

Lecture Plan

Name of the college: Government College of Arts, Science & Commerce, Sanquelim, Goa		
Name of Faculty: Dr. Dipesh Sakharam Harmalkar	Subject: Pharmaceutical Chemistry and Analysis	
Paper code: CHD-106	Program/Course: T.Y.BSc.	Division:
Academic year: 2024 - 2025	Semester: VI	Total Lectures: 30
Credits: 4		
Course Objectives: <ul style="list-style-type: none">• Pharmaceutical inorganic compounds.• Structure, synthesis and use of some selected drugs.• Current good manufacturing practices.• Radiopharmaceuticals, medicinal chemistry of herbs and Pharmaceutical unit processes		
Expected Course Outcome: <p>At the end of the course students will be able to:</p> <p>CO1: Demonstrate an understanding of the properties, roles, and applications of pharmaceutical inorganic compounds in drug formulation and healthcare.</p> <p>CO2: Analyze the structure, synthesis, and therapeutic applications of selected drugs, highlighting their mechanism of action and pharmacological importance.</p> <p>CO3: Apply the principles of current good manufacturing practices (cGMP) to ensure quality control and compliance in pharmaceutical production.</p> <p>CO4: Explore the use of radiopharmaceuticals, the medicinal chemistry of herbs, and the principles of pharmaceutical unit processes to advance drug development and patient care.</p>		
Learning Outcome: <p>At the end of the course students will be able to:</p> <ol style="list-style-type: none">1. synthesize important drugs.2. learn about the good manufacturing practice in pharmaceutical industry before they start working in the same.3. learn about radioactive compounds used in therapy.4. learn about the organic compounds present in herbs and their therapeutic effect.5. handle unit processes called out in pharmaceutical industry.		

Month	Lectures From	Lectures To	No. of lectures allotted	Topic, Subtopic to be covered	Exercise/Assignment	ICT Tools	Reference books
December	09-12-2024	31-12-2024	02	1. Pharmaceutical Inorganic compounds: Pure chemical compound, sources of impurities		Smart board, Power point presentation, Google classroom.	[1-3]
January	02-01-2025	10-01-2025	03	1. Pharmaceutical Inorganic compounds: Limit tests for chloride and sulphate. Official compounds of Iron: Ferrous Fumarate and Ferrous Gluconate, Official compounds of Iodine: Tincture of Iodine, Aqueous Iodine solution. Official compounds of Calcium: Calcium Gluconate, Calcium acetate.		Smart board, Power point presentation, Google classroom, Google quiz	[1-3]
	10-01-2025	25-01-2025	05	2. Structure, Synthesis and use of Selected Drugs: Benzocaine, Pyrazinamide, Mefenamic acid, Naproxen, Phenobarbital, Atenolol and Theophylline.		Smart board, Power point presentation, Google classroom	[1-3]
	25-01-2025	31-01-2025	01	3. Current Good Manufacturing Practice: Standards for Current Good Manufacturing Practice,	ISA I: Assignment	Smart board, Power point presentation, Google classroom	[1-3]
February	01-02-2025	14-02-2025	04	3. Current Good Manufacturing Practice: CGMP for Finished Pharmaceuticals: General Provisions, Organization and Personnel, Buildings and facilities, Equipments, Controls of components containers and closures, Production and process control, packaging and labelling control, holding and distribution, laboratory controls, records and reports, returned and salvaged drug products, Information technology and automation.		Smart board, Power point presentation, Google classroom, Google quiz	[1-3]

	15-02-2025	28-02-2025	04	4. Radiopharmaceuticals: Introduction, Isotopes and Radioisotopes, Radiochemistry of Fluorine, Indium and Iodine.	ISA II: Written test		[1-3]
March	01-03-2025	01-03-2025	01	4. Radiopharmaceuticals: Indium and Iodine.		Smart board, Power point presentation, Google classroom	[1-3]
	07-03-2025	21-03-2025	05	5. Medicinal Chemistry of Herbs: Structure and name of an active component and its uses. Garlic (Allicin), Capsicum (Capsaicin), Chamomile (-)-alpha-Bisabolol, Tulsi (Eugenol, Methyl Eugenol), Turmeric (Curcumin), Adulsa (Vasicinone), Coriander (Coriandrol), Ajwain (Thymol), Aloes (Aloesin) and Gokhru (Harman). Extraction of Clove oil and Cinnamon oil.		Smart board, Power point presentation, Google classroom	[1-3]
	22-03-2025	31-03-2025	03	6. Pharmaceutical unit processes: a. Nitration: Importance of Nitro group in Medicines. Introduction, Nitrating agents, Aromatic nitration, Kinetics and mechanism of Aromatic nitration, Industrial Nitration process: continuous nitration of benzene with HNO ₃ - fortified spent acid	ISA III: Quiz	Smart board, Power point presentation, Google classroom	[1-3]
April	01-04-2025	11-04-2025	03	6. Pharmaceutical unit processes: b. Halogenation: Importance of halogenated compounds in drugs, Introduction, Chlorination of propane. c. Fermentation: Aerobic and anaerobic fermentation. Production of Penicillin Vitamin B12.		Smart board, Power point presentation, Google classroom	[1-3]

References:

1. G. R. Chatwal Pharmaceutical Chemistry-Inorganic, Himalaya Publications.
2. Ashutosh Kar, Medicinal Chemistry, Newage International Publishers.

3. Wilson and Gisvold's textbook of Organic Medicinal and Pharmaceutical chemistry, Twelfth Edition, Wolters Kluwer

* Assessment Rubrics	
Component	Max Marks
ISA	20
Semester End Exam	80