

Course Content
Second MBBS (from October 2020)
Subject: PHARMACOLOGY Theory / Practical

Based on Medical Council of India, Competency based Undergraduate curriculum for the Indian Medical Graduate, 2018.
(Vol. 1; page nos. 136-159)

1. Total Teaching hours : **230**
2. A. Lectures(hours):**80** B. Self directed learning (hours) :- **12**
 C. Clinical Postings (Hours): NA
 D. Small group teachings/tutorials/Integrated teaching/Practicals (hours): **138**

Competency Nos.	Topics & Subtopics
PH1.1	Introduction to Pharmacology
PH1.2	
PH1.3	
PH1.9	
PH1.11	Routes of drug administration
PH1.4	Pharmacokinetics – Absorption, Distribution, Metabolism, Excretion
PH1.5	Pharmacodynamics
PH1.6	Adverse drug reactions –Types, mechanisms and precautions
PH1.7	
PH1.52	Principles of management of Poisoning
PH1.8	Drug interactions- Mechanisms and clinical relevance
PH1.59	Essential medicines, Fixed dose combinations Over the counter drugs Herbal medicines
PH1.60	Pharmacogenomics, Pharmacoeconomics
PH1.63	Drug Regulations
PH1.64	Drug development, Good Clinical Practice

Competency Nos.	Topics & Subtopics
PH1.10	Prescription writing
PH1.12	Factors modifying drug dose- Dose calculation
PH1.13	Pharmacology of Adrenergic drugs, Pharmacology of Anti adrenergic drugs
PH1.14	Pharmacology of Cholinergic drugs, Pharmacology of Anticholinergic drugs
PH1.15	Pharmacology of Skeletal muscle relaxants
PH1.16	Pharmacology of Histamine and antihistaminics, Pharmacology of Serotonin and drugs acting on serotonergic pathways, Pharmacotherapy of Migraine Pharmacology of NSAIDS Pharmacotherapy of Gout and Rheumatoid arthritis
PH1.17	Pharmacology of Local anaesthetics
PH1.18	Pharmacology of General anaesthetics and Preanesthetic drugs
PH1.19	Pharmacology of Sedatives & hypnotics Pharmacology of Antiepileptics Pharmacology of Anti depressants and anti anxiety drugs Pharmacology of Antipsychotics and anti manic drugs Pharmacology of Drugs used for neurodegenerative disorders Pharmacology of Opioids
PH1.20	Pharmacology of Alcohol and alcohol poisoning
PH1.21	
PH1.22	Pharmacology of drug dependence, drug abuse and Deaddiction
PH1.23	
PH1.24	Pharmacology of Diuretics and antidiuretics
PH1.25	Pharmacology of coagulants and anticoagulants Pharmacology of antiplatelets Pharmacology of thrombolytics and antifibrinolytics Pharmacology of plasma expanders
PH1.26	Pharmacology of Renin Angiotensin-Aldosterone system
PH1.27	Pharmacology of calcium channel blockers Pharmacology of other vasodilators and sympatholytics Pharmacotherapy of Hypertension, Pharmacotherapy of Shock

Competency Nos.	Topics & Subtopics
PH1.28	Pharmacology of Antianginal drugs Pharmacotherapy of IHD Pharmacology of Drugs for PVD
PH1.29	Pharmacology of Drugs used in CCF
PH1.30	Pharmacology of Antiarrhythmics
PH1.31	Pharmacology of Drugs for dyslipidemia
PH1.32	Pharmacology of Drugs for bronchial asthma and COPD
PH1.33	Pharmacology of Drugs for cough
PH1.34	Pharmacology of Drugs for acid peptic diseases Pharmacology of Antiemetics and prokinetics Pharmacology of Drugs for diarrhea and constipation
PH1.35	Pharmacotherapy of anemias
PH1.36	Pharmacology of Antidiabetic drugs Pharmacology of Drugs for thyroid dysfunction Pharmacology of Drugs affecting calcium metabolism
PH1.37	Pharmacology of Estrogen and antiestrogens Pharmacology of Progestins and antiprogestins Pharmacology of Androgens and antiandrogens Pharmacology of Anterior Pituitary hormones and their antagonists
PH1.38	Pharmacology of Corticosteroids and antagonists
PH1.39	Pharmacology of Hormonal contraceptives
PH1.40	Pharmacotherapy of infertility and erectile dysfunction
PH1.41	Pharmacology of Oxytocics and tocolytics
PH1.42	Introduction to Chemotherapy-General principles, Pharmacology of Sulfonamides and Trimethoprim Pharmacology of Fluoroquinolones, Pharmacology of Penicillin and its derivatives Pharmacology of Cephalosporins, Pharmacology of other Beta lactam antibiotics
PH1.43	Pharmacology of Aminoglycosides, Pharmacology of Macrolides Pharmacology of Broad spectrum antibiotics, Pharmacology of newer antibacterials

