Lecture Plan

Name of the college: Government College of Arts, Science & Commerce, Sanquelim, Goa		
Name of Faculty: Dr. Dipesh Sakharam Harmalkar	**Subject: Pharmaceutical Chemistry**	
Paper code: CHC-205	**Program/Course: S.Y.BSc.**	**Division:**
Academic year: 2025 - 2026	**Semester: IV**	**Total Lectures: 30**
Credits: 2		

Course Objectives:

- To understand the terminologies in pharmaceutical chemistry.
- To study the structures of selected drugs.
- To understand the IUPAC nomenclature of drugs.
- To predict the mechanism of action and SAR analysis of drugs.

Expected Course Outcome:

At the end of the course students will be able to:

CO1-Explain and define basic concepts, terminology, classifications, and representative drugs in pharmaceutical chemistry.

CO2-Understand the basic concepts of pharmaceutical chemistry, including drug classification, synthesis, mechanism of action, and structure–activity relationship of selected drugs.

CO3-Apply the fundamental principles of pharmaceutical chemistry to correlate drug structure with its pharmacological activity, explain mechanisms of action, and synthesize commonly used drugs to understand their therapeutic applications and physiological effects.

CO4-Analyze the chemical structure, synthesis pathway, and pharmacological activity of different classes of drugs to correlate their structure–activity relationship (SAR) and mechanism of action in therapeutic applications.

Learning Outcome:

At the end of the course students will be able to:

1. Define and explain the fundamental concepts and terminology of pharmaceutical chemistry, describe the various classifications of drugs, and identify representative examples from each category.
2. Demonstrate an understanding of drug classification, methods of synthesis, mechanisms of drug action, and the basics of structure–activity relationships (SAR) for selected therapeutic agents.

3. Apply core principles of pharmaceutical chemistry to correlate drug structures with their pharmacological activities, explain their mechanisms of action, and outline synthetic pathways of commonly used drugs to understand their therapeutic and physiological roles.
4. Critically analyze the chemical structures, synthetic routes, pharmacological actions, and SAR of different drug classes to understand how structural variations influence therapeutic effectiveness and mechanism of action.

Month	Lectures From	Lectures To	No. of lectures allotted	Topic, Subtopic to be covered	Exercise/Assignment	ICT Tools	Reference books
December	01-12-2025	23-12-2025	06	**1. Introduction to Pharmaceutical Chemistry:** Why the need to study pharmaceutical chemistry? Importance of chemistry in pharmacy. Definitions of Pharmaceutical Chemistry, Pharmacophore, Pharmacognosy, Pharmacokinetics, Classifications of drugs based on their uses, definition, giving one example with structure: Anti infective agents: Antibacterial (Sulphaacetamide), Antifungal (Clotrimazole), Antiviral (Sulphaacetamide),		Smart board, Power point presentation, Google classroom.	[1-7]
January	01-01-2026	16-01-2026	04	**1. Introduction to Pharmaceutical Chemistry:** Antifungal (Clotrimazole), Antiviral (Amantadine HCl), Anthelmintics (Mebendazole), Antiamoebic Metronidazole), Antimalarial (Chloroquine), Antitubercular (Isoniazid), Antihypertensive (Methyl Dopa), Anticoagulant (Warfarin), Diuretics (Acetazolamide), Analgesic (Paracetamol), NSAIDs (Ibuprofen), Local Anaesthetic (Benzocaine), antibiotics (Chloramphenicol), Central nervous depressant (phenobarbital), Anticonvulsant (Phenytoin).	ISA I: Assignment	Smart board, Power point presentation, Google classroom, Google quiz	[1-7]
	17-01-2026	31-01-2026	05	**2. IUPAC names, Synthesis and uses of following drugs:** Synthesis of Aspirin, paracetamol, Ibuprofen, Sulphacetamide, Amantadine HCl, Clotrimazole,			

Februar y	01-02-2026	05-02-2026	01	**2. IUPAC names, Synthesis and uses of following drugs:** Phenobarbital, Glyceryl trinitrate, Dapsone, metronidazole.	ISA II: Written test	Smart board, Power point presentation, Google classroom, Google quiz	[1-7]
	06-02-2026	28-02-2026	07	**3. Mechanism of Action of representative drugs:** Analgesic and Anti-inflammatory drugs (Ibuprofen), Antilepral agent (Dapsone), Sulphonamides, antiamoebic metronidazole), Central nervous depressant (Phenobarbital) , Antimalarial (Chloroquine).		Smart board, Power point presentation, Google classroom, Google quiz	
March	01-03-2026	31-03-2026	08	**4. Structure Activity Relationship of representative drugs:** Effect of functional groups on physiological activity of drugs: hydroxy, acidic, alkyl, aldehyde, ketone, cyano, halogens, ether and ester groups with one example each Analgesic and Anti-inflammatory drugs (Ibuprofen), Antilepral agent (Dapsone), Sulphonamides (sulphacetamide), antiamoebic (metronidazole), Central nervous depressant (Phenobarbital)	ISA III: Quiz	Smart board, Power point presentation, Google classroom	[1-7]

References:

1. Patrick, G. L., Introduction to Medicinal Chemistry, 7 th edn., Oxford Readings, University Press, UK, 2023.
2. Singh, H. and Kapoor, V.K. Singh, H. and Kapoor, V.K. Medicinal and Pharmaceutical Chemistry, 3rd edn., Vallabh Prakashan, Pitampura, New Delhi, 2012 edn., Vallabh Prakashan, Pitampura, New Delhi, 2012.
3. Foye, W.O. Lemke, T.L. William, D.A., Foye, W.O. Lemke, T.L. William, D.A., Principles of Medicinal Chemistry, 7 th edn., B. I. Waverly Pvt. Ltd., New Delhi, 2012. edn.
4. Beale, J. H. and Blocks, J. H., Beale, J. H. and Blocks, J. H., Wilson and Gisvold's Textbook of Organic, Medicinal and Pharmaceutical Chemistry, 12th edn., Lippinkott Williams and Wilkins, Philadelphia, USA, 2011.
5. Lednicer, D. and Meischer, L.A., Organic Chemistry of Drug Synthesis Vol. I to III. John Wiley & Sons, New Jersey, USA, 2005.
6. Sriram, D. and Yogeshwari, P., Medicinal Chemistry 1st edn., Pearson Education, London, 2007.
7. Wolff, M. E., Medicinal Chemistry and Drug Discovery, 5th edn., edn. John Wiley & Sons, New Jersey, USA, 1997.

* Assessment Rubrics	
Component	**Max Marks**
ISA	10
Semester End Exam	40