

(B. Pharm)
(Semester - IV)

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Course Code	BP404T
Course Title	Pharmacology I – Theory

Scope:

The main purpose of the subject is to understand what drugs do to the living organisms and how their effects can be applied to therapeutics. The subject covers the information about the drugs like, mechanism of action, physiological and biochemical effects (pharmacodynamics) as well as absorption, distribution, metabolism and excretion (pharmacokinetics) along with the adverse effects, clinical uses, interactions, doses, contraindications and routes of administration of different classes of drugs.

Objectives:

Upon completion of this course the student should be able to -

1. Understand the pharmacological actions of different categories of drugs.
2. Explain the mechanism of drug action at organ system/sub cellular/macromolecular levels.
3. Apply the basic pharmacological knowledge in the prevention and treatment of various diseases.
4. Observe the effect of drugs on animals by simulated experiments.
5. Appreciate correlation of pharmacology with other bio medical sciences.

Course Learning Outcomes (CLO):

At the end of the course, students will be able to -

1. Understand general concepts of pharmacology, adverse drug reactions, drug interactions, drug discovery and clinical evaluation of drugs.
2. Relate pharmacodynamics principles of drugs with mechanism of action.
3. Describe pharmacokinetics of drugs with respect to absorption, distribution, metabolism and elimination.
4. Discuss pharmacology of drugs acting on peripheral nervous system.
5. Explain pharmacology of drugs acting on central nervous system.
6. Apply their skills of handling of instruments, animals and softwares for studying pharmacological effects of the drugs.

Syllabus:

Teaching hours: 45 Hours

UNIT I

08 Hours

General Pharmacology:

Introduction to Pharmacology- Definition, historical landmarks and scope of pharmacology, nature and source of drugs, essential drugs concept and routes of drug administration, Agonists,

antagonists (competitive and non-competitive), spare receptors, addiction, tolerance, dependence, tachyphylaxis, idiosyncrasy, allergy.

Pharmacokinetics- Membrane transport, absorption, distribution, metabolism and excretion of drugs. Enzyme induction, enzyme inhibition, kinetics of elimination.

UNIT II

12 Hours

General Pharmacology:

Pharmacodynamics- Principles and mechanisms of drug action. Receptor theories and classification of receptors, regulation of receptors, drug receptors interactions, signal transduction mechanisms, G-protein-coupled receptors, ion channel receptor, transmembrane enzyme linked receptors, transmembrane JAK-STAT binding receptor and receptors that regulate transcription factors, dose response relationship, therapeutic index, combined effects of drugs and factors modifying drug action.

Adverse drug reactions.

Drug interactions (pharmacokinetic and pharmacodynamic).

Drug discovery and clinical evaluation of new drugs -Drug discovery phase, preclinical evaluation phase, clinical trial phase, phases of clinical trials and pharmacovigilance.

UNIT III

10 Hours

Pharmacology of drugs acting on peripheral nervous system:

Organization and function of ANS.

Neurohumoral transmission, co-transmission and classification of neurotransmitters.

Parasympathomimetics, Parasympatholytics, Sympathomimetics, Sympatholytics.

Neuromuscular blocking agents and skeletal muscle relaxants (peripheral), ganglion stimulants and blockers.

Local anesthetic agents.

Drugs used in myasthenia gravis and glaucoma.

UNIT IV

08 Hours

Pharmacology of drugs acting on central nervous system:

Neurohumoral transmission in the CNS. Special emphasis on importance of various neurotransmitters like with GABA, Glutamate, Glycine, serotonin, dopamine.

General anesthetics and pre-anesthetics.

Sedatives, hypnotics and centrally acting muscle relaxants.

Anti-epileptics.

Alcohol and disulfiram.

UNIT V

07 Hours

Pharmacology of drugs acting on central nervous system:

Psychopharmacological agents: Antipsychotics, antidepressants, anti-anxiety agents, anti-manics and hallucinogens.

Drugs used in Parkinson's disease and Alzheimer's disease.

CNS stimulants and nootropics.

Opioid analgesics and antagonists.

Drug addiction, drug abuse, tolerance and dependence.

Tutorials

Teaching hours: 15 Hours

Tutorials will be based on above syllabus

Suggested Readings[^]: (Latest Edition)

1. Rang H. P., Dale M. M., Ritter J. M., Flower R. J., Rang and Dale's Pharmacology. New York, Churchill Livingstone Elsevier
2. Katzung B. G., Masters S. B., Trevor A. J., Basic and Clinical Pharmacology. New Delhi, Tata Mc Graw-Hill
3. Brunton L., Chabner B.A., Knollman B. Goodman and Gillman's The Pharmacological Basis of Therapeutics. USA, McGraw Hill Education.
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. USA, The Point Lippincott Williams & Wilkins
5. Harvey R.A., Clark M.A., Finkel R., Rey J.A., Whalen K. Pharmacology (Lippincott's Illustrated Reviews). New Jersey, Lippincott Williams and Wilkins
6. Tripathi K.D. Essentials of Medical Pharmacology. New Delhi, Jaypee Brothers Medical Publishers (P) Ltd.
7. Sharma H. L., Sharma K. K. Principles of Pharmacology. New Delhi, Paras Medical Publisher
8. Craig C.R. Stitzel R. E. Modern Pharmacology with Clinical Applications. Lippincott Williams & Wilkins
9. Ghosh MN. Fundamentals of Experimental Pharmacology. Kolkata. Hilton & Company.
10. Kulkarni SK. Handbook of Experimental Pharmacology. New Delhi. Vallabh Prakashan
11. Goyal R.K., Mehta A.A., Balaraman R., Burande M.D. Dearsari and Gandhi's Elements of Pharmacology. Ahmedabad, B.S. Shah Prakashan.

L= Lecture, T= Tutorial, P= Practical, C= Credit

[^] this is not an exhaustive list
