THIRD-YEAR OF BACHELOR OF SCIENCE CHEMISTRY (MAJOR) REVISED SYLLABUS ACCORDING TO CBCS NEP2020

COURSE TITLE: DRUG CHEMISTRY-I

SEMESTER-V

W.E.F. 2025-2026

RECOMMENDED BY THE BOARD OF STUDIES IN CHEMISTRY
AND
APPROVED BY THE ACADEMIC COUNCIL

Devrukh Shikshan Prasarak Mandal's
Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh.
Tal. Sangameshwar, Dist. Ratnagiri-415804, Maharashtra, India

Academic Council Item No: 02/2025

Name of the Implementing Institute	:	Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh. Tal. Sangameshwar, Dist. Ratnagiri-415804,
Name of the Parent University	:	University of Mumbai
Name of the Programme	:	Bachelor of Science
Name of the Department	:	Chemistry
Name of the Class	:	Third Year
Semester	:	Fifth (V)
No. of Credits	:	02
Title of the Course	:	Drug Chemistry-I
Course Code	:	CHVS301
Name of the Vertical in adherence to NEP 2020	:	Vocational Skill Course (VSC)
Eligibility for Admission	:	Any student admitted to Third Year of B.Sc. Degree Programme in adherence to Rules and Regulations of the University of Mumbai and Government of Maharashtra
Passing Marks	:	40%
Mode of Assessment	:	Summative at the end of semester
Level	:	5.5
Pattern of Marks Distribution for SEE and CIA	:	100%
Status	:	NEP-CBCS
To be implemented from Academic Year	:	2025-2026
Ordinances /Regulations (if any)		

Syllabus for Third Year of Bachelor of Science in Chemistry

(With effect from the academic year 2025-2026)

SEMESTER-V **Paper No. III**

Course Title: Drug Chemistry-I **No. of Credits - 02**

Type of Vertical: VSC **COURSE CODE: CHVS301**

Learning Outcomes Based on BLOOM's Taxonomy:

After Completing the Programme, Student will be able to,

Bloom Level	CO No.	Course Outcome
Understand	CO1	Explain the basic terms in drugs, routes of drug administration.
Understand	CO2	predict use, side-effects and synthetic routes for different pharmacodynamic agents.
Apply	CO3	estimate the concentration of drug from formulation and prepare drugs and drug intermediates.
Apply	CO4	prepare monographs of drugs by Indian Pharmacopoeia method

Syllabus for Third Year of Bachelor of Science in Chemistry

(With effect from the academic year 2025-2026)

SEMESTER-V **Paper No.– III**

Course Title: Drug Chemistry-I **No. of Credits - 02**

Type of Vertical: VSC **COURSE CODE: CHVS301**

COURSE CONTENT			
Module No.	**Content**	**Credits**	**No. of Hours**
1	**Module-1: Introduction to Drugs and Pharmacodynamic Agents (30L)** **1.1. General Introduction to Drugs (6L)** 1.1.1. Definition of a drug, sources of drugs, requirements of an ideal drug, classification of drugs (based on therapeutic action) 1.1.2. Nomenclature of drugs: Generic name, Brand name, Systematic name 1.1.3. Definition of the following medicinal terms: Pharmacon, Pharmacology, Pharmacophore, Prodrug, Half – life efficiency, LD50, ED50, GI50 Therapeutic Index, Receptors, Agonists, Antagonists, Drug-receptor interaction, Drug Potency, Bioavailability, Drug toxicity, Drug addiction, Spurious Drugs, Misbranded Drugs, Adulterated Drugs, Pharmacopoeia. **1.2. Routes of Drug Administration and Dosage Forms (4L)** 1.2.1. Oral and Parenteral routes with advantages and disadvantages. 1.2.2. Formulations & combination formulation, Different dosage forms **1.3. Pharmacodynamic agents: (20)** A brief introduction of the following pharmacodynamic agents and the study with respect to their chemical structure, chemical class, therapeutic uses, and side effects: 1.3.1. CNS Drugs: Classification based on pharmacological actions: CNS Depressants & CNS Stimulants. Concept of sedation and hypnosis, anaesthesia. Examples: Phenytoin and Trimethadione (Synthesis from acetone). 1.3.2. Analgesics, Antipyretics and Anti-inflammatory Drugs: Narcotic and Non-Narcotic Analgesics, Antipyretics - Morphine, Tramadol (Synthesis from salicylic acid), Aspirin, Paracetamol; Steroidal and Non-Steroidal Anti-inflammatory Drugs (NSAIDS)	01	30

	- Steroids: Prednisolone, Betamethasone, NSAIDS: Diclofenac, Aceclofenac (Synthesis from 2,6-dichlorodiphenyl amine). 1.3.3. Antihistaminic Drugs – Diphenhydramine, Cetirizine (Synthesis from 4-Chlorobenzhydryl chloride), Pantoprazole (Benzimidazoles) 1.3.4. Cardiovascular drugs - Classification based on pharmacological action, Atenolol (Synthesis from 3-Hydroxy phenyl acetamide) 1.3.5. Antidiabetic Agents - General idea and types of diabetes; Insulin therapy, Metformin, Pioglitazone (Synthesis from 2-(5-ethylpyridin-2-yl) ethanol) 1.3.6. Drugs for Respiratory System - Expectorants; Mucolytes; Bronchodilators; Decongestants; Antitussives - Ambroxol (Synthesis from paracetamol), Salbutamol.		
2	**Laboratory skills and Monograph preparation (30L)** 1. Estimation of Ibuprofen (back titration method) 2. Estimation of Acid neutralizing capacity of a drug 3. Preparation of Aspirin from salicylic acid. 4. Preparation of monograph of any five commonly used drugs from syllabus by I.P. method.	01	30
	Total	**02**	**60**

Access to the Course

The course is available for all the students admitted for Third Year Bachelor of Science.

Methods of Assessment

Practical courses, vocational skill courses, skill enhancement courses and the courses having laboratory sessions shall be assesses at the end of each semester.

References:

1. Foye's principles of medicinal chemistry. 6th Edition, Edited by Davis William & Thomas Lemke, Indian edition by B I Publication Pvt Ltd, Lippmcolt Williams & Wilkins.
2. Text book of organic medicinal & pharmaceutical chemistry. Wilson & Gisovolds, 11th Edition by John H Block, John M Beale Jr.
3. Medicinal chemistry. Ashutosh Kar, New Age International Pvt. Ltd Publisher. 4th edition.
4. Burger's Medicinal Chemistry, Drug Discovery and Development. Abraham and Rotella.
5. Medicinal chemistry. Ashutosh Kar, New Age International Pvt. Ltd Publisher. 4th edition.
6. Medicinal chemistry. V.K. Ahluwalia and Madhu Chopra, CRC Press.
7. Principle of medicinal chemistry. Vol 1 &2 S. S. Kadam, K. R. Mahadik, K. G. Bothara
8. The Art of Drug synthesis. Johnson and Li. Wiley, 2007.
9. The organic chemistry of drug design & drug action. 2nd ed. By Richard B Silvermann, Academic Press.