

Sankalchand Patel University

Faculty of Medicine

**Degree of
Bachelor of Medicine and Bachelor of Surgery (M. B. B. S.)**

Course of Studies Prescribed
For the First, Second and Final M. B. B. S. Examinations

(In force for students admitted in year (2024-25) and thereafter)

PHARMACOLOGY

CURRICULUM/SYLLABUS

&

ASSESSMENT

Teaching & Evaluation Scheme

Semester/Year: Second Year M. B. B. S.
Program Name: Bachelor of Medicine and Bachelor of Surgery (MBBS)
Effective from Academic Year: 2024-2025
Program Code: MB01

Course Code	Subject Name	Hrs/Week			UA		IA		Total	
		L	P	Total	Max	Min	Max	Min	Max	Min
2PH201	Pharmacology-I	3	-	3	100	80	-	-	200	150
2PH202	Pharmacology-II	2	-	2	100		-	-		
2PH203	Pharmacology Practical	-	4	4	100	40	-	-	100	100
2PH204	Pharmacology IA Theory	-	-	-	-	-	100	40	200	
2PH205	Pharmacology IA Practical	-	-	-	-	-	100	40		

Note:

1. Minimum to pass in Internal Assessment: 50% combined in Theory and practical, and must secure At least 40% separately in Theory and Practical of Internal Assessment to be eligible for appearing for University Examinations.

2. Passing Criteria

-In subjects that have two papers, the learner must secure minimum 40% of marks in aggregate (both papers together) to pass in the said subject.

-Criteria for passing in a subject : A candidate shall obtain 50% marks in aggregate and 60:40 (minimum) or 40:60 (minimum) in University conducted examination separately in Theory and in practical (Practical includes; practical/clinical and viva voce) in order to declared as passed in that subject.

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I. GOAL, OBJECTIVES of MBBS PROGRAMME

The undergraduate medical education program is designed with a goal to create an “Indian Medical Graduate” (IMG) possessing requisite knowledge, skills, Attitudes, values and responsiveness, so that she or he may function appropriately and effectively as a physician of first contact of the community while being globally relevant. To achieve this, the following national and institutional goals for the learner of the Indian Medical Graduate training program are hereby prescribed:-

National Goals

At the end of undergraduate program, the Indian Medical Graduate should be able to:

- (a) Recognize “health for all” as a national goal and health right of all citizens and by undergoing training for medical profession to full fill his/her social obligations towards realization of this goal.
- (b) Learn every aspect of National policies on health and devote her/him to its practical implementation.
- (c) Achieve competence in practice of holistic medicine, encompassing promotive, preventive, curative and rehabilitative aspects of common diseases.
- (d) Develop scientific temper, acquire educational experience for proficiency in profession and promote healthy living.
- (e) Become exemplary citizen by observance of medical ethics and fulfilling social and professional obligations, so as to respond to national aspirations.

Institutional Goals

(1) In consonance with the national goals each medical institution should evolve institutional goals to define the kind of trained manpower (or professionals) they intend to produce. The Indian Medical Graduates coming out of a medical institute should:

- (a) Be competent in diagnosis and management of common health problems of the individual and the community, commensurate with his/her position as a member of the health team at the primary, secondary or tertiary levels, using his/her clinical skills based on history, physical examination and relevant investigations.
- (b) Be competent to practice preventive, promotive, curative, palliative and rehabilitative medicine in respect to the commonly encountered health problems.
- (c) Appreciate rationale for different therapeutic modalities; be familiar with the administration of “essential medicines” and their common adverse effects.

- d) Be able to appreciate the socio-psychological, cultural, economic and environmental factors affecting health and develop humane Attitude towards the patients in discharging one's professional responsibilities.
- (e) Possess the Attitude for continued self learning and to seek further expertise or to pursue research in any chosen area of medicine, action research and documentation skills.
- (f) Be familiar with the basic factors which are essential for the implementation of the National Health Programs including practical aspects of the following:
- (i) Family Welfare and Maternal and Child Health (MCH)
 - (ii) Sanitation and water supply
 - (iii) Prevention and control of communicable and non-communicable diseases
 - (iv) Immunization
 - (v) Health Education
 - (vi) Indian Public Health Standards (IPHS), At various levels of service delivery
 - (vii) Bio-medical waste disposal
 - (viii) Organizational and / or institutional arrangements.
- (g) Acquire basic management skills in the area of human resources, materials and resource management related to health care delivery, hospital management, inventory skills and counseling.
- (h) Be able to identify community health problems and learn to work to resolve these by designing, instituting corrective steps and evaluating outcome of such measures.
- (i) Be able to work as a leading partner in health care teams and acquire proficiency in communication skills.
- (j) Be competent to work in a variety of health care settings.
- (k) Have personal characteristics and Attitudes required for professional life such as personal integrity, sense of responsibility and dependability and ability to relate to or show concern for other individuals.
- (2)** All efforts must be made to equip the medical graduate to acquire the certifiable procedural skills – A Comprehensive list of skills recommended as desirable for Bachelor of Medicine and Bachelor of Surgery (MBBS) – Indian Medical Graduate.

Goals and Roles for the Learner

In order to fulfill the goal of the IMG training program, the medical graduate must be able to function in the following roles appropriately and effectively:-

- Clinician who understands and provides preventive, promotive, curative, palliative and holistic care with compassion.

