

**Cytology slides (for spotting)**

1. Fibroadenoma
2. Granulomatous reaction lymph node
3. Squamous cell carcinoma sputum
4. Cervical smear Invasive squamous cell carcinoma
5. Adenocarcinoma in body fluids
6. Papillary carcinoma thyroid

**Recommended Textbooks**

Pathologic Basis of Disease-Robbins and Cotran 7th edition  
Text Book of Pathology-Harsh Mohan 6th edition  
General and Systematic Pathology-5th edition-JCE Underwood  
Haematology-G E De Gruchy  
Text and Practical Haematology MBBS-Tejinder singh  
Manual of Basic Techniques for Health laboratory-WHO

**PHARMACOLOGY****I. Goal:**

The broad goal of teaching Pharmacology to undergraduates is

- To impart knowledge, skills and attitudes to the students so that they can prescribe drugs safely, effectively and maintain competency in professional life.
- To inculcate in them a rational and scientific basis of therapeutics.

**II. Educational Objectives. a)****Knowledge**

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

- describe the pharmacokinetics and pharmacodynamics of essential and commonly used drugs
- list the indications, contraindications, interactions and adverse reactions of commonly used drugs
- indicate the use of appropriate drug in a particular disease with consideration of its cost, efficacy and safety for individual needs, and mass therapy under national health programmes
- integrate the list the drugs of addiction and recommend the management
- classify environmental and occupational pollutants and state the management issues
- explain pharmacological basis of prescribing drugs in special medical situations such as pregnancy, lactation, infancy, old age, renal and hepatic failure
- explain the concept of rational drug therapy in clinical pharmacology with special focus to usage of antimicrobial drugs.
- prescribe drugs for the control of fertility and be aware of the effects of drugs on the foetus.
- describe the clinical presentation and management of common poisoning including the bites and stings.

- state the principles underlying the concept of 'Essential Drugs'
- evaluate the ethics and modalities involved in the development and introduction of new drugs
- understand principles of Evidence based Medicine
- understand the principles of pharmacoeconomics

**(b) Psychomotor Skills:**

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

- prescribe drugs for common ailments
- identify adverse reactions and interactions of commonly used drugs
- interpret the data of experiments designed for the study of effects of drugs and bioassays which are observed during the study
- scan information on common pharmaceutical preparations and critically evaluate drug formulations
- load the required dose of medicines accurately in hypodermic syringes; inject medicines by the intradermal, subcutaneous, intramuscular and intravenous routes using aseptic techniques.
- Set-up an intravenous drip and adjust the drip rate according to required dosage.
- calculate the drug dosage using appropriate formulae for an individual patient.
- administer the required dose of different drug formulations using appropriate devices and techniques (e.g., hypodermic syringes, inhalers, transdermal patches etc.)
- Advise and interpret the therapeutic monitoring reports of important drugs
- recognize and report adverse drug reactions to suitable authorities.
- analyse critically, drug promotional literature for proprietary preparations in terms of
  - (a) Pharmacological actions of their ingredients
  - (b) Claims of pharmaceutical companies
  - (c) Economics of use
  - (d) Rational or irrational nature of fixed dose drug combinations.
- retrieve drug information from appropriate sources especially electronic resources

**(c) Attitudes & Communication skills:**

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

- communicate with patients regarding proper use of drug
- take adequate precaution during prescribing drug(s)
- understand the legal aspects of prescription
- counsel patients for compliance
- take adequate care to write prescriptions legibly
- understand rationality of polypharmacy
- update themselves regarding recent advances

- Basic Clinical communication skills

Examples of good and poor communication as Role Play - affecting rapport with patient and family, therapeutic relationship, trust, diagnosis and management. The stages of grief as described by Elisabeth Kubler Ross

**(d) Integration**

Practical knowledge of rational use of drugs in clinical practice will be acquired through integrated teaching vertically with pre-clinical & clinical subjects and horizontally with other para-clinical subjects.

