3. Amendment to Ordinance V (2) & VII. [EC. Res. 78-7 dated 25.03.2022] regarding course curriculum prepared on competency based UG curriculum for MBBS course -2nd Professional (New Scheme).

Revised Pharmacology Curriculum (CBME) 2020 Onwards

CURRICULUM OF PHARMACOLOGY FOR MEDICAL STUDENTS

Preamble

Pharmacology is the science of medicines. The knowledge of the molecular basis of drug action, its therapeutic applications, the adverse effects caused by the medications, their prevention and treatment and the effects of administering two or more drugs to a patient will be learnt in the context of its clinical application and not just as facts. The use of medicines for treating patients with the required medications, at the right dose, in the right way, for the right duration and at a appropriate cost, with consideration for all

social, environmental and economic factors that may impact the therapy. The emphasis will be on clinical relevance of pharmacology knowledge.

1. **VISION / GOAL**

The broad goal of teaching pharmacology to under graduate students is to inculcate rational and scientific basis of therapeutics. To provide knowledge of pharmacology based on evidence and to foster the development of a highly knowledgeable, skilled and competent Indian Medical Graduates imbued with the concept of rational Pharmaco-therapeutics. Simultaneously focus is to impart requisite skills, attitudes, values and responsiveness, so that the students are able to function appropriately and effectively as doctors at the community level while being globally relevant.

2. LEARNING OBJECTIVES (overall)

i. To equip the Indian Medical Graduate (IMG) with the knowledge of scientific basis of therapeutics and the skills of rational prescribing.
ii. The student should acquire knowledge of the principles and application of Pharmacotherapy.
iii. The student should be able to demonstrate appropriate use of medicines in disease with consideration to its efficacy, safety, suitability and cost for the individual and mass therapy.
iv. The student should have an understanding of general considerations of antimicrobial resistance and antibiotic stewardship program

Access knowledge about medicines through reliable resources to enable the students to fulfill their roles of an Indian Medical Graduate as a clinician, leader, communicator, lifelong learner and professional

3. COMPETENCIES

The student during the training program should acquire the following competencies:

(a) Knowledge /Cognitive Domain

At the end of the course the learner shall be able to:

1. Understand the general principles of drug action and handling of drugs by the body in all the individuals including children, elderly, lactating and pregnant women and those having a renal and/or hepatic disease and genetic variations.

2. Prescribe drugs rationally by:
   a. Understanding the importance of both the non pharmacological (non-drug) and pharmacological (drug) treatment
   b. Selection of drugs based on suitability, tolerability, efficacy and cost.

3. Apply pharmacokinetic principles in clinical practice pertaining to the drugs used in commonly encountered conditions, National Health Programmes and emergency medical conditions.

4. Foresee, prevent and manage adverse drug events and drug/food/traditional medicine interactions.

5. Use antimicrobials judiciously for therapy and prophylaxis, understanding the rapid development of Antimicrobial resistance (AMR).

6. Understand and implement the concepts of essential medicines, pharmacoeconomics and evidence-based medicine for improving the community health care.

7. Describe the clinical presentation and management of common poisoning including bites and stings.

8. Understand the basic concepts of new drug development with emphasis on design and conduct of clinical trials and interpretation of their results.

(b) Skills/ Psychomotor Domain

At the end of the course the learner shall be able to perform and interpret following Skills

1. Write a correct, complete and legible prescription for common ailments including those in the National health Programmes and emergency medical conditions. And should be able to modify the prescription in case of drug interactions.

2. Calculate the drug dosage using appropriate formulae for an individual patient.

3. Administer the required dose of different drug formulations using appropriate devices and techniques (e.g injections, inhalers, transdermal patches etc.).

4. Advice and interpret the therapeutic monitoring reports of important drugs.

5. Identify, analyze and report adverse drug reactions to appropriate authorities.

6. Retrieve drug information from appropriate sources including the electronic resources.

7. Analyse critically drug promotional literature in terms of pharmacological actions of the ingredients, rational/irrational nature of the preparation, economics of the use and claims by the pharmaceutical companies.