- Leader and member of the health care team and system with capabilities to collect analyze synthe size and communicate health data appropriately.
- Communicator with patients, families, colleagues and community.
- Lifelong learner committed to continuous improvement of skills and knowledge.
- Professional, who is committed to excellence, is ethical, responsive and accountable to patients, community and profession.

Competency Based Training Program of the Indian Medical Graduate

Competency based learning would include designing and implementing medical education curriculum that focuses on the desired and observable ability in real life situations. In order to effectively fulfill the roles as listed in clause 2, the Indian Medical Graduate would have obtained the following set of competencies at the time of graduation:

Clinician, who understands and provides preventive, promotive, curative, palliative and holistic care with compassion

- Demonstrate knowledge of normal human structure, function and development from a molecular, cellular, biologic, clinical, behavioral and social perspective.
- Demonstrate knowledge of abnormal human structure, function and development from a molecular, cellular, biological, clinical, behavioral and social perspective.
- Demonstrate knowledge of medico-legal, societal, ethical and humanitarian principles that influence health care.
- Demonstrate knowledge of national and regional health care policies including the National Health Mission that incorporates National Rural Health Mission (NRHM) and National Urban Health Mission (NUHM), frameworks, economics and systems that influence health promotion, health care delivery, disease prevention, effectiveness, responsiveness, quality and patient safety.
- Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is complete and relevant to disease identification, disease prevention and health promotion.
- Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is contextual to gender, age, vulnerability, social and economic status, patient preferences, beliefs and values.
- Demonstrate ability to perform a physical examination that is complete and relevant to disease identification, disease prevention and health promotion

- Demonstrate ability to perform a physical examination that is contextual to gender, social and economic status, patient preferences and values.
- Demonstrate effective clinical problem solving, judgment and ability to interpret and integrate available data in order to address patient problems, generate differential diagnoses and develop individualized management plans that include preventive, promotive and therapeutic goals.
- Maintain accurate, clear and appropriate record of the patient in conformation with legal and administrative frame works.
- Demonstrate ability to choose the appropriate diagnostic tests and interpret these tests based on scientific validity, cost effectiveness and clinical context.
- Demonstrate ability to prescribe and safely administer appropriate therapies including nutritional interventions, pharmacotherapy and interventions based on the principles of rational drug therapy, scientific validity, evidence and cost that conform to established national and regional health program and policies for the following:
 - (i) Disease prevention,
 - (ii) Health promotion and cure,
 - (iii) Pain and distress alleviation, and
 - (iv) Rehabilitation.
- Demonstrate ability to provide a continuum of care at the primary and / or secondary level that addresses chronicity, mental and physical disability.
- Demonstrate ability to appropriately identify and refer patients whom require specialized or advanced tertiary care.
- Demonstrate familiarity with basic, clinical and translational research as it applies to the care of the patient.

Leader and member of the healthcare team and system

- Work effectively and appropriately with colleagues in an inter-professional health care team respecting diversity of roles, responsibilities and competencies of other professionals.
- Recognize and function effectively, responsibly and appropriately as a health care team leader in primary and secondary health care settings.
- Educate and motivate other members of the team and work in a collaborative and collegial fashion that will help maximize the health care delivery potential of the team.

- Access and utilize components of the health care system and health delivery in a manner that is appropriate, cost effective, fair and in compliance with the national health care priorities and policies, as well as be able to collect, analyze and utilize health data.
- Participate appropriately and effectively in measures that will advance quality of health care and patient safety within the health care system.
- Recognize and advocate health promotion, disease prevention and health care quality improvement through prevention and early recognition: in a) life style diseases and b) cancers, in collaboration with other members of the health care team.

Communicator with patients, families, colleagues and community

- Demonstrate ability to communicate adequately, sensitively, effectively and respectfully with patients in a language that the patient understands and in a manner that will improve patient satisfaction and health care outcomes.
- Demonstrate ability to establish professional relationships with patients and families that are positive, understanding, humane, ethical, empathetic, and trustworthy.
- Demonstrate ability to communicate with patients in a manner respectful of patient's preferences, values, prior experience, beliefs, confidentiality and privacy.
- Demonstrate ability to communicate with patients, colleagues and families in a manner that encourages participation and shared decision-making.

Lifelong learner committed to continuous improvement of skills and knowledge

- Demonstrate ability to perform an objective self-assessment of knowledge and skills, continue learning, refine existing skills and acquire new skills.
- Demonstrate ability to apply newly gained knowledge or skills to the care of the patient.
- Demonstrate ability to introspect and utilize experiences, to enhance personal and professional growth and learning.
- Demonstrate ability to search (including through electronic means), and critically evaluate the medical literature and apply the information in the care of the patient.
- Be able to identify and select an appropriate care pathway that is professionally rewarding and personally fulfilling.

Professional who is committed to excellence, is ethical, responsive and accountable to patients, community and the profession

- Practice selflessness, integrity, responsibility, accountability and respect.
- Respect and maintain professional boundaries between patients, colleagues and society.
- Demonstrate ability to recognize and manage ethical and professional conflicts.

- Abide by prescribed ethical and legal codes of conduct and practice.
- Demonstrate a commitment to the growth of the medical profession as a whole.

II. GOAL, OBJECTIVES OF TEACHING PHARMACOLOGY

Goal: The broad goal of teaching of undergraduate students in Pharmacology is to inculcate a rational and scientific basis of therapeutics.

