

GUJARAT TECHNOLOGICAL UNIVERSITY

Diploma in Plastic Engineering

Semester: 3

Subject Code

Subject Name POLYMER CHEMISTRY – I

Sr. No.	Course content
1.	ORGANIC CHEMISTRY : 1.1 Introduction 1.2 Carbon : Structure and configuration SP-I, SP-II, and SP-III 1.3 Types of Bond 1.3 Bond angle, Bond length and Bond energy 1.4 Electronegativity, Polar Bonds, Bond Polarity and Dipole moment 1.5 Classification of Organic Compounds 1.6 Nomenclature of Organic Compounds 1.7 Basic concepts of Monomer 1.8 Structure and preparation of different Monomer 1.9 Purification of Monomer
2.	BASIC CONCEPTS OF POLYMER : 2.1 Different types of Monomer 2.2 Functionality of Monomer 2.3 Effect of functionality on Polymer Structure 2.4 Types of Polymer based on : <ul style="list-style-type: none">- Structure- Repeating unit- Applications- Source- Nature and Processing
3.	POLYMERIZATION REACTIONS : 3.1 Addition Polymerization reactions : <ul style="list-style-type: none">- Free radical polymerization- Ionic polymerization- Co-ordination polymerization 3.2 Condensation Polymerization <ul style="list-style-type: none">- Poly condensation polymerization- Poly addition polymerization 3.3 Rearrangement and Sterio Polymerization 3.4 Co-Polymerization <ul style="list-style-type: none">- Free radical polymerization- Ionic polymerization- co-poly condensation polymerization
4.	POLYMERIZATION TECHNIQUES AND MECHANISM : 4.1 Bulk Polymerization 4.2 Solution Polymerization 4.3 Suspension Polymerization

	4.4 Emulsion Polymerization 4.5 Gas-Phase Polymerization 4.6 Solid State Polymerization 4.7 Interfacial Polymerization
5.	GLASS TRANSITION TEMPERATURE 5.1 Introduction 5.2 Glassy State 5.3 Visco-elastic State 5.4 Visco-fluid State 5.5 State of Aggregation 5.6 Orientation of Polymer - Internal Brownian Movement - External Brownian Movement 5.7 Glass transition temperature and associated properties 5.8 Relationship between Glass transition temperature with polymer properties

Reference Books:

Sr.No.	Name of Reference	Author
1.	Organic Chemistry	P.L.Sony
2.	Textbook of Organic Chemistry	Bahl & Tuli
3.	Textbook of Polymer Science	Billmeyer Jr.
4.	Polymer Science	V.R.Govariker
5.	Polymer Science of Technology	Jod R. Fried
6.	Experimental Plastics and Synthetic resin	G.F.Dalelo
7.	Textbook of Organic Chemistry	R.K.Bansal
8.	Polymer Science and Technology of Plastics & Rubber	Pramanoy Ghosh
9.	Polymer Chemistry	Seymour & Carraher
10.	Polymer Chemistry	Arora & Singh
11.	Principles of Polymer Chemistry	A Ravve