Competency Nos.	Topics & Subtopics
PH1.44	Pharmacology of Antitubercular drugs including MDR and XDR TB
PH1.45	
PH1.46	Pharmacology of Antileprotics
PH1.47	Pharmacology of Antimalarials Pharmacology of Antiamoebic and other Antiprotozoal drugs Pharmacology of Anthelmintics
PH1.48	Pharmacotherapy of UTI Pharmacotherapy of STD Pharmacology of Antiretroviral drugs
PH1.49	Pharmacology of Anticancer drugs
PH1.50	Pharmacology of Immunomodulators
PH1.51	Occupational and environmental toxicology
PH1.53	Pharmacology of Chelating agents
PH1.54	Vaccines and Antisera
PH1.55	National health programs
PH1.56	Geriatric and Pediatric pharmacology
PH1.57	Drugs used in skin disorders
PH1.58	Drugs used in Ocular disorders
PH1.61	Dietary supplements and Nutraceuticals
PH1.62	Antiseptics and Disinfectants
Competency Nos.	Topics & Subtopics
	CLINICAL PHARMACY
PH2.1	Drug dosage forms (Oral, local, parenteral)
PH2.2	ORS preparation
PH2.3	Intravenous drip setting
PH2.4	Dosage calculation
	CLINICAL PHARMACOLOGY

Competency Nos.	Topics & Subtopics
	CLINICAL PHARMACY
PH3.1	Prescription writing and communication
PH3.8	
PH5.1	
PH3.2	Critical appraisal of Prescription
PH3.3	Evaluation of Promotional Drug literature
PH3.4	Adverse drug reaction-Identification and reporting
PH3.5	Introduction to the concept of P – drugs and preparation of P-drug list
PH3.6	Interaction with a pharmaceutical representative and critical evaluation of Drug information
PH3.7	Introduction to the concept of Essential medicines
	EXPERIMENTAL PHARMACOLOGY
PH4.1	Drug administration on Maniquins
PH4.2	Study of effects of drugs on blood pressure using software
	COMMUNICATION TOPICS
PH5.2	Importance of optimal use of drug therapy, storage of medicines
PH5.3	Importance of Drug Compliance
PH5.4	
PH5.5	Problems associated with prescribing drugs with dependence liability
PH5.6	Problems associated with use of OTC drugs
PH5.7	Prescription: legal and ethical aspects
2.1	AETCOM-1
2.2	AETCOM-2
2.3	AETCOM-3

Paper wise distribution of topics for Prelim & MUHS Annual Examination

Year: Second MBBS Subject: **Pharmacology**

Paper	Section	Topics
I	A	MCQs on all topics of the paper I
	B	General Pharmacology
		Autonomic Nervous system including skeletal muscle relaxants
		Cardiovascular system
		Haematology
		Gastro intestinal drugs
		Respiratory system
		AETCOM- 2.1, 2.2, 2.3 (section B one SAQ)
II	A	MCQs on all topics of the paper II
	B	Central Nervous system including general/local anaesthesia
		Endocrine system
		Chemotherapy system
		Autacoids
		MISC. TOPICS : Chelating agents, Vaccines and Antisera, ocular pharmacology, dermatological pharmacology, nutraceuticals, occupational and environmental pharmacology, toxicology)

**Second MBBS
Internal Assessment
Subject: Pharmacology**

Applicable w.e.f October 2020 onwards examination for batches admitted from June 2019 onwards

Phase	I-Exam (Jan)			II-Exam (May)			Prelim (July)		
	Theory	Practical (Including 10 Marks for Journal & Log Book)	Total Marks	Theory	Practical Including 10 Marks for Journal & Log Book	Total Marks	Theory	Practical	Total Marks
Second MBBS	100	100	200	100	100	200	Paper 1 -100 Paper 2 -100	100	300

1. There will be 3 internal assessment examinations in Pharmacology. The structure of the internal assessment theory 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 each in theory and practical will not be eligible for University examinations.
5. There will be only one additional examination for absent students (due to genuine reason) after approval by the Institutional Grievances Committee. It should be taken after preliminary examination and before submission of internal assessment marks to the University.