Objectives

(a) Knowledge

Subject Goals: At the end of teaching learning in pharmacology, the student should be able to:

- Know about essential and commonly used drugs and an understanding of the pharmacologic basis of therapeutics.
- Apply pharmacokinetic and pharmacodynamic concept of drugs to drug selection and dosage regimens. Explain mechanism of action of commonly used drugs.
- Select and rationally prescribe drugs based on clinical condition and the pharmacologic properties, efficacy, safety and cost of medicines for common clinical conditions of national importance.
- Understand generic, branded, over the counter (OTC) and prescription only drugs. Understand pharmacovigilance and identify adverse drug reactions and drug interactions of commonly used drugs.
- Understand essential medicine concept and explore sources of drug information.
- Administer drugs through various common routes of administration.
- Understand and apply concept of evidence based medicine and rational use of drugs.
- Communicate well in imparting drug related information to patients.
- Knows basics of new drug delivery and industry-doctor relationship.
- Critically analyze drug promotional literature and drug formulations.
- Understand regulatory and ethical aspects of drug discovery and drug use.

(b) Skills

At the end of the course the student shall be able to

- Prescribe drugs for common ailments.
- Recognize adverse actions and interactions of commonly used drugs.
- Observe experiments designed for study of effects of drugs, bioassay, and interpretation of the experimental data.
- Scan information uncommon pharmacological preparations and critically evaluate the drug formulations

(c) Integration

- Practical knowledge of use of drugs in clinical practice will be acquired through integrated teaching with clinical *departments and* pre clinical departments.

Distribution of Subject Wise Teaching Hours for Phase-2 MBBS

Subjects	Large group teaching	SGT/ Practicals/ Tutorials/ Seminars	Clinical Postings*	SDL	Total
Pathology	80	170	-	10	260
Pharmacology	80	170	-	10	260
Microbiology	75	143	-	10	228
Community Med (including FAP)	25	0	24	10	59
Forensic Medicine and Toxicology	12	25	-	08	45
Clinical Subjects	60		540	-	600
AETCOM	-	29	-	8	37
Sports, Yoga extra-curricular activities	-	-	-	32	32
Final total	332	537	564	88	1521

SGT: Small group teaching SDL: Self-directed learning

Pl. note: *Clinical postings shall be for 3 hours per day, Monday to Friday.

There will be 15 hours per week for all clinical postings.

III. SYLLABUS–THEORY AND PRACTICALS

General Principles of pharmacology and therapeutics:

- History of pharmacology(Important milestones)
- Sources and uses of drugs Administration of drugs.
- Pharmacokinetics-Processes, first order and zero order kinetics, plasma half-life and steady state concentration
- Pharmacodynamics- Basic mechanisms of drug action and selectivity of action.
- Factor influencing drug effects and drug dosages, drug interactions, drug combinations.
- Principal of drug usage in pediatrics, elderly, during pregnancy and lactation.
- Toxicology and adverse drug reactions, drug overdose, poisoning antidotes, principles of management of a poisoned patient and common poisoning, poison control
- Drug of addiction, principle of management of drug addiction.
- Development of new drugs, stages, ethics of clinical *trials*.
- Concept of essential drugs and rational drug use.
- National drug policy
- Clinical *Pharmacokinetics*, therapeutic drug monitoring.
- Adverse drug reaction monitoring details & phases of clinical trials.
- Less common poisonings(which are more likely to be covered in Forensic medicine and toxicology)

Systemic pharmacology:

(a) Central and peripheral nervous system:

- Local anesthetics
- Sedative hypnotics and drug treatment of insomnia
- Analgesics-opioidanalgesics. Analgesic antipyretics and non-steroid anti-inflammatory drugs Pharmacotherapy of pain and rheumatic disorders.
- Centrally acting muscle relaxants.
- Drug used in epilepsies. Drug treatment of convulsive disorders.
- Alcohols-ethanol and methanol including alcohol dependence and management of poisoning.
- Psycho pharmacological agents, drug treatment of anxiety disorders and mood disorders.
- Drugs of abuse, prevention and management of drug dependence.
- General anesthetics

- Drug therapy of psychoses
- Drugs for parkinsonism
- Drugs for CNS degenerative disorders
- Drugs for My asthenia gravis
- Neuromuscular blocking drugs
- Drugs for treatment of migraine

(b) Autonomic nervous system:

- General Principles of drug action on autonomic nervous system, neurotransmitters, receptors, agonists, antagonist and partial agonists
- Sympathomimetics including adrenaline, noradrenalin, dopamine and beta-2adrenergic agonists and Alpha 1 agonists: phenyle phrine.
- Alpha blockers and beta adrenoceptor blockers.
- Para sympathyomimetics -acetylcholine and its clinically useful substitutes.
- Anti-Muscarinie drugs (Atropine like), treatment of oregano phosphorous insecticides poisoning.
- Drug used for extra pyramidal reactions.
- Ganglionic Stimulants and blockers, adrenergic neuron blockers

(c) Cardiovascular system and drugs acting on kidneys:

- Drugs used in hypertension and drug therapy of essential hypertension
- Drugs used in angina pectoris and drug therapy of angina pectoris and myocardial infarction
- Drugs used in cardiac failure
- Drugs for treatment of hypovolemia and shock.
- Diuretics
- Anti platelet agents and thrombolytic, anticoagulants.
- Drugs for cardiac arrhythmia
- Drugs for hyperlipidaemias

(d) Respiratory drugs, autacoids and the irantagonists:

- Drug used to control cough
- Drug used in bronchial asthma and drug treatment of bronchial asthma.
- Anthistamines and drug treatment of allergic disorders.
- Autacoids-Histamine, 5HTariditsantagonists. Prostaglandins etc.