### DETAILED SYLLABUS

1. Period of training: 3rd, 4th & 5th Semester
2. Duration of training: one and a half years
3. Eligibility: Must have cleared Phase I (Anatomy, Physiology, Biochemistry)
4. Time available for teaching: 300 hours

**Lectures: 125 hours Practicals: 75 hours**

Innovative sessions & Internal Assessments: 100 hours

DETAILS OF LECTURES Topic Time (hours) Part I (Drug Oriented teaching)

#### **1. General Pharmacology and basic concepts of clinical Pharmacology 16 hours**

- Introduction – definition, scope, various branches, drug nomenclature, orphan drugs
- Mechanism of drug action /Pharmacodynamics ( Receptor/Molecular mechanism is desirable to know)
- Scope & relevance of clinical pharmacology
- Routes of administration of drugs, new drug delivery system.
- Pharmacokinetics – Absorption, distribution, metabolism and excretion.
- Factors modifying drug action and drug dosage
- Drug interactions and pharmacogenomics
- Adverse drug reactions and Pharmacovigilance; Therapeutic drug monitoring and adherence
- Essential drugs and fixed drug combination including pharmacoeconomics
- Rational use of drugs

#### **2. Autonomic nervous system 12 hours**

- Cholinergic neurotransmission and cholinergic drugs
- Anticholinergics
- Adrenergic neurotransmission and adrenergic drugs
- Antiadrenergic drugs Skeletal muscle relaxants NO, VIP (self-study)

#### **3 Autacoids and related drugs 3 hours**

Histamine receptor antagonists, their pharmacological actions, indications, adverse effects and precautions

Pharmacology of drugs on prostaglandins and leukotrienes

5HT receptors and their antagonists including treatment of migraine

#### **4 Central nervous system 24 hours**

Drugs used in epilepsy and neuropathic pain ; selection of appropriate drug for various

types of epilepsy and adverse drug effects

Sedative – hypnotics used currently in clinical practice, indications contraindications, adverse effects, drug interactions

Opioid analgesics: Pharmacological actions, indications, contraindications adverse effects and drug interactions of commonly used analgesics

NSAIDs: Pharmacological action, indications, contraindications, adverse effects and drug interactions of commonly used drugs. WHO Analgesic ladder Ladder Drugs and Emphasise on practical application of NSAIDs, weak and strong opioids.

Drug used in the treatment of parkinson's disease: anticholinergic agents, dopamine agonists, MAOI, COMTI: Their indications, contraindications, adverse effects and drug interactions.

Disease modifying agents in the treatment of rheumatoid arthritis.

Pharmacology of ethanol and methanol poisoning

Agents used in the treatment of gout (acute and chronic)

Antidepressants use in neuropathic pain

Drugs of addiction abuse and dependence (self-study)

Drugs in manic depressive illness and psychosis General anaesthetics; cardinal features, merits and

demerits of commonly used anaesthetics ,drug interactions

Preanaesthetic agents; uses, indications, contraindications adverse effects and drug interactions.

Local anaesthetic agents: Pharmacological basis, adverse drug reactions, indications and complications of spinal anaesthesia

Adjuvant analgesics – and use in chronic pain

Drugs for treatment of Alzheimer's disease and cognitive enhancers – (seminar )

### **5 Cardiovascular System**

**15 hours**

Anti-hypertensive drugs: MOA; adverse drug reactions drug interactions and basis of combining commonly used drugs

Pharmacology of calcium channel blockers Drugs affecting Renin-Angiotensin system Approaches to treatment of myocardial infarction. Drug used in treatment of angina pectoris.

Drug treatment of peripheral vascular disease (self-study)

Management of pain in PV diseases Pharmacology of vasodilators and cardiac glycosides; usage in CHF

Treatment of Paroxysmal supraventricular tachycardia, atrial dysrhythmias, sudden cardiac arrest and ventricular fibrillation.

Diuretics: Mechanism of action, pattern of electrolyte excretion under their influence, short term side effects and long term complications of diuretic therapy, therapeutic uses of diuretics; antidiuretics.

### **6. Drugs affecting blood and blood formation**

**6 hours**

Anticoagulants: MOA of heparin and oral anticoagulants indications, monitoring of therapy and treatment of bleeding due to their overdose, drug interactions.

Drugs inhibiting platelet aggregations, their indications and precaution for their use

Antianaemic drugs (seminar)

Treatment of shock (seminar)

Fibrinolytics and antifibrinolytics: indications, adverse reactions.

Hypolipidemics: MOA, adverse reactions and indications

### **7. Respiratory system**

**2 hours**

- Drug use in treatment of bronchial asthma
- Antitussives, expectorants & mucolytics (seminar)

### **8. GIT**

**3 hours**

- Pharmacotherapy of peptic ulcer: MOA, adverse drug reactions, contraindication and precautions

Antiemetics: MOA, uses, side effects.