(c) Communication affective attitude Domain

1. Effectively explain to patients, the effects and side effects of drugs, including the need for medication adherence.
2. Communicate effectively with pharmacological reasoning with health care team on rational use of drugs and improving spontaneous reporting of adverse events.
3. Motivate patients with chronic diseases to adhere to the line of management as outlined by the health care provider.
4. Demonstrate respect in interactions with peers, and other healthcare professionals.
5. Demonstrate ethical behavior and integrity in one's work.
6. Demonstrate ability to generate awareness about the use of generic drugs in patients.
7. Understand the legal and ethical aspects of prescribing drugs.
8. Acquire skills for self-directed learning to keep up with developments in the field and to continuously build to improve on skills, expertise and perpetual professional development.

4. COURSE

Course content for detailed competencies given below in Appendix 1

PH	Competency
1.1	Define and describe the principles of pharmacology and pharmacotherapeutics
1.2	Describe the basis of Evidence based medicine and Therapeutic drug monitoring
1.3	Enumerate and identify drug formulations and drug delivery systems
1.4	Describe absorption, distribution, metabolism & excretion of drug
1.5	Describe general principles of mechanism of drug action
1.6	Describe principles of Pharmacovigilance & ADR reporting systems
1.7	Define, identify and describe the management of adverse drug reactions (ADR)
1.8	Identify and describe the management of drug interactions
1.9	Describe nomenclature of drugs i.e. generic, branded drug
1.10	Describe parts of a correct, complete and legible generic prescription. Identify errors in prescription and correct appropriately
1.11	Describe various routes of drug administration, eg. oral, SC, IV, IM, SL
1.12	Calculate the dosage of drugs using appropriate formulae for an individual patient, including children, elderly and patient with renal

	dysfunction
1.13	Describe mechanism of action, types, doses, side effects, indications and contraindications of adrenergic and anti-adrenergic drugs
1.14	Describe mechanism of action, types, doses, side effects, indications and contraindications of cholinergic and anticholinergic drugs
1.15	Describe mechanism/s of action, types, doses, side effects, indications and contraindications of skeletal muscle relaxants
1.16	Describe mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs which act by modulating autacoids, including: anti-histaminic, 5-HT modulating drugs, NSAIDs, drugs for gout, anti-rheumatic drugs, drugs for migraine
1.17	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of local anesthetics
1.18	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of general anesthetics, and preanesthetic medications
1.19	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs which act on CNS, (including anxiolytics, sedatives & hypnotics, anti-psychotic, antidepressant drugs, anti-maniacs, opioid agonists and antagonists, drugs used for neurodegenerative disorders, anti-epileptics drugs)
1.20	Describe the effects of acute and chronic ethanol intake
1.21	Describe the symptoms and management of methanol and ethanol poisonings
1.22	Describe drugs of abuse (dependence, addiction, stimulants, depressants, psychedelics, drugs used for criminal offences)
1.23	Describe the process and mechanism of drug deaddiction
1.24	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs affecting renal systems including diuretics, antidiuretics- vasopressin and analogues
1.25	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs acting on blood, like anticoagulants, antiplatelets, fibrinolytics, plasma expanders
1.26	Describe mechanisms of action, types, doses, side effects, indications and contraindications of the drugs modulating the renin-angiotensin and aldosterone system
1.27	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of antihypertensive drugs and drugs used in shock
1.28	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in ischemic heart disease (stable, unstable angina and myocardial infarction), peripheral vascular disease