(e) Gastro intestinal drugs:

- Antiemetic and gastric prokinetic drugs
- Drugs used to control gastric acidity, drug therapy of peptic ulcer, gastro esophageal reflux, dyspepsia
- Purgatives, Drug treatment of diarrheas.
- Choleric, Pancreatic enzymes
- Anorexic drugs and appetite stimulants.

(f) Blood and blood forming agents:

- Drug treatment of iron deficiency and foliate deficiency anemia.
- Other vitamins and minerals
- Growth factors, blood transfusion.

(g) Hormones and hormone antagonists. Drugs acting on uterus;

- Thyroid hormones, Anti thyroid drugs
- Drugs used in the control of diabetes mellitus pharmacotherapy of diabetes mellitus.
- Adrenal corticosteroids-glucocorticoids
- Estrogen and Progestin
- Hormonal contraceptives, chemical contraception
- Oxytocics and uterine relaxants
- androgens
- Sex hormone antagonists
- Ovulation inducing drugs gonadotropins
- Anterior pituitary and hypothalamic releasing hormones.
- Mineral corticoids, adrenocorticoid antagonists
- Parathyroid and related hormones

(h) Chemo therapeutic drugs—drugs used for treatment of infections, anti cancer drugs and immune dilators:

- General principles of chemotherapy
- Chemotherapy and drugs used in:
 - Bacterial infections:
 - Respiratory infections, urinary tract infections gastrointestinal bacterial diarrheas, food poisoning and dysentery, cholera, typhoid fever, common infections of eyes and ears.
 - **Tuberculosis**, Leprosy
 - Sexually transmitted *diseases*. Protozoal infections:
 - Malaria, Amoebiasis, Giardiasis, Kala-azar, Trichomoniasis.

- Drugs for trypanosomiasis, pneumocystosis
- Drugs for toxoplasmosis infestations.
- Helminthic infestations:
- Intestinal nematodes and tapeworms, Filariasis.
- schistosoma and trematodes (fluke)
- Fungal infections:
- Skin, Vagina, C and

idiagnosis Viral infections:

- Anti viral drug including drugs for AIDS

(i) vaccines and sera:

Commonly used vaccines, antisera, anti venoms, immunization schedule for children.

(j) Drugs used treatment of neoplastic diseases: principles of use, and mechanisms, other uses.

(k) Miscellaneous areas:

- Ocular pharmacology-glaucoma, common infections
- Dermatological pharmacology-Drug therapy of common skin disorders
- Environmental and occupational pollutants
- Antiseptics and Disinfectants
- Immuno modulators.

Practical

The syllabus is designed to enable the student to;

- Select and prescribe drugs rationally for common ailments.
- Critically evaluate the drug therapy in given situations.
- Understand and interpret the effects of Drugs on living tissues and animals.
- Dispense simple dosage forms, comment upon different drug formulations and evaluation of drug literature.
- The training in practical and skills will be imparted during practical/demonstration classes in laboratories, and also in forms of tutorials and small group teaching/discussions. The practical teaching is divided as follows;
- Prescription writing and comments/criticism/evaluation of drug therapy in given situation -to be taught by tutorials or group discussions in small groups
- Practical classes in dispensing pharmacy, drug formulations, calculations/dilutions evaluation of drug literature to be taught as laboratory exercises, demonstration, group work.

- Practical classes in experimental/clinical pharmacology will be either performed by students or in form of demonstrations to a small group.
- The students are expected to observe and interpret of these experiments.

IV. INTERNAL EXAMINATION

Rules, Academic Calendar and Pattern for Internal Examination

TERM STARTS: SEPTEMBER

Applicable for batch admitted in MBBS course from academic year 2019-20 & onwards

Ist Internal Exam – Dec 2020 - January 2025

Theory	Internal Theory	Practical	Internal Practical
100 marks	20	100	20

IInd Internal Exam – April-May 2025

Theory	Internal Theory	Practical	Internal Practical
100 marks	20	100	20

Preliminary Exam – July 2025

Theory	Internal Theory	Practical	Internal Practical
Paper I=100marks	20	100	20
Paper II-100 marks			

Remedial Exam – (After preliminary exams)

Theory	Internal Theory	Practical	Internal Practical
Paper I=100marks	20	100	20
Paper II-100 marks			

Tentative University Exam – (August-2025)

Theory
Paper I=100marks
Paper II-100 marks

1. There will be 2 internal assessment examinations and 1 preliminary examination in the academic year. The pattern of the preliminary Theory as well as practical examinations should be similar to University examination.
2. First internal assessment examination will be held in December-January, second internal assessment examination will be held in March and Preliminary examination will be held in July.

3. It is mandatory for the students to appear for all the three examinations. Remedial examination should be taken after the results of preliminary examination are declared and before submission of internal assessment marks to The University.

