Course Type	Course Code	Name of Course	L	T	P	Credit
DE	NCYD502	Polymer Chemistry	3	0	0	3

Course Objective
• With this course students will learn synthesis, structure, properties of polymers and mechanism of polymerizations along their processing and characterizations.
Learning Outcomes
• Classify different polymers based on their sources and properties. • Establish mechanism and kinetics of polymerizations along with molecular weight property relationship. • Identify the importance of polymers in the field of Biomedical, electronics and advanced applications. • Utilize the concept of polymerization for copolymer and stereo regular polymers synthesis.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Introduction and common applications of polymers. Classification of polymers. Kinetics and mechanism of chain growth and step growth polymerization. Polymerization processes (Bulk, Solution, Emulsion and Suspension). Molecular weight, molecular weight distribution and degree of polymerization. Significance of Molecular weight and distribution, Experimental methods for determination of molecular weight. Structure-property relationship of polymers. Commercial thermoplastic and thermosetting polymers- Synthesis, properties and applications.	14L	This unit provides an in-depth knowledge about the fundamentals of polymers, various characteristics. It also provides a detailed idea about the synthesis and applications of various commercial polymers.
2	Copolymers: Classification, synthesis and application. Stereochemistry of Polymerization. Polymer synthesis procedures – FRP, ATRP, RAFT, ROMP, MP, ROP. Synthesis and applications of biodegradable, biomedical polymers. Conducting Polymers. Inorganic Polymers, Vulcanization of Rubbers.	14L	This unit deals with the in-depth knowledge on various techniques for synthesis of copolymers. Also deals with the different biopolymers, conducting polymers, in brief idea about rubbers.
3	Polymer processing, Glass transition temperature: significance and determination. Analysis and Testing of Polymers. Advanced Polymers: Smart Polymers, Shape Memory Polymers,	14L	It provides an in-depth knowledge on polymer processing.

	Self-Healing Polymers, LCP, Branched polymers (star, dendritic and hyper branched polymers).		
Total		**42**	

Text Books:

1. Polymer Science & Technology–Plastics, Rubbers, Blends and Composites. Premamoy Ghosh. 3rd Edition, McGraw Hill Education (India) Private Limited, 2010.

Reference Books:

1. Principles of polymerization, George G. Odian, 4th Edition, A John Wiley &Sons, Inc., Publication, 2004.
2. Textbook of Polymer Science, W. F. Billmeyer, 3 rd Edition, A John Wiley & Sons, Inc., Publication, 2007.