	Gram staining- Interpretation of results
MI6.3	Z-N staining and Fluorescent staining- Interpretation of results
MI7.1	Genitourinary infections- etiological agents, pathogenesis, clinical features and laboratory diagnosis. Urethritis, Trichomoniasis, Bacterial vaginosis
MI7.2	Sexually transmitted infections- etiological agents, pathogenesis, clinical features and laboratory diagnosis. Gonorrhea, Herpes, Chlamydia, Calymmatobacterium, HPV, Molluscum contagiosum
MI7.3	Urinary tract infections- etiological agents, pathogenesis, significant bacteruria , clinical features and laboratory diagnosis. E. coli, Klebsiella, Proteus
MI8.1	Zoonotic diseases- etiological agents, mode of transmission, pathogenesis, clinical features and laboratory diagnosis. prevention-Brucella, Yersinia, Leptospira, Anthrax and Arbo viruses, Hydatid disease
MI8.2	Opportunistic infections- etio-pathogenesis, factors contributing to the occurrence of Opportunistic infections. Toxoplasma, Pneumocystis jiroveci, Cryptospora, Isospora,
MI8.3	Oncogenic viruses in the evolution of virus associated malignancy

Competency Nos.	Topics and Subtopics
MI8.5	Healthcare Associated Infections (HAI)- definition, types, factors that contribute to the development of HAI, methods for prevention- Pseudomonas, MOTT, Antibiotic associated diarrhea
MI8.6	Hand hygiene, bio medical waste management, environmental hygiene, use of equipment, cough etiquette, PEP, spill management, vaccination
MI8.7	Infection control practices and use of Personal Protective Equipments (PPE)
MI8.8	Microbiology of food, water and air
MI8.9	Methods of sample collection and transport
MI8.10	Collection and transport of specimens
MI8.11	Respect for patient samples sent to the laboratory for performance of laboratory tests
MI8.12	Confidentiality pertaining to patient identity in laboratory results
MI8.13	Appropriate laboratory test in the diagnosis of the infectious disease
MI8.14	Confidentiality pertaining to patient identity in laboratory results
MI8.15	Interpret the results of the laboratory tests used in diagnosis of the infectious disease
MI8.16	National Health Programs in the prevention of common infectious diseases- Vector borne diseases, Revised National Tuberculosis Control Program (RNTCP), National AIDS Control Program, Pulse Polio Program- Poliovirus
Miscellaneous topics - may be covered in theory or SGT	Burkholderia, Mycoplasma, Borrelia, Actinomycetes & Nocardia, Rickettsia, Bartonella, Ehrlichia, Chlamydiae, Ebola virus, Slow viruses

AETCOM Module no.	Topics and Subtopics
2.5	Bioethics-patient autonomy and decision making
2.6	Bioethics-patient autonomy and decision making
2.7	Bioethics-patient autonomy and decision making

Revision

Paper wise distribution of topics for Prelim & MUHS Annual Examination
Year: Second MBBS Subject: MICROBIOLOGY

Paper	Section	Topics
I	A	MCQs on all topics of the paper I
		General Microbiology and Immunity
		CVS and Blood
		Gastrointestinal and hepatobiliary system
		AETCOM Module No- 2.5,2.6 and 2.7
II	A	MCQs on all topics of the paper II
		Musculoskeletal system, skin and soft tissue infection
		Central nervous system infections
		Respiratory tract infections
		Genitourinary and sexually transmitted infections
		Zoonotic diseases and miscellaneous

**Second MBBS
Internal Assessment
Subject: Microbiology**

Applicable w.e.f October 2020 onwards examination for batches admitted onwards

Phase	I-Exam (After 3 months , Jan)			II-Exam (After 7 months, May)			Theory
	Theory	Practical (Including 10 Marks for Journal & Log Book)	Total Marks	Theory	Practical Including 10 Marks for Journal & Log Book	Total Marks	
Second MBBS	50	50	100	50	50	100	Paper 1 Paper 2

1. There will be 3 internal assessment examinations in Microbiology. The structure of the internal examinations should be similar to the structure of University examinations.
2. It is mandatory for the students to appear for all the internal assessment examinations.
3. First internal assessment examination will be held in January, second internal assessment examination will be held in May and third internal assessment examination will be held in July.
4. A student who has not taken minimum required number of tests for Internal Assessment practical will not be eligible for University examinations.
5. There will be only one additional examination for absent students (due to genuine reason) to be taken after preliminary examination and internal assessment marks to the University.
6. Internal assessment marks for theory will be out of 300 and practical will be out of 200.