Drug used in ulcerative colitis and irritable bowel syndrome Management of constipation and diarrhoea (seminar)

### **9. Drugs acting on Endocrine system**

**9 hours**

- Thyroid hormones and antithyroid drugs: pharmacological action, indications, contraindications and side effects
- Drugs use for pharmacotherapy of diabetes mellitus, mechanism of actions, contraindications, precautions during the use and side effects. Management of iatrogenic hypoglycemia and diabetic ketoacidosis.
- Sex hormones, their analogues and antagonists, uses in replacements and pharmacotherapy. Outlining the rational for such use, C/I and side effects.
- Pharmacological approaches to contraception, side effects, precautions during use and C/I.
- Uterine relaxants, and uterine stimulants, indications, side effects, C/I
- Hormones of adrenal cortex, their synthetic analogues, pharmacological actions, therapeutic uses, precautions, side effects and contraindications. Hormones and drugs affecting calcium metabolism, therapeutic indications, contraindications and side effects
- Drugs used in the treatment of infertility (self-study)

### **10. Chemotherapy**

**17 hours**

- General principals of chemotherapy, rational use of antimicrobial agents, indications for prophylactic and combined uses of antimicrobials including pre and probiotics
- Chemotherapeutic agents: penicillins, cephalosporins, aminoglycosides, broad spectrum antimicrobial agents, quinolones, sulphonamides macrolides and other newer drugs: their mechanism of actions, s/e, indications, resistance, and drug interactions. Drugs used for the treatment and prevention of infections – examples Tuberculosis, Leprosy, Malaria, Amoebiasis and other Protozoal infections, Fungal infections, Viral infections including HIV, STD, Helminthiasis, Leptospirosis etc.
- Antiseptics, disinfectants and their use based on their pharmacological properties. (Seminar) Anticancer drugs, mechanism of action, indications, s/e, C/I, Precautions , Pharmaco-economics.

**Toxicology**

General principles of treatment of poisoning

Management of overdose with commonly used therapeutic agents

Heavy metal poisoning and heavy metal antagonists (seminar)

**Miscellaneous**

Vaccines (self-study)

Drugs modulating Immune system (seminar)

Vitamins, Nutritional supplement (self study)

Gene therapy (seminar)

Drugs acting on skin & mucus membrane (seminar)

Sports medicine (self-Study)

Antioxidants (self-Study)

**Part II (Clinical Pharmacology and Therapeutics)****National Health programmes like:**

1. Tuberculosis
2. Leprosy
3. HIV
4. Malaria
5. Syphilis and gonorrhea & STD (seminar)
6. Upper and lower respiratory infections;
7. OCP
8. Filariasis
9. Anaemia
10. Diabetes Mellitus

Rationale, regimen, prescription of the medicines and regimens used for national programs, basic counseling in these scenarios .

**Infective/Parasitic conditions**

1. Influenza
2. Urinary Tract infections (seminar)
3. Typhoid and other GIT infections
4. Amoebiasis
5. Worm infestations (seminar)
6. Fungal infections
7. Herpes and Hepatitis, other antivirals

**Medical emergencies , Managing a Pain crisis**

1. Acute myocardial infarction, acute angina attack, circulatory failure, sudden cardiac arrest, hypertensive emergencies
2. Acute anaphylaxis and other acute allergic states
3. Snake bites and insect bites

4. Acute poisoning and drug overdosage
5. Status epilepticus, febrile convulsions, acute mania
6. Acute severe asthma, acute rheumatic fever, acute gout
7. Acute colicky pains-intestinal, biliary, renal
8. Post-partum haemorrhage, uterine inertia