4. Internal assessment marks for Theory will be converted to out of 100 and marks for practical will be converted out of 100 i.e. 20% marks obtained in Theory and practical should be considered as internal assessment marks.
5. Student must score 50% combined in Theory and practical (not less than 40% in each) for eligibility for appearing for University Examinations. Final internal assessment marks should be rounded off without any decimal.
6. Students who are not eligible for University can give remedial examination organized by The College after preliminary examination and before University Examination to become eligible.
7. If student is not eligible even after remedial measures, he/she have to appear for two internal assessment examination and preliminary examination along with next regular batch of students & marks obtained in this examination will be used to calculate internal assessment marks. Further rules for these students will remain similar to the students admitted in next regular batch.
8. Supplementary University examination shall be held within 45 – 90days of declaration of results of first professional University examinations.
9. Results of internal marks to be displayed on notice board within 1-2weeks of tests.
10. Final internal assessment marks should be rounded off without any decimal.
11. Internal marks should be shown under separate head of passing At University mark sheet /grade card and are **NOT** to be added to final University exams marks
12. Internal Examination Passing criteria-50%marks separately in Theory and Practical Examination

***Above calendar can be subjected to modification as per local situation**

Day today assessment :(Formative) (20 Marks)

- Assignment
- Presentation in Seminar
- Clinical case presentation and participation in discussion
- Participation in Clinical case solving exercises
- Research Project(s)undertaken
- Feedback and reflective writing
- Practical journal/record book
- Logbook(completed with certified competencies)

Pharmacology Practical examination pattern*

Exercises	Marks
Prescription writing	10
Criticize and rewrite prescription	10
Spots	20
Skill assessment– ADR/FDC/P drug/EDL/ Drug promotional literature Dose calculation / Sources of drug information/ Administration of drug on mannequins	30
Journal/Logbook	10
Viva	20
Total	100

***Exercises and marks distribution may vary as per the syllabus of internal examination**

Second MBBS, Internal marks Scheme

Examination	Pharmacology	
	Theory	Practical
First Internal Exam	20	20
Second internal exam	20	20
Preliminary Exams	40	40
Formative (day to day assessment)	20	20
Total	100	100

V. UNIVERSITY EXAMINATION

Rules and Pattern of University examination

Eligibility to appear for final professional examination

- Attendance-75%in Theory and 80%inpractical /clinical
- Minimum 40%marksin Theory internal assessment
- Minimum40%marksinpractical/clinical internal assessment
- Passingcriteria-Minimum50%marksin Theory and 50%marksin practical separately
- Results of internal marks to bedisplayedonnoticeboardwithin1-2weeks of tests.
- Final internal assessment marks should be rounded off without anydecimal.
- Internal marks should be shown under separate head of passing At University mark sheet /grade card and are **NOT** to be added to final University exams marks

University Theory Examination Instructions:

- Two Papers(I and II), 100markseach, No section in papers
- Each Theory paper should contain one applied question of 20(twenty)marks
- Time duration: 3 (three) hours.

Division of Topics for Paper I and II

Paper - I

- **General principles of Pharmacology, essential Drugs, rational Therapy.**
- **Drugs acting on autonomic nervous system and neuromuscular junction.**
- **Drugs acting on central and peripheral nervous system, drug addiction.**
- **Autacoids, drug Therapy of inflammation.**
- **Drugs acting on respiratory system.**
- **Drugs acting on renal and cardio vascular system.**
- **Ocular pharmacology.**
- **Toxicology.**

Paper - II

- **Drugs affecting gastrointestinal function.**
- **Drugs affecting uterine motility.**
- **Chemo Therapy of microbial diseases and parasitic infections.**
- **Chemo Therapy of cancer, immune-modulators**
- **Drugs acting on blood forming organs.**
- **Hormones and hormone antagonists.**
- **Vitamins and Pharmacology of skin.**

Question Paper I and II pattern: Section-A (50 Marks)

No	Type of questions	Marks
Q1.	Long essay question (Structured / Case Based)(any1 out of 2)1x10 <i>Describe Pharmacotherapy of</i>	10
Q2.	Short Answer Questions (any 6 out of 7) 6 x 5 (One AETCOM Question is Compulsory) <i>Pharmacotherapy of ...</i> <i>Mention The Therapeutics uses & Adverse drug reactions of ...</i>	30
Q3.	Ultra short Short Answer Questions (any 5 out of 6) 5 x 2 <i>Liquid paraffin is preferred in constipation during pregnancy. Give reasons.</i>	10
	Total	100

Question Paper I and II pattern: Section-B (50 Marks)

No	Type of questions	Marks
Q4.	Long essay question (Structured / Case Based)(any1 out of 2)1x10 <i>Describe Pharmacotherapy of</i>	10
Q5.	Short Answer Questions (any 6 out of 7) 6 x 5 (One AETCOM Question is Compulsory) <i>Pharmacotherapy of ...</i> <i>Mention the Therapeutics uses & Adverse drug reactions of ...</i>	30
Q6.	Multiple Choice Questions(10 out of 10) <i>Avoid as simple recall of facts (emphasis is on interpretation and problem solving)</i>	10
	Total	50

University Practical Exam Instructions:

- Total 6 examiners (3pairs); Marks should be given by a pair of examiners and not by single examiner.
- Marks should be entered directly on the mark sheet.
- Sealed original and duplicate mark sheet should be submitted at the end of each session