7. Reduce total theory internal assessment to 40 marks and total practical internal assessment to 20 marks. Students must secure at least 50% marks of the total marks (combined in theory and practical) and 50% marks in theory and practical separately) to be eligible for appearing University examination.
8. **Conversion Formula for calculation of marks in internal assessment examinations**

	First IA	Second IA	Third IA (Prelim)	Total	Internal assessment marks: Conversion formula (out of 40)	Eligibility to appear for University examination (after conversion) (40% separately for Theory, 50% for Practical, 50% for Total)
Theory	50	50	200	300	$\frac{\text{Total marks obtained}}{7.5}$	16 (Minimum)
Practical	50	50	100	200	$\frac{\text{Total marks obtained}}{0.5}$	16 (Minimum)

While preparing Final Marks of Internal Assessment, the rounding-off marks shall be done as illustrated in the following table:

Internal Assessment Marks	Final rounded marks
15.01 to 15.49	15
15.50 to 15.99	16

9. Internal assessment marks will reflect as separate head of passing at the summative examination.
10. Internal assessment marks will not be added to marks of the University examination. They will be shown separately in mark list.

Second MBBS Practical Mark's Structure Internal Assessment Examinations

(Applicable w.e.f October 2020 onwards examination for batches admitted from Ju)

Subject : MICROBIOLOGY Practical								
Seat No.	I Term					II Term		
	Gram Stain	P.S. for M.P.	Journal/Log book	Viva	Total	Z-N stain	Stool - Routine microscopy	Jou
Max. Marks	10	10	10	20	50	10	10	



Second MBBS Practical Mark's Structure (Practical)

Applicable w.e.f October 2020 onwards examination for batches admitted from July 2020 onwards

Subject: MICROBIOLOGY								
Practical							Viva-I	
Seat No.	Gram/ Z-N staining	P.S. for M.P./ Stool –routine microscopy	Use of PPE/ Hand hygiene	Interpretation of reports	Journal/ Log book	Total	Viva-I	Oral
Max. Marks	15	15	10	20	10	70	15	





Second MBBS Practical Mark's Structure (M.U.H.S E

Applicable w.e.f October 2020 onwards examination for batches admitted from Ju

Subject: MICROBIOLOGY							
Practical							C
Seat No.	Gram/ Z-N staining	P.S. for M.P./ Stool –routine microscopy	Use of PPE/ Hand hygiene	Interpretation of reports	Journal/ Log book	Total	Viva-I
	A	B	C	D	E	F	G
Max. Marks	15	15	10	20	10	70	15



MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK FORMAT / SKELETON OF QUESTION PAPER

1. Course and Year : Second MBBS (applicable w.e.f. September 2021 & onwards examinations)	2. Subject Code :
3. Subject (PSP) : MICROBIOLOGY (TT) :	
4. Paper : I	5. Total Marks : 100
6. Total Time : 3 Hrs.	7. Remu. (Rs) : Rs. 300
	8. Remu. (Rs) : Rs. 350/-
9. Web Pattern : []	10. Web Skeleton : []
11. Web Syllabus : []	12. Web Old QP : []

Instructions:
SECTION "A" MCQ

- 1) Put ☐ in the appropriate box below the question number once only.
- 2) Use blue ball point pen only.
- 3) Each question carries **One mark**.
- 4) Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.

SECTION "B"
Instructions:

- 1) Use blue/black ball point pen only.
- 2) **Do not** write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.
- 3) **All** questions are **compulsory**.
- 4) The number to the right indicates full marks.
- 5) Draw diagrams **wherever** necessary.
- 6) Distribution of syllabus in Question Paper is only meant to cover entire syllabus within the stipulated frame. The Question paper pattern is a mere guideline. Questions can be asked from any paper's syllabus into any question paper. Students cannot claim that the Question is out of syllabus. As It is only for the placement sake, the distribution has been done.
- 7) Use a common answerbook for all sections.

