



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

**COURSE TITLE: POLYMER 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	:	Polymer Chemistry-I
Course Code	:	S308CHT
Name of the Vertical in adherence to NEP 2020	:	Elective
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	:	Formative and Summative
Level	:	5.5
Pattern of Marks Distribution for SEE and CIA	:	40:60%
Status	:	NEP-CBCS
To be implemented from Academic Year	:	2025-2026
Ordinances /Regulations (if any)	:	

Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce and Vid. Dadasaheb Pitre Science College, Devrukh (An Autonomous College Affiliated with University of Mumbai)

Syllabus for Third Year of Bachelor of Science in Chemistry

(With effect from the academic year 2025-2026)

SEMESTER-V

Paper No. V

Course Title: Polymer Chemistry-I

No. of Credits - 02

Type of Vertical: Elective-II

COURSE CODE: S308CHT

Learning Outcomes Based on BLOOM's Taxonomy:

After Completing the Programme, Student will be able to,

Bloom Level	CO No.	Course Outcome
Remember	CO1	describe different types of polymers
Understand	CO2	understand the bonding in polymers and how to determine molar mass of polymers
Apply	CO3	determine the different mechanisms of polymerization

Syllabus for Third Year of Bachelor of Science in Chemistry

(With effect from the academic year 2025-2026)

SEMESTER-V

Paper No.– V

Course Title: Polymer Chemistry-I

No. of Credits - 02

Type of Vertical: Elective-II

COURSE CODE: S308CHT

COURSE CONTENT			
Module No.	Content	Credits	No. of Hours
1	TYPES, BONDING AND MECHANISM OF POLYMERIZATION 1.1 INTRODUCTION TO POLYMER (5L) Monomers, Oligomers, Polymers and their characteristics. Classification of polymers: Natural, synthetic, linear, cross linked and network, Plastics, elastomers, fibers, Homopolymers and Copolymers. 1.2 BONDING IN POLYMERS (5L) Primary and secondary bond forces in polymers, cohesive energy. Determination of Molecular mass of polymers: Number Average molecular mass (M_n) and weight average molecular mass (M_w) of polymers. 1.3 MECHANISM OF POLYMERIZATION (5L) Chain growth polymerization: Cationic polymerization-anionic polymerization-free radical polymerization. Stereo regular polymers: Ziegler Natta polymerization, Step growth polymerization.	01	15

2	TECHNIQUES OF POLYMERIZATION AND POLYMER REACTIONS 2.1 TECHNIQUES OF POLYMERIZATION (5L) Bulk, Solution, Emulsion, Suspension, interfacial and gas phase polymerization. Salient features of different polymerization techniques 2.2 POLYMER ADDITIVES (05L) Fillers & Reinforcement, Plasticizers, Antioxidants & Thermal Stabilizers (Heat Stabilizers), Ultraviolet stabilizers, Fire retardants, Colorants, Antistatic agents & Curing agents. 2.3 POLYMER REACTIONS (05L) Introduction, Hydrolysis, Hydrogenation, Addition and Substitution reactions, Cross-linking reactions, Cure reactions, Reactions of various aliphatic and aromatic pendent groups in polymers.	01	15
	Total	02	30

Access to the Course

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

Methods of Assessment

The assessment pattern would be 40:60, 60% for Semester End Examination (SEE) and 40% for Continuous Internal Assessment (CIA). The structure of the SEE and CIA would be as recommended by the Board of Studies and approved by the Board of Examination and the Academic Council of the college.

References:

1. Polymer Science by V. R. Gowarikar, N. V. Visvanathan, Jaydev Shreedhar, New Age International Ltd. Publisher 1996. (Reprint 2012)
2. Textbook of Polymer Science by Fred Billmeyer, 3rd Edn. John Wiley and Sons New York 1984. (Reprint 2008)
3. Introductory Polymer Chemistry by G. S. Misra New Age International (P) Ltd. Publisher 1996.
4. Polymer Chemistry by Charles E. Carraher (Jr.), 6th Edn, New York-Basel.
5. Inorganic Polymers by G. R. Chatwal Himalaya Publishing House 1st Edn. 1996
6. Polymer Science—A Text Book by V. K. Ahluwalia, Anuradha Mishra.
7. Principles of Polymer Science by P. Bahadur, N. V. Sastry, 2nd Edn, Narosa Publishing House.
8. Polymer Chemistry by Ayodhya Singh, 2008, Campus Book International, New Delhi.
9. Organic Polymer Chemistry by Jagdamba Singh, R. C. Dubey, 4th Edn, 2012.
10. Adv. Polymer Chemistry by V.K. Selvaraj, 1st Edn, 2008, Campus International, New Delhi.
11. Organic Polymer Chemistry by V. Jain, IVY Publishing House, New Delhi.
12. Principles of Polymerization by George Odian 3rd Edn. John Wiley & Sons New York.

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