1.29	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in congestive heart failure
1.30	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the antiarrhythmics
1.31	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in the management of dyslipidemias
1.32	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of drugs used in bronchial asthma and COPD
1.33	Describe the mechanism of action, types, doses, side effects, indications and contraindications of the drugs used in cough (antitussives, expectorants/ mucolytics)
1.34	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs used as below: 1. Acid-peptic disease and GERD 2. Antiemetics and prokinetics 3. Antidiarrhoeals 4. Laxatives 5. Inflammatory Bowel Disease 6. Irritable Bowel Disorders, biliary and pancreatic diseases
1.35	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of drugs used in hematological disorders like: 1.Drugs used in anemias 2.Colony Stimulating factors
1.36	Describe the mechanism of action, types, doses, side effects, indications and contraindications of drugs used in endocrine disorders (diabetes mellitus, thyroid disorders and osteoporosis)
1.37	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used as sex hormones, their analogues and anterior Pituitary hormones
1.38	Describe the mechanism of action, types, doses, side effects, indications and contraindications of corticosteroids
1.39	Describe mechanism of action, types, doses, side effects, indications and contraindications the drugs used for contraception
1.40	Describe mechanism of action, types, doses, side effects, indications and contraindications of 1. Drugs used in the treatment of infertility, and 2. Drugs used in erectile dysfunction
1.41	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of uterine relaxants and stimulants

1.42	Describe general principles of chemotherapy
1.43	Describe and discuss the causes, extent and burden of Antimicrobial Resistance (AMR). Rational use of antimicrobials including antibiotic stewardship program
1.44	Describe the first line antitubercular dugs, their mechanisms of action, side effects and doses.
1.45	Describe the drugs used in MDR and XDR Tuberculosis
1.46	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of antileprotic drugs
1.47	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in malaria, KALA-AZAR, amebiasis and intestinal helminthiasis
1.48	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in UTI/ STD and viral diseases including HIV
1.49	Describe mechanism of action, classes, side effects, indications and contraindications of anticancer drugs
1.50	Describe mechanisms of action, types, doses, side effects, indications and contraindications of immunomodulators and management of organ transplant rejection
1.51	Describe occupational and environmental pesticides, food adulterants, pollutants and insect repellents
1.52	Describe management of common poisoning, insecticides, common sting and bites
1.53	Describe heavy metal poisoning and chelating agents
1.54	Describe vaccines and their uses
1.55	Describe and discuss the following National Health Programmes including Immunisation, Tuberculosis, Leprosy, Malaria, HIV, Filaria, Kala Azar, Diarrhoeal diseases, Anaemia & nutritional disorders, Blindness, Non-communicable diseases, cancer and Iodine deficiency
1.56	Describe basic aspects of Geriatric and Pediatric pharmacology
1.57	Describe drugs used in skin disorders
1.58	Describe drugs used in Ocular disorders
1.59	Describe and discuss the following: Essential medicines, Fixed dose combinations, Over the counter drugs, Herbal medicines
1.60	Describe and discuss Pharmacogenomics and Pharmacoeconomics
1.61	Describe and discuss dietary supplements and nutraceuticals
1.62	Describe and discuss antiseptics and disinfectant
1.63	Describe Drug Regulations, acts and other legal aspect
1.64	Describe overview of drug development, Phases of clinical trials and Good Clinical Practice
	CLINICAL PHARMACY