SECTION "B" (40 Marks)

- | | | |
|-------------------------------------|-------------------------------------|-----------|
| 2. Short Answer Questions | (AETCOM 2.5, 2.6, 2.7) (compulsory) | (7x1=07) |
| a) | | |
| 3. Short Answer Questions | (Answer Any 3 out of 4) | (7x3=21) |
| a) b) c) d) | | |
| 4. Structured Long Answer Questions | (Compulsory) | (12x1=12) |
| a) | | |
| 5. Short Answer Questions | (Answer Any 4 out of 5) | (7x4=28) |
| a) b) c) d) e) | | |
| 6. Structured Long Answer Questions | (Compulsory) | (12x1=12) |
| a) | | |

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK FORMAT / SKELETON OF QUESTION PAPER

1. Course and Year	: Second MBBS (applicable w.e.f. September 2021 & onwards examinations)	2. Subject Code	:
3. Subject (PSP)	: MICROBIOLOGY		
(TT)	:		
4. Paper :	: II	5. Total Marks	: 100
		6. Total Time	: 3 Hrs.
		7. Remu. (Rs)	: Rs. 300/-
		8. Remu. (Rs)	: Rs. 350/-
9. Web Pattern	: []	10. Web Skeleton	: []
		11. Web Syllabus	: []
		12. Web Old QP	: []

Instructions:

SECTION "A" MCQ

- 1) Put ☐ in the appropriate box below the question number once only.
- 2) Use blue ball point pen only.
- 3) Each question carries **One mark**.
- 4) Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.

SECTION "A" MCQ (20 Marks)

1. Multiple Choice Questions (Total 20 MCQ of One mark each) (20 x 1 = 20)
 a) b) c) d) e) f) g) h) i) j)
 k) l) m) n) o) p) q) r) s) t)

SECTION "B"

Instructions:

- 1) Use blue/black ball point pen only.
- 2) **Do not** write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.
- 3) All questions are **compulsory**.
- 4) The number to the right indicates **full marks**.
- 5) Draw diagrams **wherever necessary**.
- 6) Distribution of syllabus in Question Paper is only meant to cover entire syllabus within the stipulated frame. The Question paper pattern is a mere guideline. Questions can be asked from any paper's syllabus into any question paper. Students cannot claim that the Question is out of syllabus. As it is only for the placement sake, the distribution has been done.
- 7) Use a common answerbook for all sections.

SECTION "B"

2. Short Answer Questions (7x4=28)
 a) b) c) d) e) (Answer Any 4 out of 5)
3. Structured Long Answer Questions (12x1=12)
 a) (Compulsory)
4. Short Answer Questions (7x4=28)
 a) b) c) d) e) (Answer Any 4 out of 5)
5. Structured Long Answer Questions (12x1=12)
 a) (Compulsory)

Competency Based Medical Education

Year: Second MBBS

Subject: Microbiology

Learning Resource Material

Books recommended:

1. Textbook of Microbiology – R. Ananthanarayan C. K. Jayaram Panikar
2. A Textbook of Microbiology – P. Chakraborty
3. Textbook of Medical Microbiology – Rajesh Bhatia & Itchpujani
4. Textbook of Medical Microbiology – Arora and Arora
5. Textbook of Medical Parasitology – C. K. Jayaram Panikar
6. Textbook of Medical Parasitology – Arora and Arora
7. Textbook of Medical Parasitology – S.C.Parija
8. Microbiology in clinical practice – D. C. Shanson
9. A Textbook of Parasitology – Dr. R.P. Karyakarte and Dr. A.S. Damle
10. Essentials of Medical Microbiology – Apurba shashtry

Reference books:

1. Mackie McCartney practical Medical Microbiology- Colle JG, Fraser AG
2. Principles of Bacteriology, Virology & Immunology vol. 1, 2, 3, 4, 5- Topley Wilsons
3. Medical Mycology (Emmons)- Kwon – Chung
4. Review of Medical Microbiology (Lange)- Jawetz
5. Immunology- Weir DM
6. Medical Microbiology- David Greenwood, Richard Stack, John Pentherer
7. Parasitology- KD Chatterjee
8. Medical virology- Timbury MC
9. Mackie McCartney Medical, Microbiology vol.1- Duguid JP
10. Microbial infections- Marmion BP, Swain RHA
11. Bailey & Scott's Diagnostic Microbiology
12. Textbook of Mycology – Jagdish Chander

