

Lecture Plan

Name of the college: Government College of Arts, Science & Commerce, Sankhali, Goa		
Name of Faculty: Dr. Dipesh Sakharam Harmalkar	Subject: Drug Synthesis and Analysis	
Paper code: CHC-243	Program/Course: S.Y.BSc.	Division:
Academic year: 2025 - 2026	Semester: III	Total Lectures: 15
Credits: 1		
Course Objectives: • To understand the retrosynthetic approach for synthesis of selected drugs. • To understand purity analysis of drugs.		
Expected Course Outcome: At the end of the course students will be able to: CO1: Explain the drug synthesis, classifications, and examples of commonly used drugs. CO2: Describe the basic concepts of drug synthesis and analysis, including drug types, interactions, synthesis of selected drugs, and principles of chemical and biological assays. CO3: Apply synthetic knowledge for drug synthesis, retrosynthesis, interpret interactions, and identify basic assays. CO4: Analyze the structural features, classification and synthesis strategies of selected drugs, and to distinguish drug types and assay methods.		
Learning Outcome: At the end of the course students will be able to: LO1: explain the process of drug synthesis, classify drugs based on their origin, and provide examples of commonly used drugs. LO2: describe fundamental concepts related to drug synthesis and analysis, including drug types, drug-receptor interactions, selected drug syntheses, and the principles of chemical and biological assays. LO3: apply synthetic knowledge for drug synthesis and retrosynthesis, to interpret drug interactions and identify appropriate assay techniques. LO4: analyze the structural features, classification and synthesis strategies of selected drugs, to differentiate drug types and compare assay methods.		

Month	Lectures From	Lectures To	No. of lectures allotted	Topic, Subtopic to be covered	Exercise /Assignment	ICT Tools	Reference books
June	20-06-2025	30-06-2025	01	1. Drug Synthesis: Drug: Definition. Drug-Receptor interaction, Pharmacophore, Toxicophore, Metabiophore.		Smart board, Power point presentation, Google classroom	[1-4]
July	01-07-2025	31-07-2025	04	1. Drug Synthesis: Classification of natural, semi-synthetic and synthetic drugs with two examples of each. Synthesis, drug class, use and side-effects of Aspirin, Benzocaine, Niclosamide, Dilantin, Ibuprofen. Aspirin, Benzocaine, Niclosamide, Dilantin, Ibuprofen. Retrosynthetic approach-(Ibuprofen).		Smart board, Power point presentation, Google classroom	[1-4]
August	01-08-2025	23-08-2025	03	1. Drug Synthesis: Synthesis, drug class, use and side-effects Niclosamide, Dilantin, Ibuprofen. Retrosynthetic approach-(Ibuprofen).	ISA I	Smart board, Power point presentation, Google classroom	[1-4]
August	24-08-2025	31-08-2025	02	2. Analysis of Drugs: Introduction to Assay, Potency, Types of Assay, Chemical Assay-Functional groups.		Smart board, Power point presentation, Google classroom	[1-4]
September	01-09-2025	30-09-2025	03	2. Analysis of Drugs: Titrimetric (Aspirin) and Instrumental (Paracetamol) assay-Advantages and Disadvantages. Introduction to Bioassay-Principle, types of bioassay.	ISA II	Smart board, Power point presentation, Google classroom	[1-4]
October	01-10-2025	18-10-2025	03	2. Analysis of Drugs: Differences between In vitro and In vivo assay. Comparison between Chemical assay and Bioassay.	ISA III	Smart board, Power point presentation, Google classroom	[1-4]

References:

- [1] Foye, W.O.; Lemke, T.L.; William, D.A., Principles of Medicinal Chemistry, 7th ed., B.I. Waverly Pvt. Ltd. New Delhi, 2012.
- [2] Patrick, G.L., Introduction to Medicinal Chemistry, 7th ed., Oxford University Press, UK, 2023.
- [3] Chatwal, G.R., Medicinal Chemistry, 2nd ed., Himalaya Publishing house, India, 2002.
- [4] Chatwal, G.R., Synthetic drugs, 2nd ed., Himalaya Publishing house, India, 1996.

* Assessment Rubrics	
Component	Max Marks
ISA	15
Practical	25
Semester End Exam	60