**Other topics**

1. Treatment of pain , , Assessment, classification, management, Application of WHO Analgesics  
– as a seminar
  2. Treatment of insomnia
  3. Treatment of cough
  4. Treatment of fever of unknown origin (PUO)
  5. Drugs used in labour
  6. IV fluids
  7. Clinical uses of glucocorticoids
  8. P-drug or how to select a drug for a given patient in a given situation
  9. Essential drugs
  10. Drug therapy in special situations (pregnancy, lactation, children, geriatrics, renal and hepatic diseases)
- Details of Practicals**
1. Dosage forms Oral, Parenteral, Topical & Others
  2. Routes of drug administration, setting up an intravenous drip
  3. Calculation of drug dosage
  4. Sources of drug information-how to retrieve information
  5. ADR monitoring
  6. Critical appraisal of drug promotional literature
  7. Essentials of Clinical trials
  8. Communicating to patients on the proper use of medication.
  9. Prescription writing, prescription auditing based on rational drug use and FDC
  10. Essential drugs list , National List of Essential drugs for India – adults, children and why are those particular drugs included. Controlled drugs amongst the essential list and their availability.
  11. Use of drugs in pregnancy, lactation, children and elderly
  12. Use of drugs in liver disease and renal disease
  13. Preparation of percentage solution
  14. Preparation and use of oral rehydration solution
  15. Informed Consent Form (To teach it more as a document of good communication, trust and shared planning for care than as a legal requirement. )
  16. Computer assisted learning (CAL)
  17. Experimental pharmacology charts interpretation
  18. Drug/drug and Drug/Food interaction.
  19. Selection of P-drug
  20. Irrational drug combinations, fallacies of using pre-combined drugs

**Teaching-Learning methods:**

Small group discussions, tutorials, project work and seminars. An overlap between theory and practical classes will serve to reinforce and complement the two. Points not covered in theory can be covered during practical classes.

**Project work**

Each student has to collect data of one clinical case and write it down as project. Topics for Seminars (2 hours each)

1. Antianaemic drugs
2. Antitussives
3. Shock
4. Alzheimer's disease and cognitive enhancers, neurodegenerative disorders.
5. Anthelmintics
6. Calcium metabolism
7. Dermatology – drugs acting on skin and mucous membrane
8. UTI & STD
9. Irritable bowel syndrome, ulcerative colitis & Eye disorders
10. Immuno Pharmacology
11. Laxatives and antidiarrhoeals
12. Alcohol
13. Osteoporosis, obesity, genetherapy
14. Heavy metal poisoning and heavy metal antagonists
15. Antiseptics
16. Superinfection, prophylactic use and misuse of antibiotics
17. Using analgesics in patients with poor renal function
18. Management of infections which are to be cared for without antibiotics – diarrhoeas, URTI, Uro-genital

**Topics for self-study**

1. Treatment of rhinitis
2. Carminatives, digestants & antifatulents
3. Vitamins and antioxidants
4. Vaccines
5. Drug induced blood dyscrasias
6. Treatment of vertigo
7. Other protozoal infections
8. Drugs in pregnancy and infants.
9. NO, VIP
10. Drugs of addiction
11. Drug treatment of peripheral vascular disease
12. Anterior pituitary hormones
13. Drugs used in the treatment of infertility

14. Reactive oxygen species
15. Speciality based prescriptions and the resultant Polypharmacy – the new healthcare issue

**Recommended books for undergraduates**

1. Essentials of Medical Pharmacology by K.D.Tripathi (Prescribed)
2. Medical Pharmacology 3rd edition by Dr Padmaja Udaykumar (Prescribed)
3. Principles of Pharmacology by H.L.Sharma, K.K.Sharma (Prescribed)
4. Pharmacology and Pharmacotherapeutics. R.S Sathoskar and Bhandarkar (Prescribed)
5. Basic and Clinical Pharmacology Lange publications by Bertram G Katzung (Reference)
6. Pharmacology by HP Rang. M M Dale, J.M Ritter, P.K.Morore (reference)
7. The Pharmacological Basis of Therapeutics by Goodman & Gilman (reference)

**Evaluation**

Internal Assessment – 3 sessional examinations

One exam for theory at the end of each semester

The last sessional exam will be model examination (as per University pattern) – theory, Practical and viva voce

Internal assessment for theory = 15 marks

Internal Assessment is calculated with following break up

Final theory -Paper I and Paper II = 80 marks

Seminar presentation and post-test = 20 marks

Project = 10 marks

Viva voce = 20 marks

Best of first two theory exams out of (n-1) = 20 marks

Total = 150 marks

Internal assessment for theory =  $150 / 10 = 15$  marks

Internal assessment for practicals = 15 marks

Record = 5 marks

Practicals = 25marks

Total  $25+5= 30/ 2= 15$  marks

University examinations marks break up are

Theory -two papers of 40 marks each - 80 marks

Practical - 25 marks

Viva voce - 15 marks

Internal assessment

(Theory-15; practical 15) - 30 marks

Total - 150 marks

Pattern of Theory paper for final sessional exam and university exam

There will be 2 papers of 40 marks each. No division of question papers into section A and section B