2.1	Demonstrate understanding of the use of various dosage forms (oral/local/parenteral; solid/liquid)
2.2	Prepare oral rehydration solution from ORS packet and explain its use
2.3	Demonstrate the appropriate setting up of an intravenous drip in a simulated environment
2.4	Demonstrate the correct method of calculation of drug dosage in patients including those used in special situations
	CLINICAL PHARMACOLOGY
3.1	Write a rational, correct and legible generic prescription for a given condition and communicate the same to the patient
3.2	Perform and interpret a critical appraisal (audit) of a given prescription
3.3	Perform a critical evaluation of the drug promotional literature
3.4	To recognise and report an adverse drug reaction
3.5	To prepare and explain a list of P-drugs for a given case/condition
3.6	Demonstrate how to optimize interaction with pharmaceutical representative to get authentic information on drug
3.7	Prepare a list of essential medicines for a healthcare facility
3.8	Communicate effectively with a patient on the proper use of prescribed medication
	EXPERIMENTAL PHARMACOLOGY
4.1	Administer drugs through various routes in a simulated environment using mannequins
4.2	Demonstrate the effects of drugs on blood pressure (vasopressor and vaso-depressors with appropriate blockers) using computer aided learning
	COMMUNICATION
5.1	Communicate with the patient with empathy and ethics on all aspects of drug use
5.2	Communicate with the patient regarding optimal use of a) drug therapy, b) devices and c) storage of medicines
5.3	Motivate patients with chronic diseases to adhere to the prescribed management by the health care provider
5.4	Explain to the patient the relationship between cost of treatment and patient compliance
5.5	Demonstrate an understanding of the caution in prescribing drugs likely to produce dependence and recommend the line of management
5.6	Demonstrate ability to educate public & patients about various aspects of drug use including antimicrobials as prescription drugs, drug dependence and OTC drugs
5.7	Demonstrate an understanding of the legal and ethical aspects of prescribing drugs

RECOMMENDED HOURS of Pharmacology Teaching

Total	**- 230 hours**
Lectures	**- 80 hours**
Practicals	**- 138 hours**
Self Directed Learning	**- 12 hours**

5. TEACHING LEARNING METHODS

Teaching Learning methods used would include both for large group teaching and small group teaching. Approximately one third of time will be for didactic lectures.

Large group -Any instructional large group method including traditional lecture and interactive lecture.

Small Group – Any instructional method involving small groups of students in an appropriate learning context. These topics included are those where more intensive and interactive learning sessions are required.

Will be as follows

-Demonstration-Observation-Assistance-Performance (DOAP) - Sessions: A practical session that allows the student to observe a demonstration, assist the performer, perform in a simulated environment, perform under supervision or perform independently.
Demonstration of different routes of drug administration i.e. Intravenous, Intramuscular, subcutaneous, Inhalation, Drug formulation exercises (Clinical Pharmacy).

- Problem based learning for Small Group Discussions - Drug nomenclature, Home remedies and house hold measures, Fixed dose drug combinations, Prescription writing, Rational Use of Medicines, Drug Advertisement, Drug dose calculation, Drug interaction, Drug food interactions and interaction of drugs of modern & traditional medicines, Antimicrobial Stewardship Program & Rational Use of antimicrobials, Essential Medicine concept, P Medicine exercises for treatment of common disease conditions, Monitoring drug therapy, Ethics in Human Volunteer Experiment, Adverse Drug Reaction (ADR) form filling exercise.

-Computer Assisted Learning - Experiments showing effects of drugs on physiological systems. For example Effect of drugs on Rabbit Eye, Effect of drugs on Dog Blood Pressure, Effect of drugs on Frog Rectus abdominis muscle.

-Student Presentations - Evolution of Medicine and Pharmacology, Sources of Medicines, Drug formulations, Pharmacological basis of House hold remedies, Indian Systems of Medicines , Systemic Pharmacology etc.

-Preparation of Charts and Models - Evolution of Medicine and Pharmacology, House hold remedies, Drug dosage forms.

-Clinical Exposure - Clinical case discussions on common disease conditions, ADR monitoring and reporting.

-Self Directed Learning - A process in which individuals take the initiative, with or without the help of others in diagnosing their learning needs, formulating learning goals, identifying human and material sources for learning, choosing and implementing appropriate learning methods.

Preparation for seminars, projects, student presentations on areas of interest and relevant to learning of Pharmacology.

6. ASSESSMENT

a) Formative Assessment: Formative assessment shall be done periodically throughout the course.

b) Internal Assessment:

i) No less than three internal assessment exams shall be conducted during the course.

ii) Certifiable competencies: Achievement of certifiable competencies would also be recorded in logbooks. The student must have completed the required certifiable competencies and completed the log book to be eligible for appearing at the final university examination. (Appendix 2: List of Certifiable competencies)

iii) Log Book: Log book is to be maintained to record all activities like Drug formulations, Computer Assisted Learning exercises, Experimental Pharmacology, Clinical Pharmacology and other academic activities. It has to be submitted to the department regularly and would be assessed regularly (Appendix 3).