Practical examination Pattern

No.	Type of questions	Marks
1.	Write a rational, correct & legible prescription for given condition	20
2.	Critical appraisal(audit) of a given prescription and rewrite corrected prescription	10
3	Short Table Exercise(spots) <i>(interprets the effect on drug using graph, dosage formulations, identify the Adverse drug reaction, Clinical problem solving etc.)</i>	20
4	Skill assessment <i>(Selection of most appropriate drug in given case, setting up the drip, dosage calculation, administration of drug in simulated environment using manikins, critical evaluation of the drug promotional literature, critical evaluation of the dosage formulations etc.)</i>	30
5.	Viva Voce	20
	Total	100

COMPETENCY

Number	The student should be able to
PHARMACOLOGY (Topics=10, Competencies=92)	
Topic1:GeneralPharmacology(GP) Number of competencies:(13)	
PH1. 1	Describe the principles of pharmacology, pharmaco Therapeutics and define various terms in pharmacology.
PH1. 2	Describe evidence based medicine and rational use of Drugs & discuss why These are relevant to Therapeutics.
PH1. 3	Describe nomenclature of Drugs i. e., generic, branded Drugs and scheduled Drugs , explaining the utility of the nomenclature, cost effectiveness and use.
PH1. 4	Identify the common drug formulations and drug delivery systems, demonstrate Their use and describe Their advantages and disadvantages.
PH1. 5	Describe various routes of drug administration, Their advantages and disadvantages and demonstrate administration of , e. g. , SC, IV, IM, SL, rectal, spinal, sublingual, intranasal sprays and inhalers
PH1. 6	Describe salient features of absorption, distribution, metabolism and excretion of Drugs with emphasis on various routes of drug administration
PH1. 7	Describe various principles of mechanism of action of drugs
PH1. 8	Demonstrate the mechanism of action & effects of common proto type drugs on human body using computer assisted learning
PH 1. 9	Select rational drug combinations based on the pharmacokinetics/pharmacodynamic (PK/PD) parameters with emphasis on synergism, antagonism, „Therapeutic efficacy“, risk benefit ratio
PH1. 10	Describe changes in pharmacology of Drugs in geriatric, pediatric and special situations such as Pregnancy, lactation, hepatic and renal Disorders and adjust the drug treatment accordingly.
PH1. 11	Define Adverse Drug Reactions (ADRs)&their types. Identify the ADRs in the given case scenario and assess causality.
PH1. 12	Define Pharmacovigilanceits principles and demonstrate ADR reporting
PH1. 13	Identify and describe the management of drug inter actions

Topic2:Autonomic&PeripheralNervoussystem, Autacoids	
Number of competencies:(8)	
PH2. 1	Describe types, salient pharmacokinetics, pharmacodynamics, Therapeutic uses, adverse drug reactions of adrenergic and anti adrenergic drugs
PH2. 2	Describe types, salient pharmacokinetics, pharmacodynamics, Therapeutic uses, adverse drug reactions of cholinergic and anti cholinergic drugs and demonstrate OPC poisoning management
PH 2. 3	Explain Therationale and demonstrate the emergency use of various sympathetic and parasympathetic drug agonists/antagonists(like Noradrenaline/ Adrenaline/Dopamine/Dobutamine, Atropine) in case-based scenarios
PH2. 4	Explain salient pharmaco kinetics, pharmacodynamics, Therapeutic uses, adverse drug reactions of skeletal muscle relaxants
PH2. 5	Explain types, salient pharmacokinetics, pharmacodynamics, Therapeutic uses, adverse drug reactions of local anaesthetics (LA) & demonstrate various methods of administration of LA
PH2. 6	Explain types, salient pharmacokinetics, pharmacodynamics, Therapeutic uses, adverse drug reactions of anti-histaminics and explain management of common cold & allergic rhinitis.
PH2. 7	Define pain and enumerate drugs used for pain. Explain salient pharmacokinetics, pharmacodynamics, Therapeutic uses, adverse drug reactions of analgesics including NSAIDs (except opioids)
PH2. 8	Devise management plan for a case of gout, arthritis and migraine using appropriate drugs
PH3. 1	Describe types, salient pharmacokinetics, pharmacodynamics, Therapeutic uses, adverse drug reactions of General anaesthetics, and pre-anaesthetic medications
PH3. 2	Describe types, salient pharmacokinetics, pharmacodynamics, Therapeutic uses, adverse drug reactions of different sedative and hypnotic agents and explain pharmacological basis of selection and use of different sedative and hypnotic agents
PH3. 3	Describe types, salient pharmacokinetics, pharmacodynamics, Therapeutic uses, adverse drug reactions of Drugs used in epilepsy and devise management plan for a case of uncontrolled seizure

PH3. 4	Describe types, salient pharmacokinetics, pharmacodynamics, therapeutic uses, adverse drug reactions of drugs of opioid analgesics and explain the special instructions for use of opioids.
PH3. 5	Describe types, salient pharmacokinetics, pharmacodynamics, Therapeutic uses, adverse drug reactions of Drugs used for depression and psychosis, devise management plan for depressive and psychotic disorders
PH3. 6	Describe types, salient pharmacokinetics, pharmacodynamics, Therapeutic uses, adverse drug reactions of drugs used in anxiety disorders. Discuss about general goals of Pharmacotherapy for the management of above disorders
PH3. 7	Explain types, salient pharmacokinetics, pharmacodynamics, Therapeutic uses, adverse drug reactions of drugs used for Parkinsonism and other neurodegenerative disorders. Write a prescription to manage a case of drug induced parkinsonism
PH3. 8	Identify and manage methanol poisoning and chronic ethanol in toxication
PH3. 9	Describe the Drugs that are abused and cause addiction (dependence, addiction, stimulants, depressants, psychedelics, Drugs used for Criminal offences). Explain the process and steps for management of drug de addiction