Maharashtra University of Health Sciences Nashik



MUHS

MICROBIOLOGY LOGBOOK

For

PHASE II MBBS STUDENTS

AS PER

COMPETENCY BASED CURRICULUM

First Edition: 2020

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Preface

The Medical Council of India has revised the undergraduate medical education curriculum so that the Indian Medical Graduate (IMG) is able to recognize “**Health for all**” as a national goal. He/she should also be able to fulfil his/her societal obligations. The revised curriculum has specified the competencies that a student must attain and clearly defined teaching learning strategies for the same. With this goal in mind, early clinical exposure, integrated teaching, skill development, AETCOM and self-directed learning have been introduced. There would be emphasis on communication skills, basic clinical skills and professionalism. There is a paradigm shift from the traditional didactic classroom-based teaching to learning environments where there is emphasis on learning by exploring, questioning, applying, discussing, analysing, reflecting, collaborating and doing. The recognition of this need is enshrined by a greatly enhanced allocation of time to these methods and also the assessment techniques. With this view in mind the log book has been designed as per the guidelines of competency Based curriculum.

Name of the College

Admission Year : _____

CERTIFICATE

This is to certify that,

Mr/Ms. _____

Roll No. _____ has satisfactorily attended/completed all assignments mentioned in this logbook as per the guidelines prescribed by Medical Council of India, for Phase II MBBS Competency Based Curriculum in the subject of Microbiology.

Date: ____/____/____

Place: _____

Teacher-in-Charge

**Professor and Head
Department of Microbiology**

Instructions

- 1) This logbook is prepared as per the guidelines of MCI for implementation of Competency based curriculum for Phase II MBBS students in the subject of Microbiology.
- 2) Students are instructed to keep their logbook entries up to date.
- 3) Students are expected to write minimum 1 reflections on Self-Directed Learning (SDL).
- 4) Students also have to write reflections on AETCOM Modules – 2.5, 2.6 and 2.7.
- 5) Reflections should be structured using the following guiding questions:
 - What happened? (What did you learn from this experience)
 - So what? (What are the applications of this learning)
 - What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)
- 6) The logbook assessment will be based on multiple factors like
 - Attendance
 - Active participation in the sessions,
 - Timely completions
 - Quality of write up of reflections
 - Overall presentation

INDEX

Sr. No	Description	Page No's	Status	Signature of Teacher
			Complete/ Incomplete	
1	Self-Directed Learning, skill assessment, participation in Group discussions			
2	*AETCOM Module No. 2.5, 2.6, 2.7			
3	Attendance Records			
4	Records of Internal Assessment			

*AETCOM – Competencies for IMG, 2018, Medical Council of India.

Section 1. Self-Directed Learning, skill assessment, participation in Group discussions

[illegible]

[illegible]

Reflection on Self-directed learning Experience

Topic:

Date:

Signature of Teacher-in- charge

Reflection on Self-directed learning Experience

Topic:

Date:

firstranker.com
www.FirstRanker.com

Signature of Teacher-in- charge



Section 2

Reflection on AETCOM Module – 2.5

Topic:

Date:

firstRanker.com
www.FirstRanker.com

Signature of Teacher-in- charge



Reflection on AETCOM Module – 2.6

Topic:

Date:

Signature of Teacher-in- charge

Reflection on AETCOM Module - 2.7

Topic:

Date:

Signature of Teacher-in- charge

Section 3

Section 3A: Attendance Record of the Student

S. No	Term	Theory (%)	Practical (%)	Signature of student	Signature of Teacher
A	I Term				
B	II Term				
C	III Term				
D	Overall attendance				

Note: Above information is for the benefit of students and parents. In case of any discrepancy departmental record will be treated as final.

SECTION 3B: Details of attending extra classes [For poor attendance (if any)]

[illegible]

Note: Above information is for the benefit of students and parents. In case of any discrepancy departmental record will be treated as final.

Section 4
Records of Internal Assessment Examinations

Sr. No	Exam no	Theory	Practical including Viva	Signature of student	Signature of Teacher
1	I Internal Assessment	/50	/50		
2	II Internal Assessment	/50	/50		
3	III Internal Assessment	/200	/100		
4	Internal assessment (1+2+3)	/100	/100		
5	Betterment exam (If Any)	/200	/100		
6	Final Internal Assessment	/100	/100		

Note: Above information is for the benefit of students and parents. In case of any discrepancy departmental record will be treated as final.