Internal assessment will be calculated for Theory (40) marks & Practical (20) marks.

50% combined in theory and practical (not less than 40% in each) for eligibility for appearing for University Examinations.

c) Summative theory practical and Viva voice pattern with distribution of marks :

At the end of the course a final examination will be conducted by the University.

University (Professional) examination: There will be a Theory and Practical + Viva examination .

i) THEORY PAPERS
There shall be two theory papers.
Each paper shall be of 03 hours duration and of 100 marks.

THEORY PAPER - PHARMACOLOGY
Theory (200 marks) (Paper I – 100, Paper II – 100)

PAPER – I (100 Marks)
Topics: General Pharmacology, Drugs acting on Autonomic nervous system, Drugs acting on Central nervous system, Drugs acting on Peripheral nervous system, Drugs acting on Cardio vascular system, Drugs acting on Kidney, Drugs acting on Respiratory system.

PAPER – II (100 Marks)
Topics: Chemotherapy of infective, parasitic disorders and malignancy, Drugs acting on Reproductive system, Drugs related to Endocrinal system, Drugs acting on Gastrointestinal system, skin and mucous membrane, Autacoids, Drugs affecting Blood and blood formation, Vitamins, Antiseptics and disinfectant, Diagnostic agents, Chelating agents, Vaccines and sera, Environmental pollutants.

THEORY QUESTION PAPER FORMAT
Each paper will have three Parts. Part 1 of 20 marks, & Part II of 40 marks each.
Each part will have two questions

Each paper 100 marks

Part I **20 marks**
Objective type questions

Q1. Multiple type questions of inferential, reasoning type (5 x 2 marks=10)
Q2. State True or False / Fill in the blanks, Match the following (5 x 2 marks =10)
Mechanism of action/Therapeutic uses/ adverse effects of drugs,
Drug of choice type of questions

Part II **40 marks**
Q 3. Explain why (rationale of) giving suitable examples (5 x 4 marks= 20 marks)
Q 4. a)Long structured question based on a Case scenario (10 marks)
b)Short notes (2 x 5 =10 marks)

Part III **40 marks**

Q5. Discuss the therapeutic status of a medicine (4 x 5 marks = 20 marks)
Q6. Discuss giving the therapeutic goals the drug treatment of a medical condition (2 x 10 marks= 20 marks)

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ii) PRACTICALS & VIVA
Total marks -100 marks
Practical -70 marks
Viva-voce 30 marks

Practical (70 marks)

1. Clinical Pharmacy	20 marks
2. Clinical Pharmacology	30 marks
3. Attitude, Ethics ,Communication	10 marks
4. Experimental Pharmacology	10 marks

7. RECOMMENDED READING

(A) TEXT

1. Essentials of Medical Pharmacology by K.D. Tripathi latest ed. Jaypee brothers, Medical Publishers, India.
2. Sharma and Sharma's Principles of Pharmacology latest ed. by H. L. Sharma and K. K. Sharma Publishers: Paras Medical Publishers, New Delhi
3. Basic & Clinical Pharmacology Bertram G. Katzung, Susan B. Masters, Anthony J. Trevor, latest ed. McGraw-Hill Companies.

(B) REFERENCE BOOKS

1. Lippincott's Illustrated Reviews : Pharmacology : by Mary J Mycek, Richard A Harvey, Pamela C Champe latest ed Lippincott Williams & Wilkins.
2. Goodman & Gilman's the Pharmacological Basis of Therapeutics by Joel Griffith Hardman, Alfred Goodman Gilman, Lee Limbird, Theodore W. Rall latest ed, McGraw-Hill Professional.

(C) AETCOM module

1. Johnson AR, Siegler M, Winslade WJ. Clinical Ethics: A Practical Approach to Ethical Decisions in Clinical Medicine. New York: Mc Graw Hill Inc, 2015 (latest edition).