Topic4:Cardiovascularsystem&Bloo Number of competencies:(11)	
PH4. 1	Explain types, salient pharmaco kinetics, pharmaco dynamics, therapeutic uses, adverse drug reactions of drugs used for different anaemias and thrombocytopenia.
PH4. 2	Explain types, salient pharmacokinetics, pharmaco dynamics, Therapeutic uses, adverse drug reactions of drugs acting on coagulation system (Coagulants/anticoagulants) and devise a plan to monitor Therapy and management of adverse effects.
PH4. 3	Describe types, salient pharmacokinetics, pharmaco dynamics, and Therapeutic uses, adverse drug reactions of Fibrinolytics and Antifibrinolytic agents.
PH4. 4	Explain types, salient pharmacokinetics, pharmacodynamics, Therapeutic uses, and adverse drug reactions of Anti platelets agents.
PH4. 5	Explain types, salient pharmacokinetics, pharmacodynamics, Therapeutic uses, adverse drug reactions of Diuretics, anti diuretics- vasopressin and analogues
PH4. 6	Explain salient pharmacokinetics, pharmacodynamics, Therapeutic uses, and adverse drug reactions of drugs modulating rennin angiotensin aldosterone system.
PH4. 7	Explain types, salient pharmacokinetics, pharmacodynamics, Therapeutic uses, adverse drug reactions of drugs used for the management of hypertension Devise plan for pharmacologic management of hypertension with Diabetes, Pregnancy induced hypertension and hypertensive emergency and urgency
PH4. 8	Describe types, salient pharmacokinetics, pharmacodynamics, Therapeutic uses, adverse drug reactions of drugs used for the management of ischemic heart disease (stable, unstable angina and myocardial infarction), peripheral vascular disease and devise management plan for a patient of acute myocardial Infarction
PH4. 9	Explain salient pharmacokinetics, pharmacodynamics, Therapeutic uses, and adverse drug reactions of drugs used for the management of heart failure. Devise management plan for heart failure patients and Describe the strategies to prevent long term complications of heart failure.
PH4. 10	Explain salient pharmacokinetics, pharmacodynamics, Therapeutic uses, adverse drug reactions of drugs used for cardiac arrhythmias. Devise a plan to manage a patient with supraventricular, ventricular arrhythmias, cardiac arrest and fibrillations
PH4. 11	Explain salient pharmacokinetics, pharmacodynamics, Therapeutic uses, adverse drug reactions of drugs used for the management of dyslipidaemias and enumerate drugs leading to dyslipidaemias

Topic5:Respiratorysystem	
Number of competencies:(2)	
PH5. 1	Devise management of various stages of Bronchial asthma, COPD. Explain salient pharmacokinetics, pharmacodynamics, Therapeutic uses, adverse drug reactions of drugs used for the management of Bronchial asthma, COPD and Rhinitis.
PH5. 2	Explain types, salient pharmacokinetics, pharmacodynamics, Therapeutic uses, adverse drug reactions of drugs used for cough management. Describe management of dry & productive cough
Topic6: Gastrointestinalsistem	
Number of competencies:(5)	
PH6. 1	Explain types, salient pharmacokinetics, pharmacodynamics, Therapeutic uses, adverse drug reactions of drugs used in Acid peptic diseases including Peptic Ulcers, GERD and devisea management plan for a case of peptic ulcer.
PH6. 2	Describe types, salient pharmacokinetics, pharmacodynamics, Therapeutic uses, adverse drug reactions of pro kinetics & drugs used for emesis and antiemetics.
PH6. 3	Describe salient pharmacokinetics, pharmacodynamics, Therapeutic uses, adverse drug reactions of drugs used for the management of diarrhea and devise pharmaco therapeuticplanto manage acute and chronic diarrhoea in adults and children.
PH6. 4	Describe salient pharmacokinetics, pharmacodynamics, adverse drug reactions of drugs used for the management of constipation and devise management plan for a case of constipation
PH6. 5	Describe salient pharmacokinetics, pharmacodynamics, adverse drug reactions of drugs used for the management of Inflammatory Bowel Disease and Irritable Bowel Disorders
Topic7:Endocrinesystem	
Number of competencies:(9)	
competencies that require certification:(NIL)	
PH7. 1	Describe the types, kinetics, and dynamics, adverse drug reactions of drugs used in diabetes mellitus and devise management for an obese and non-obese diabetic patient & also comment on prevention of complications of the diabetes.
PH7. 2	Describe the types, kinetics, dynamics, Therapeutic uses, adverse drug reactions of Drugs used in osteoporosis and devise management plan for a female and male patient with osteoporosis.
PH7. 3	Describe The types, kinetics, dynamics, adverse drug reactions of drugs used in thyroid Disorders and devise a management plan for a case With thyroid Disorder.