6. Internal assessment marks for theory will be out of 400 and practical will be out of 300.
7. Reduce total theory internal assessment to 40 marks and total practical internal assessment to 40 marks. Students must secure at least 50% marks of the total marks (combined in theory and practical; not less than 40 % 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 final University examination (after conversion out of 40) (40% separately in Theory & Practical, 50% Combined)	
Theory	100	100	200	400	<u>Total marks obtained</u> 10	16 (Minimum)	Total of Theory + Practical Must be 40.
Practical	100	100	100	300	<u>Total marks obtained</u> 7.5	16 (Minimum)	

While preparing Final Marks of Internal Assessment, the rounding-off marks shall done as illustrated in 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 to be added to marks of the University examinations and will be shown separately in mark list.

Practical marks Distribution:

A. For Ist and IInd term examinations

1. **Journal / Logbook** - 10 Marks
2. **Viva – 20 marks**
3. **Clinical Pharmacy (20 marks) –**
 - a. Dosage form- 10 marks,
 - b. ORS preparation/ IV drip setting- 5 marks
 - c. Dose calculation – 5 marks
4. **Clinical Pharmacology (30 marks)-**
 - a. Prescription writing- 10 marks
 - b. Prescription criticism and rewriting / justification of FDC – 10 marks
 - c. ADR identification / ADR reporting- 5 marks
 - d. P- drug list- 5 marks.
5. **Experimental Pharmacology (10 marks) OSPE –**
 - a. Drug administration using maniquin / drug effect using CAL software (or any other)- 10 marks
6. **Communication (10 marks) OSPE-**
 - a. prescription communication / ethics- legal drug storage/ use of device/drug adherence-compliance/ drug dependence/OTC/ interaction with Medical representative- 10 marks

B. For Preliminary examinations

1. **Viva – 30 marks**
 - a. Viva I- 15 marks
 - b. Viva II- 15 marks
2. **Clinical Pharmacy (20 marks) –**
 - a. Dosage form- 10 marks,
 - b. ORS preparation/ IV drip setting- 5 marks
 - c. Dose calculation – 5 marks
3. **Clinical Pharmacology (30 marks)-**
 - a. Prescription writing- 10 marks
 - b. Prescription criticism and rewriting / justification of FDC – 10 marks
 - c. ADR identification / ADR reporting- 5 marks
 - d. P- drug list- 5 marks.
4. **Experimental Pharmacology (10 marks) OSPE –**
 - a. Drug administration using maniquin / drug effect using CAL software (or any other)- 10 marks
5. **Communication (10 marks) OSPE-**
 - a. prescription communication / ethics- legal drug storage/ use of device/drug adherence-compliance/ drug dependence/OTC/ interaction with Medical representative- 10 marks

Second MBBS Practical Mark's Structure (I, II & Prelim Exam.)

Applicable w.e.f October 2020 onwards examination for batches admitted from June 2019 onwards

Subject: PHARMACOLOGY								
Practical						VIVA	Log Book/ Journal	Practical & Oral
Seat No.	Clinical Pharmacy	Clinical Pharmacology	Experimental Pharmacology	Communication	Total			
Max. Marks	20	30	10	10	70	20	10	100

Second MBBS Practical Mark's Structure (M.U.H.S. Final Exam.)

Applicable w.e.f October 2020 onwards examination for batches admitted from June 2019 onwards

Subject: PHARMACOLOGY									
Practical						Oral/Viva			Total
Seat No.	Clinical Pharmacy	Clinical Pharmacology	Experimental Pharmacology	Communication	Total	VIVA 1	VIVA 2	Total	Practical & Oral (E + H)
	A	B	C	D	E	F	G	H	I
Max. Marks	20	30	10	10	70	15	15	30	100

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

FORMAT / SKELETON OF QUESTION PAPER

1. Course and Year : Second MBBS <i>(applicable w.e.f. September 2021 & onwards examinations)</i>	2. Subject Code :
3. Subject (PSP) : Pharmacology (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 "A" MCQ (20 Marks)

1. Multiple Choice Questions (Total 20 MCQ of One mark each) (20 x1 = 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 (AETCOM(2.1, 2.2, 2.3)(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 <i>(applicable w.e.f. September 2021& onwards examinations)</i>	2. Subject Code :
3. Subject (PSP) : Pharmacology (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) 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 x1 = 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(Answer Any 4 out of5) (7x4=28)
 - a) b) c) d) e)
3. Structured Long Answer Questions (**Compulsory**) (12x1=12)
 - a)
4. Short Answer Questions (Answer Any 4 out of 5) (7x4=28)
 - a) b) c) d) e)
5. Structured Long Answer Questions (**Compulsory**) (12x1=12)
 - a)