2. Timms O. Biomedical Ethics. Elsievier India, 2019 (latest edition)

8. ELECTIVES

May be offered to students in the subject. A student has a choice of four weeks of elective posting after 3rd MBBS part I Professional examination. The departments can offer options for a student to do the same in Pharmacology.

REFERENCES

1. Syllabus Of Pharmacology For Undergraduate Medical Students. https://www.fmsc.ac.in/curriculum/Curriculum%20for%20UG%20Pharmacology.pdf
2. Assessment Module for Undergraduate Medical Education 2019. https://www.nmc.org.in/wp-content/uploads/2020/01/Module_Competence_based_02.09.2019.pdf
3. Competency Based Undergraduate Curriculum For The Indian Medical Graduate 2018. https://www.nmc.org.in/wp-content/uploads/2020/01/UG-Curriculum-Vol-II.pdf

Appendix 1

(I) Concepts of General and Clinical Pharmacology

1. Introduction: definition, historical perspective, branches and scope of the subject of pharmacology and its relation with other medical disciplines.
2. Nature and sources of Drugs, Drug nomenclature and dosage forms.
3. Routes of drugs' administration; advantages and disadvantages of different routes.
4. Pharmacokinetic considerations: drug absorption, distribution, bio transformations and excretion.
5. Pharmacokinetic concepts of bioavailability, apparent volume of distribution (aVd), half life (t½), and clearance (CL) that are used to decide the doses and rational dosing during the drug treatment.
6. Pharmacodynamics; site and mechanism of drug action, drug receptors and receptor regulation, concepts of agonists, antagonists, partial agonist and inverse agonist drugs
7. Quantitative aspect of drug action: analysis of dose response curve and therapeutic index (safety index).
8. Factors affecting drug action and doses, how to prolong or shorten the drug action and effects.
9. Drug interactions and concept of pharmacogenomics/-genetics in drug action, effects and ADRs.
10. Adverse drug reactions (ADRs) and role of pharmacovigilance activity in ADR monitoring.
11. Concept of evidence-based medicine, essential medicines, pharmacoeconomics, Pdrugs and rational prescribing.
12. Development of new drugs : pre-clinical and clinical phases of drug evaluation.
13. Scope and relevance of Clinical Pharmacology.
14. Essential medicine, rationality of fixed dose combinations.
15. Drug regulation acts and other legal aspects.

(b) Systemic Pharmacology – Drug oriented teaching
(Here a core information about drugs is to be given that should include pharmacological actions, mechanism of action, indications, contraindications, side effects, drug interactions, precautions etc.)

(II) Drugs Affecting Autonomic Nervous System (ANS)
16. Introduction to Pharmacology of ANS
17. Cholinergic drugs: cholinoceptor agonist and cholinesterase inhibiting drugs
18. Anticholingergic drugs: cholinoceptor blocking agents
19. Adrenergic drugs: adrenoceptor agonist and sympathomimetic drugs
20 Anti-adrenergic drugs: adrenoceptor antagonists and sympatholytic agents

(III) Drugs Affecting Peripheral Nervous System (PNS)
21. Local anaesthetics
22. Skeletal muscle relaxants

(IV) Drugs Affecting Cardiovascular System (CVS)
23. Drugs affecting vascular tone and volume of circulation, renin angiotensin system and other mechanisms affecting this system
24. Antihypertensive drugs
25. Anti-anginal drugs, management of Myocardial Infarction
26. Drugs for heart failure
27. Anti-arrythmic agents
28. Anti-dyslipidemic agents, drugs used in peripheral vascular disease
29. Nitric oxide donors and inhibitors and basic concepts of treatment of shock

(V) Drugs Affecting Autacoids, Inflammation and Gout
30. Histamine, serotonin & their antagonists, treatment of migraine
31. Prostaglandins, Leukotrienes, Platelet activating factor
32. Non Steroidal Anti inflammatory Drugs
34. Drug treatment of gout, rheumatoid arthritis & other autoimmune diseases