PH7. 4	Describe the types, mechanisms of action, adverse effects, indications and contraindications of the drugs which modify the release of Anterior Pituitary Hormones
PH7.5	Explain the types, kinetics, dynamics, adverse effects, indications and contraindications of corticosteroids and communicate to patient the appropriate use of corticosteroids
PH7. 6	Describe the types, kinetics, dynamics, adverse effects, indications and contraindications of androgens and drugs used of Erectile Dysfunction
PH7. 7	Explain the types, kinetics, dynamics, adverse effects, indications and contraindications of drugs which modify Female Reproductive Functions including contraceptives. Explain the important instruction for use of female and male contraceptives
PH7. 8	Explain the types, kinetics, dynamics, adverse effects, indications and contraindications of uterine relaxants and stimulants.
PH7. 9	Describe Drugs used for treatment of Infertility

Topic8: ChemoTherapy

Number of competencies:(11)

PH8. 1	Discuss general principles of chemo Therapy with emphasis on antimicrobial resistance.
PH8. 2	Discuss rational use of antimicrobials and describe antibiotic stewardship program of your institute
PH8. 3	Explain the kinetics, dynamics, adverse effects, indications of the following antibacterial drugs: Sulphonamides, Quinolones, Beta- lactams, Macrolides, Tetracyclines, Aminoglycosides, and newer antibacterial drugs
PH8. 4	Devise a pharmacotherapeutic plan for UTI and STDs and explain to patient the instructions and adherence to treatment.
PH8. 5	Explain the types, kinetics, dynamics, therapeutic uses and adverse effects of drugs used in tuberculosis. Devise management plan for tuberculosis treatment in various categories.
PH8. 6	Discuss the types, Kinetics, dynamics, adverse effects for Drugs used for Leprosy and outline management of Leprosy reactions
PH8. 7	Discuss the types, Kinetics, dynamics, adverse effects of Drugs used for following Protozoan / Vector borne diseases: 1. Amoebiasis 2. Kala-azar 3. Malaria Filariasis
PH8. 8	Explain the types, kinetics, dynamics, adverse effects of Drugs used for fungal infections

PH8. 9	Discuss the types, kinetics, dynamics, adverse effects of Drugs used for Intestinal Helminthiasis
PH8. 10	Discuss the types, kinetics, dynamics, adverse effects, indications and contraindications of drugs used for viral diseases including HIV
PH8. 11	Describe the types, kinetics, dynamics, adverse effects, indications and contraindications of anti-cancer drugs. Devise plan for amelioration of anticancer drug induced toxicity.

Topic9:Miscellaneous Number of competencies (7)	
PH9. 1	Describe the types, kinetics, dynamics, therapeutic uses, adverse drug reactions of immune modulators
PH9. 2	Describe management of common drug poisonings, insecticides, common stings and bites
PH9. 3	Describe chelating agents and make a plan for management of heavy metal poisoning
PH9. 4	Describe basics of vaccine use and types of vaccines
PH9. 5	Describe types, precautions and uses of antiseptics and disinfectants
PH9. 6	Describe drugs used in various skin disorders like acne vulgaris, scabies, pediculosis, psoriasis including sunscreens
PH9. 7	Describe drugs used in glaucoma and other ocular disorders including topical (ocular) drug delivery systems

Topic10:AppliedPharmacology Number of competencies:(17)	
PH10. 1	Compare and contrast different sources of drug information and update on latest information on drugs
PH10. 2	Perform a critical evaluation of the drug promotional literature and , Interpret the package insert information contained in the drug package
PH10. 3	To prepare and explain a list of P-drugs for a given case/condition
PH10. 4	Describe parts of a correct, rational and legible prescription and write rational prescriptions for the provided condition. (examples of conditions to be used are given with other relevant competencies)
PH10. 5	Identify and apply the legal and ethical regulation of prescribing drugs Especially when prescribing for controlled drugs, of f-label medicines, and prescribing for self, close family and friends
PH10. 6	Perform a critical appraisal of a given prescription and suggest ways to improve it.
PH10. 7	Describe Pharmacogenomics and Pharmacoeconomics and manage genomic& economic issues in drug use and find out the price of given medication(s).
PH10. 8	Describe Essential medicines, Fixed dose combination, Over the counter

	drugs and explain steps to choose essential medicines.
PH10. 9	Calculate the dosage of drugs for an individual patient, including children, elderly, pregnant and lactating women and patients with Renal or hepatic dysfunction.
PH10. 10	Identify when therapeutic drug monitoring is considered for a particular patient, determine timing of sampling and calculate revised dose.
PH10. 11	Identify and apply drug Regulations principles, acts and legal aspects related of drug discovery and clinical use
PH10. 12	Describe overview of drug development including phases of clinical trials and Good Clinical Practice & reflect on the role of research in developing new drugs
PH10. 13	Demonstrate how to optimize interaction with pharmaceutical representative/media to get/disseminate authentic information on drugs
PH10. 14	Communicate with the patient regarding optimal use of a drug therapy using empathy and professionalism. g. Oral contraceptives, anti TB Drugs etc.
PH10. 15	Describe methods to improve adherence to treatment and motivate patients with chronic diseases to adhere to the prescribed Pharmacotherapy
PH10. 16	Demonstrate an understanding of the caution in prescribing drugs likely to produced dependence and recommend the line of management
PH10. 17	Demonstrate ability to educate public& patients about various aspects of drug use including drug dependence and OTC drugs

Marks distribution for various subjects for University Annual Examinations

Pharmacology- 2 papers

Paper 1-100 Marks

Paper 2-100 Marks

Practical: 100 Marks

Mandatory to get 40% marks separately in Theory & in Practical; and totally 50% for Theory plus Practica