Duration is 2 hours/ paper

Paper I

(Topics: General Pharmacology, ANS, CVS, blood, diuretics, CNS, autacoids, Respiratory System)

- I. Clinical Problem (1) = 5 marks
- II. Structured essay questions (1) = 5 marks
- III. Short notes (4 x 3 = 12 marks)
- IV. Give reasons for the following (5 x 1 = 5)
- V. Give two uses and two adverse effects specific to the drug (4 x 1 = 4)
- VI. Choose the drug and justify (5 x 1 = 5)
- VII. Name two drugs ( $\frac{1}{2} \times 8 = 4$ )

Paper II

(Topics: GIT, Hormones, antibiotics, chemotherapy and miscellaneous)

- I. Clinical problem (1) = 5 marks
- II. Structured essay questions (1) = 5 marks
- III. Short notes (4 x 3 = 12 marks)
- IV. Give reasons for the following (5 x 1 = 5)
- V. Specify the mechanism of action of the following drugs (3 x 1 = 3)
- VI. Specify the spectrum (highly susceptible organism) for the following agents (2 x 1 = 2)
- VII. Give two uses and two adverse effects specific to the drug (4 x 1 = 4)
- VIII. Name two drugs ( $\frac{1}{2} \times 8 = 4$ )

Practicals

Total marks = 25 marks

Practical I - Objective Structured Practical Examination (OSPE)

Response stations - 10

Time at each station is 5 minutes.

1. Prescription writing for prescription for common ailments - 1 = 2 marks
2. Prescription for special groups – pregnant woman, children, elderly and patients with renal or hepatic disease) - 1 = 2 marks
3. Exercise on Drug interaction – 1 = 2 marks
4. Drug dosage calculation - 1 = 1 mark
5. Dosage forms - 1 = 1 mark
6. Drugs - 3 nos from different: groups = 3 marks
7. Device - 1 = 1 mark
8. Diagram/Picture of plants or ADR - 1 = 1 mark
9. Calculation of percentage solutions (normal saline, 5% dextrose/half normal saline/others) /ORS procedure) - 1 = 1 mark
10. Sources of drug information – 1 = 1 mark

Total = 15 marks

Practical II- (Interactive sessions)

1. Clinical Pharmacology chart – 1 = 2 marks
2. Interpretation of experimental chart -1 = 3 marks
3. Interpretation of data (providing lab: reports) -1 = 1 mark
4. Criticize and rewrite informed consent form – 1 = 3 marks
5. ADR (clinical problem) -1 = 1 mark

OR

6. Give an irrational prescription with wrong dosage, wrong route, wrong frequency and inadequate supportive drugs. Exercise to correct the mistakes and form a rational prescription-1=3marks

OR

7. Demonstrate route of administration (loading syringe, cleaning, different routes IM.IV.SC etc) or demonstrate use of Inhaler or use of eye drops, OC etc)
- 1= 3 marks

Total = 10marks

**VIVA VOCE**

Total 4 stations each student to be examined by all the four examiners Total 15 marks

**COMMUNITY MEDICINE****A. VISION**

To develop a group of medical graduate who will be proactive in identifying and responding to public health challenges the society is facing.

**B. MISSION**

To bring out a group of Medical Graduates who can practice the science of medicine with Social responsibility and social accountability and provide cost effective, value based comprehensive health care.

**C. GOAL**

To equip the students to function efficiently and effectively as first level physicians in the community in accordance with the committed vision and mission of community medicine.

**D. DEPARTMENTAL OBJECTIVES****D.1. GENERAL OBJECTIVE**

To train Medical Students with knowledge, attitude and skills required to become doctors with empathy, and, who can effectively function as healthcare providers, decision makers, communicators, community leaders and managers in rural and urban settings.

**D.2. SPECIFIC OBJECTIVES****D.2.1. KNOWLEDGE**

1. To identify the multi-factorial determinants & dimensions of health and disease, dynamics of community behaviours and human society
2. To understand the structure and process of the health care delivery system