

Systemic Pharmacology I

BP405T

For B.Pharm II year students

As per the new Pharmacy Council of India (PCI) Syllabus 2026 (NEP 2020)

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Preface

Systemic Pharmacology is an essential part of pharmaceutical education, providing students with a clear understanding of how drugs interact with different organ systems to produce therapeutic effects. Systemic Pharmacology I has been designed to introduce B.Pharm students to the principles of drug action and their application in the prevention and treatment of diseases affecting major body systems. This book is prepared in accordance with the New PCI Syllabus 2026 (NEP 2020) and is intended primarily for B.Pharm II Year students.

The content has been organized systematically to help students understand the pharmacological actions, mechanisms of action, therapeutic uses, adverse effects, and important drug interactions of commonly used medicines.

Particular emphasis has been placed on presenting pharmacological concepts in a simple, clear, and student-friendly manner. Wherever appropriate, tables, classifications, flowcharts, and concise explanations have been incorporated to facilitate quick understanding, revision, and examination preparation. The book also aims to help students develop a foundation for relating the mechanism of drug action to its clinical application.

We have made every effort to ensure that the information presented is accurate, relevant, and aligned with the prescribed curriculum. However, pharmacology is a continually evolving discipline, and readers are encouraged to consult standard references and current authoritative sources for detailed and updated information.

We sincerely hope that Systemic Pharmacology I will serve as a useful companion for students in their academic journey and help them develop a strong foundation in pharmacology and its practical application in pharmacy practice.

Authors

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Course Objectives

The objectives of this course are to:

1. Develop a comprehensive understanding of neurohumoral transmission, neurotransmitters, and the organization and function of the autonomic nervous system.
2. Provide knowledge of the classification, mechanisms of action, and pharmacological effects of various classes of drugs.
3. Explain the pharmacology of drugs acting on the peripheral nervous system, cardiovascular system, and urinary system.
4. Describe the physiological roles of autacoids and the pharmacology of drugs used in the management of pulmonary diseases and related disorders.
5. Familiarize students with the pharmacology of drugs acting on the immune system, hematopoietic system, and blood, and relate pharmacological principles to clinical conditions through case-based learning.

Course Outcomes

Upon successful completion of this course, the students will be able to:

1. Explain the classification of neurotransmitters and describe neurohumoral transmission, including the organization, function, and pharmacological modulation of the autonomic nervous system.
2. Classify and explain the mechanisms of action, pharmacological effects, and therapeutic uses of drugs used in cardiovascular disorders such as heart failure, arrhythmias, hypertension, angina, and lipid disorders.
3. Describe the pharmacology and therapeutic uses of drugs acting on blood and kidney, including anticoagulants, antiplatelet agents, hematinics, and diuretics.
4. Explain the physiological roles of autacoids and analyze the pharmacology of drugs that modulate autacoid pathways, including antihistamines, antimigraine agents, NSAIDs, and antirheumatic drugs.
5. Evaluate the mechanisms of action, therapeutic uses, and adverse effects of drugs acting on the respiratory and immune systems.

Syllabus

Unit	Topics	No. of lectures
I	Pharmacology of drugs acting on the peripheral nervous system a) Organization and functions of PNS. b) Neurohumoral transmission, co-transmission. Neurotransmitters and their receptors, including non-adrenergic and non-cholinergic (NANC) neurotransmitters. c) Parasympathomimetic and Parasympatholytic drugs. d) Sympathomimetic and sympatholytic drugs. e) Skeletal muscle relaxants (peripheral and central). f) Drugs used in the treatment of myasthenia gravis and glaucoma	10 Hours
II	Pharmacology of drugs acting on the cardiovascular system a) Introduction to cardiovascular hemodynamic and cardiac electrophysiology. b) Drugs used in congestive cardiac failure. c) Anti-arrhythmic drugs. d) Anti-anginal and newer anti-ischemic drugs. e) Anti-hypertensive drugs. f) Shock, types of shocks and drugs used in their management. g) Stroke, types of strokes and drugs used in their management	10 Hours
III	Pharmacology of drugs acting on blood and kidney 1. Pharmacology of drugs acting on blood a) Anti-platelet agents b) Coagulants and anticoagulants. c) Fibrinolytics and Plasma expanders. d) Haematinics. e) Anti-hyperlipidaemic drugs. 2. Pharmacology of drugs acting on kidney a) Diuretics. b) Anti-diuretics.	10 Hours
IV	Pharmacology of autacoids and related drugs a) Introduction to autacoids and their classification. Therapeutic significance of important agonists and antagonists of prostaglandins, thromboxane, leukotrienes, angiotensin, bradykinin and substance P. b) Histamine and antihistamines. c) 5-HT, its agonists and antagonists, drugs used in migraine. d) Non-steroidal anti-inflammatory drugs, antipyretics and analgesics. e) Anti-gout and Antirheumatic drugs including Disease Modifying Antirheumatic Drugs (DMARDs).	9 Hours
V	i) Pharmacology of Drugs acting on respiratory system a) Drugs used in the treatment of bronchial asthma and COPD. b) Definitions, classification and therapeutic uses of nasal decongestants, mucolytics, expectorants and antitussives. c) Respiratory stimulants. ii) Pharmacology of Drugs acting on immune system Mechanism of action, adverse effects and therapeutic uses of important classes of immune stimulants and immunosuppressants.	6 Hours

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