Marwadi University
Faculty of Pharmacy

Subject code: **13PH0602**
Subject name: **Pharmacology-III**

Scope: This subject is intended to impart the fundamental knowledge on various aspects (classification, mechanism of action, therapeutic effects, clinical uses, side effects, and contraindications) of drugs acting on the respiratory and gastrointestinal system, infectious diseases, immuno-pharmacology and also, emphasis on the principles of toxicology and chrono-pharmacology.

Objective: Upon completion of this course the student should be able to:
1. Understand the mechanism of drug action and its relevance in the treatment of different infectious diseases.
2. Comprehend the principles of toxicology and treatment of various poisonings.
3. Appreciate the correlation of pharmacology with related medical sciences.

Teaching and assessment scheme:

Teaching Scheme (Hours)			Credits	Theory/ Tutorial Marks			Practical Marks		Total Marks
Theory	Tutorial	Practical		CSE	IA (I)	ESE (E)	TW	Viva (V)	
3	1	4	6	10	15	75	15	35	150

Theory syllabus: **Teaching hours: 45 Hours**

Unit-1 **10 Hours**

Pharmacology of drugs acting on the respiratory system:
a. Anti-asthmatic drugs.
b. Drugs used in the management of COPD.
c. Expectorants and antitussives.
d. Nasal decongestants.
e. Respiratory stimulants.

Pharmacology of drugs acting on the Gastrointestinal Tract.
a. Antiulcer agents.
b. Drugs for constipation and diarrhoea.
c. Appetite stimulants and suppressants.
d. Digestants and carminatives.
e. Emetics and anti-emetics.

Unit-2 **10 Hours**

Chemotherapy:
a. General principles of chemotherapy.
b. Sulfonamides and cotrimoxazole.
c. Antibiotics: Penicillins, cephalosporins, chloramphenicol, macrolides, quinolones, and fluoroquinolones, tetracycline, and aminoglycosides.

Unit-3 **10 Hours**

Chemotherapy:
a. Antitubercular agents.
b. Antileprotic agents.
c. Antifungal agents.

d. Antiviral drugs.
e. Anthelmintics.
f. Antimalarial drugs.
g. Antiamoebic agents.

Unit-4 — 8 Hours

Chemotherapy:

Urinary tract infections and sexually transmitted diseases, Chemotherapy of malignancy.

a. Immunopharmacology: Immunostimulants, Immunosuppressant.
b. Protein drugs, monoclonal antibodies, target drugs to antigen, biosimilars.

Unit-5 — 7 Hours

Principles of toxicology

a. Definition and basic knowledge of acute, subacute, and chronic toxicity.
b. Definition and basic knowledge of genotoxicity, carcinogenicity, teratogenicity, and mutagenicity.
c. General principles of treatment of poisoning.
d. Clinical symptoms and management of barbiturates, morphine, organo-phosphosphorus compound and lead, mercury, and arsenic poisoning.
e. Chronopharmacology: Definition of rhythm and cycles. Biological clock and their significance leading to chronotherapy.

Tutorials will be based on the above syllabus. **Teaching hours: 15 Hours**

Practical syllabus: **Teaching hours: 04 Hours/week**

1. Dose calculation in pharmacological experiments.
2. Antiallergic activity by mast cell stabilization assay.
3. Study of anti-ulcer activity of a drug-using pylorus ligand (SHAY) rat model and NSAIDS induced ulcer model.
4. Study of the effect of drugs on gastrointestinal motility.
5. Effect of agonists and antagonists on guinea-pig ileum.
6. Estimation of serum biochemical parameters by using semi-autoanalyzer.
7. Effect of saline purgative on frog intestine.
8. Insulin hypoglycemic effect in a rabbit.
9. Test for pyrogens (Rabbit method).
10. Determination of acute oral toxicity (LD50) of a drug from a given data.
11. Determination of acute skin irritation/corrosion of a test substance.
12. Determination of acute eye irritation/corrosion of a test substance.
13. Calculation of pharmacokinetic parameters from a given data.
14. Biostatistics methods in experimental pharmacology (student's t-test, ANOVA).
15. Biostatistics methods in experimental pharmacology (Chi-square test, Wilcoxon Signed Rank Test).

**Experiments are demonstrated by simulated experiments/videos.*

Recommended References (Latest edition):

1. Rang H. P., Dale M. M., Ritter J. M., Flower R. J., Rang and Dale's Pharmacology, Churchill Livingstone Elsevier.
2. Katzung B. G., Masters S. B., Trevor A. J., Basic and clinical pharmacology, Tata Mc Graw-Hill.
3. Goodman and Gilman's, The Pharmacological Basis of Therapeutics.

4. Marry Anne K. K., Lloyd Yee Y., Brian K. A., Robbin L.C., Joseph G. B., Wayne A. K., Bradley R.W., Applied Therapeutics, The Clinical Use of Drugs. The Point Lippincott Williams & Wilkins.
5. Mycek M. J, Gelnet S. B, and Perper M.M. Lippincott's Illustrated Reviews-Pharmacology.
6. K. D. Tripathi. Essentials of Medical Pharmacology, JAYPEE Brothers Medical Publishers(P) Ltd, New Delhi.
7. Sharma H. L., Sharma K. K., Principles of Pharmacology, Paras medical publisher.
8. Modern Pharmacology with Clinical Applications, by Charles R. Craig & Robert, Ghosh MN. Fundamentals of Experimental Pharmacology. Hilton & Company, Kolkata.
9. Kulkarni SK. Handbook of experimental pharmacology. Vallabh Prakashan.
10. N. Udupa and P.D. Gupta, Concepts in Chronopharmacology.