(VI) Drugs Affecting Kidney Function
35. Diuretics
36. Antidiuretics

(VII) Drugs Affecting Respiratory System
37. Antitussives, expectorants, mucolytics
38. Drug treatment of bronchial asthma, Chronic Obstructive Pulmonary disease

(VIII) Drugs Affecting Gastro-intestinal System
39. Drugs for gastric acidity, peptic ulcer & Gastro esophageal reflux disease

40. Antiemetic and prokinetic agents
41. Drugs for constipation and Inflammatory Bowel Disease
42. Antidiarrhoeal agents

(IX) Drugs Acting on Blood
43. Agents used to treat anemias and haematopoietic growth factors
44. Coagulants and anticoagulants
45. Antiplatelet drugs
46. Fibrinolytic, antifibrinolytic, plasma expanders

(X) Drugs Affecting Central Nervous system
47. Introduction and basic concepts of drugs affecting CNS activity: Neurotransmitters and their pathways and important sites of Central Nervous System effect of drugs
48. Sedative hypnotic drugs
49. General anaesthetics with preanaesthetic medications
50. Antiepileptic drugs
51. Antipsychotic drugs
52. Antianxiety drugs
53. Antidepressant and antimaniac drugs
54. Opioid analgesic and antagonists
55. Antiparkinsonian drugs and drugs for other neurodegenerative and movement disorders
56. Pharmacology of ethyl alcohol and other alcohols
57. Pharmacology of CNS stimulants, psychomimetic drugs, drug dependence and substance abuse

(XI) Drugs Affecting Endocrine System and its Diseases
58. Pharmacology of pituitary and hypothalamic hormones
59. Thyroid hormones and antithyroid drugs
60. Estrogen, progesterone and inhibitors
61. Oral contraceptives & Hormone replacement therapy
62. Androgen
63.Drugs for diabetes mellitus: Insulin and oral antidiabetic agents
65. Corticosteroids
66. Parathyroid hormones and drugs affecting calcium balance
67. Drugs acting on uterus
68. Drug treatment for infertility and erectile dysfunctions

(XII) Pharmacology of Chemotherapeutic Agents
69. Introduction and basic principles of chemotherapy of infection, infestation and neoplastic diseases and concepts of resistance to chemotherapeutic agents
70.Sulfonamides
71. Quinolones

72. Beta lactam antibiotics
73. Aminoglycosides
74. Macrolides and ketolides
75. Tetracycline and chloramphenicol
76. Oxazolidinones, streptogramin and other antibiotics
77. Antimycobacterial drugs, antitubercular drugs; treatment of MDR and XDR tuberculosis
78. Antileprosy drugs
79. Antifungal drugs
80. Antimalarial drugs
81. Antiamoebic and other antiprotozoal drugs
82. Drugs used in filariasis and kalaazar
83. Anthelmintic agents
84. Antiviral, anti-AIDS drugs
85. Chemotherapy of Urinary tract infection & Sexually transmitted diseases
86. Basic principles of cancer chemotherapy

(XIII) Immunopharmacology

87. Vaccines, immunomodulators and treatment of transplant rejection disorders

(XIV) Miscellaneous Topics

88. Drugs acting on skin and mucous membrane
89. Vitamins, nutraceuticals and probiotics
90. Pharmacology of Diagnostic agents
91. Paediatric pharmacology
92. Geriatric pharmacology
93. Pharmacology of chelating agents
94. Indian Systems of Medicines

Appendix 2. Certifiable Competencies

	Certifiable competencies	**Number required to certify**
3.1	Write a rational, correct and legible generic prescription for a given condition and communicate the same to the patient	5
3.2	Perform and interpret a critical appraisal (audit) of a given prescription	3
3.3	Perform a critical evaluation of the drug promotional literature	3
3.5	To prepare and explain a list of P-drugs for a given case/condition	3

Appendix 3

M.B.B.S. STUDENT'S LOG BOOK (PHARMACOLOGY)

GENERAL INSTRUCTIONS

1. This logbook is a record of the academic/co-curricular activities in Pharmacology of the designated student.

2. The student is responsible for getting the entries in the logbook verified by the faculty in-charge in the next class.

