



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

**COURSE TITLE: POLYMER CHEMISTR-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	:	Polymer Chemistry-II
Course Code	:	S317CHT
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-VI

Paper No. V

Course Title: Polymer Chemistry-II

No. of Credits - 02

Type of Vertical: Elective-II

COURSE CODE: S317CHT

Learning Outcomes Based on BLOOM's Taxonomy:

After Completing the Programme, Student will be able to,

Bloom Level	CO No.	Course Outcome
Understand	CO1	Understand degradation mechanism and crystallinity in polymers.
Understand	CO2	describe analysis and spectroscopic, physical testing methods of polymers.
Understand	CO3	understand different processing techniques of polymers

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: Polymer Chemistry-II

No. of Credits - 02

Type of Vertical: Elective-II

COURSE CODE: S317CHT

COURSE CONTENT			
Module No.	Content	Credits	No. of Hours
1	THE PROPERTIES OF POLYMERS, ANALYSIS AND PROCESSING 1.1 POLYMER DEGRADATION (3L) 1.1.1 Types of Polymer Degradation, Thermal degradation, mechanical degradation, photodegradation, Photo stabilizers. 1.2 CRYSTALLINITY IN POLYMERS (04L) 1.2.1 Introduction, Degree of Crystallinity, Crystallisability, crystallites 1.2.2 Factors affecting Crystallisability, Effect of crystallinity on the properties of polymers. 1.3 ANALYSIS AND TESTING OF POLYMERS (05L) 1.3.1 Spectroscopic Methods: IR, NMR 1.3.2 Thermal analysis: Differential Scanning Calorimeter (DSC), Thermo Gravimetric Analysis (TGA) 1.3.3 Physical testing: Mechanical properties, Thermal properties, Optical properties, Electrical properties, Chemical properties. 1.4 INTRODUCTION TO POLYMER PROCESSING (3L) 1.4.1 Processing Techniques: Calendaring, die casting, compression moulding, injection moulding, blow moulding and reinforcing.	01	15

2	INDUSTRIAL AND BIOPOLYMERS 2.1 INDUSTRIAL POLYMERS (7L) 2.1.1 Preparation of fiber forming polymers, elastomeric material. 2.1.2 Thermoplastics: Polyethylene, Polypropylene, polystyrene, Polyacrylonitrile, Poly Vinyl Chloride, Poly tetrafluoro ethylene, nylon and polyester. 2.1.3 Thermosetting Plastics: Phenol formaldehyde and epoxide resin. Elastomers: Natural rubber and synthetic rubber - Buna - N, Buna-S and neoprene. 2.1.4 Conducting Polymers: Elementary ideas, examples: poly Sulphur nitriles, poly phenylene, poly pyrrole and poly acetylene. 2.2 BIO POLYMERS AND BIODEGRADABLE POLYMERS (8L) 2.2.1 Structure of proteins, properties and applications of cellulose derivatives-Cotton and rayon. 2.2.2 Cellulose plastics; cellulose acetate, cellulose nitrate and regenerated cellulose. Structure and applications of starch, chitin and chitosan. 2.2.3 Commercial applications of natural polymers – lignin, Kerogen, amber, asphaltenes, 2.2.4 Biodegradable polymers, examples. Biomedical applications of 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. (Reprint2008)
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, (First Indian Print 2005), New York-Basel.
5. Inorganic Polymers by G. R. Chatwal Himalaya Publishing House 1st Edn. 1996
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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, Published by Campus Book International, New Delhi.
9. Organic Polymer Chemistry by Jagdamba Singh, R. C. Dubey, 4th Edn, 2012.
10. Advanced Polymer Chemistry by V. K. Selvaraj, 1st Edn, 2008, Published by 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.
