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

COURSE TITLE: **DRUG CHEMISTRY-II**

SEMESTER-VI

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	:	Sixth (VI)
No. of Credits	:	02
Title of the Course	:	Drug Chemistry-II
Course Code	:	CHVS303
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-VI **Paper No. V**

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

Type of Vertical: VSC **COURSE CODE: CHVS303**

Learning Outcomes Based on BLOOM's Taxonomy:

After Completing the Programme, Student will be able to,

Bloom Level	CO No.	Course Outcome
Understand	CO1	describe the drug discovery, design and development process
Understand	CO2	predict the uses and side-effects of drugs and pathways for their synthesis.
Analyze	CO3	analyze the amount of drug in formulation and prepare in the laboratory.
Understand	CO4	identify the functioning and work culture of pharmaceutical industry.

Syllabus for Third Year of Bachelor of Science in Chemistry

(With effect from the academic year 2025-2026)

SEMESTER-VI **Paper No.– V**

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

Type of Vertical: VSC **COURSE CODE: CHVS303**

COURSE CONTENT			
Module No.	**Content**	**Credits**	**No. of Hours**
1	**Drug Discovery, Design, Development and chemotherapeutic agents (30L)** **1.1. Development of drug (5L)** Discovery of a Lead compound: Screening, drug metabolism studies and clinical observations; The Pharmacophore identification, modification of structure or functional group; Structure activity relationship study (Sulphonamides). **1.2 Drug Metabolism (3L):** Introduction, Absorption, Distribution, Biotransformation, Excretion; Different types of chemical transformation of drugs. **1.3 Chemotherapeutic Agents (1L):** Introduction, Study of the following chemotherapeutic agents with respect to their chemical structure, chemical class, therapeutic uses and side effects. **1.3.1 Antibiotics (3L):** Definition, Classification based on therapeutic effect (Broad spectrum & Narrow spectrum) and based on structure (beta-lactum antibiotics, Cephalosporins, Tetracyclines, Quinolones with one example each), synthesis of Levofloxacin. **1.3.2. Antimalarials (2L):** Types of malaria; Symptoms; Pathological detection, Chloroquine. **1.3.3. Anthelmintics and Antifungal agents (2L):** Drugs effective in the treatment of Nematodes and Cestodes infestations; Clotrimazole, Albendazole (Synthesis from 2- Nitroaniline), Fluconazole (Synthesis from 1- Bromo – 2,4-difluorobenzene). **1.3.4. Antiamoebic Drugs (2L)** Types of Amoebiasis, Metronidazole, Ornidazole, Tinidazole (Imidazole), Synthesis of Metronidazole from glyoxal by Debus-Radziszewski imidazole synthesis route.	01	30

	1.3.4. Antitubercular and Antileprotic Drugs (4L) Cause and types of Tuberculosis and Leprosy; Symptoms and diagnosis; Antibiotics used in their treatment: Isoniazide, Ethambutol, Dapsone; Synthesis of ethambutol and Dapsone. **1.3.5. Anti-Neoplastic Drugs (2L)** Idea of malignancy; Causes of cancer, Brief idea of Immuno Stimulants & Immuno depressants Anticancer drugs: Cisplatin, Anastrozole (Synthesis from 3,5-bis (bromomethyl) toluene), vinca alkaloids. **1.3.6. Anti-HIV Drugs (2L):** Idea of HIV pathogenicity, Symptoms of AIDS, AZT/Zidovudine, Lamivudine, DDI (Purines). **1.3.7. Drug Intermediates (4L):** Synthesis and uses of 2,3,6-Triamino-6-hydroxypyrimidine from Guanidine; p-[2'-(5-Chloro-2-methoxybenzamido)ethyl]-benzenesulphonamide from Methyl-5-chloro-2-methoxybenzene; 3-(p-Chlorophenyl)-3-hydroxypiperidine from 3-Chloroacetophenone; p-Acetyl amino benzenesulphonyl chloride from Aniline; Epichlorohydrin from propene.		
2	**Laboratory skills and Industrial visit (30L)** 1. Preparation of Paracetamol form p-aminophenol. 2. O-Methylation of β-naphthol. 3. Determine the amount of ascorbic acid in a given tablet by lodometrycally. 4. Drawing structures and reaction using chem draw 5. Industrial visit to pharmaceutical industry and submission of visit report.	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.

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