Competency Based Medical Education

Year: Second MBBS

Subject: *Pharmacology Learning Resource Material*

Books recommended :

1. Basic & Clinical Pharmacology. Katzung BG (Ed), Publisher: Prentice Hall International Ltd., London.
2. Pharmacology & Pharmacotherapeutics. Satoskar RS, Bhandarkar SD (Ed), Publisher: Popular Prakashan, Bombay.
3. Essentials of Medical Pharmacology. Tripathi KD (Ed), Jaypee Brothers, publisher: Medical Publishers (P) Ltd.
4. Clinical Pharmacology. Laurence DR, Bennet PN, Brown MJ (Ed). Publisher: Churchill Livingstone

Reference books :

1. Goodman & Gilman's The Pharmacological Basis of Therapeutics. Hardman JG & Limbird LE (Ed), Publisher: McGraw-Hill, New York.
2. A Textbook of Clinical Pharmacology. Roger HJ, Spector RG, Trounce JR (Ed), Publisher: Hodder and Stoughton Publishers.

Maharashtra University of Health Sciences
Nashik



**PHARMACOLOGY LOGBOOK For PHASE SECOND
MBBS STUDENTS AS PER COMPETENCY BASED
CURRICULUM**

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, 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 I MBBS Competency Based Curriculum in the subject of Pharmacology.

Date: ___/___/_____

Place: _____

Teacher Incharge

**Professor and Head
Department of Pharmacology**

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 Pharmacology.

2) Students are instructed to keep their logbook entries up to date.

3) Students are expected to write minimum 2 reflections on any two activities each of Clinical Pharmacology skills & Self-Directed Learning (SDL).

4) Students also have to write reflections on AETCOM Module 2.1 , 2.2, 2.3) 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?)

5) 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 Complete/ Incomplete	Signature of Teacher
1	Clinical Pharmacology Skills			
2	Self-Directed Learning, Seminars, Projects, Quizzes			
3	AETCOM Module * 2.1 , 2.2, 2.3			
4	Attendance Records			
5	Records of Internal Assessment			

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

Record of Clinical Pharmacology Skills

S.No	Skill	Setting	Correlation	Date	Signature of Teacher
1	Critical appraisal of prescription / audit				
2	Critical evaluation of promotional literature				
3	Filling and interpretation of ADR report				
4	Prepare and explain P drug list				
5	Optimised Interaction with pharmaceutical representative				
6	Prepare essential drug list for health care facility				

Reflection on Clinical Pharmacology Skills

Topic:

Date:

Signature of Teacher-in- charge

Reflection on Clinical Pharmacology Skills

Topic:

Date:

Signature of Teacher-in- charge

Reflection on Clinical Pharmacology Skills

Topic:

Date:

Signature of Teacher-in- charge

2. Self Directed Learning, Seminars, Tutorials, Projects, Quizzes

S.No	Self Directed Learning, Seminars, Tutorials, Projects, Quizzes	Date	Signature of Teacher

Reflection on self directed learning activities

Topic:

Date:

Signature of Teacher-in- charge

Reflection on self directed learning activities

Topic:

Date:

Signature of Teacher-in- charge

Reflection on self directed learning activities

Topic:

Date:

Signature of Teacher-in- charge

3: AETCOM Module

2.1 Foundation of communication 2

2.2 Foundation of bioethics

2.3 Health care as a right

Reflection on AETCOM module

Topic:

Date:

Signature of Teacher-in- charge

Reflection on AETCOM module

Topic:

Date:

Signature of Teacher-in- charge

Reflection on AETCOM module

Topic:

Date:

Signature of Teacher-in- charge

4A: Attendance Record of the Student

S. No	Term	Theory (%)	Practical (%)	Signature of the Student	Signature of the Teacher
A	I Term				
B	II Term				
C	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 4B: Details of attending extra classes [For poor attendance (if any)]

S.No	Date	Period	Total hrs	Signature of student	Signature of Teacher
Total hours					

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

Section 5. Records of Internal Assessment Examinations

Records of Internal Assessment examinations

S.No	Exam	Theory	Practical including viva	Signature of student	Signature of Teacher
1	I Internal Assessment	/ 100	/ 100		
2	II Internal Assessment	/ 100	/ 100		
3	III Internal Assessment (Prelim)	/ 200	/ 100		
4	Internal Assessment marks	/ 400	/ 300		
5	Betterment exam	/ 200	/ 100		
6	Final Internal Assessment	/ 400	/ 300		

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