3. Entries in the Logbook will reflect the activities undertaken in the department of Pharmacology during your course.

4. The student has to get this logbook verified by the mentor and the Head of the department before submitting the application of the University examination.

The log book must have
1) Details of Students
   Name
   Roll Number
2) Details of attendance
3) Details of all skill based exercises done
4) Details of Certifiable skills
5) Details of group discussions/ presentations
6) Details of any project work done
7) Any other Cocurricular activity related to the subject

A format for **Certifiable skill**

Skill: PH 3.1 Write a rational, correct and legible generic prescription for a given condition and communicate the same to the patient

Domain: Skills
Level of competency: Perform
Core: Yes

The student has to perform this activity- Present **five** prescription for common diseases for certification.

Exercise name	Date	Completed		Rating		
		Yes	No	Below expectations	Meet expectations	Exceed expectations

LOG BOOK CERTIFICATE

This is to certify that the candidate Ms _____ Reg No. _____, admitted in the year _____in the _____Medical college, New Delhi, has satisfactorily completed / has not completed all assignments /requirements mentioned in this logbook for Second year MBBS course in the subject of Pharmacology during the period from _____ to _____. She/ is/is not eligible to appear for the summative (University) assessment as on the date given below.

_____

Signature of Faculty Name and Designation

Countersigned by Head of the Department

4. Amendment to Ordinance VI (Clause M. Evaluation and Assessment (19) vide E.C Res. No. 78-9/- dated 25.03.2022]

Existing

Recommendation	Examiner 1	Examiner 2	Examiner 3	Action suggested
Event 1	Accept	Accept	Accept	Viva-Voce
Event 2	Accept	Accept	Minor Correction	Revise thesis in Consultation with Supervisor followed by Viva-voce
Event 3	Accept/ Resubmission	Accept/ Resubmission	Resubmission	Resubmission within one year after incorporating suggestion. Thesis to be sent to all examiners again.
Event 4	Accept	Accept	Reject	Thesis to be sent to fourth examiner whose recommendation shall be final and binding
Event 5	Accept/ Resubmission	Reject	Reject	Reject and cancel registration

For any cases that need special consideration, a special Committee consisting of the Vice-Chancellor/ Pro-Vice-Chancellor, Chairperson of Research Council, Dean of Examination, Chairman of the concerned Board of Research Studies, Head of the concerned department, the Supervisor/s of the candidate, and three Professors of the University of Delhi nominated by the Vice-Chancellor may be referred to for a decision in the matter.

Amended

Recommendation	Examiner 1	Examiner 2	Examiner 3	Action suggested
Event 1	Accept	Accept	Accept	Viva-Voce
Event 2	Accept	Accept	Minor Correction	Revise thesis in consultation with supervisor followed by Viva-Voce
Event 3	Accept/ Resubmission	Resubmission	Resubmission	Resubmission within one year after incorporating suggestion. Thesis to be sent to all examiners again.
Event 4	Accept	Accept	Resubmission	Thesis to be sent to fourth examiner whose recommendation shall be final. If 4th examiner recommends for revision, thesis will be sent to same examiner after revision. Resubmission within one year after incorporating suggestion.
Event 5	Accept	Accept	Reject	Thesis to be sent to fourth examiner. If 4th examiner rejected the thesis, registration of the student shall be closed/ cancelled.
Event 6	Accept/ Resubmission	Reject/ Resubmission	Reject	Reject and cancel registration

For any cases that need special consideration, a special committee consisting of the Vice-Chancellor, Dean of Examination, Dean (Academic), Controller of Examination (If any) may be referred to for a decision in the matter.

REGISTRAR