

GUJARAT TECHNOLOGICAL UNIVERSITY

PLASTIC TECHNOLOGY

B. E. SEMESTER: VII

Subject Name: **Manufacturing of Thermoplastic Materials**

Subject Code: **172304**

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	University Exam (E)		Mid Sem Exam (Theory) (M)	Practical (Internal)
				Theory	Practical		
3	0	2	5	70	30	30	20

Sr. No	Course Content	Total Hrs.
1.	MANUFACTURING OF THERMOPLASTIC MATERIALS A. COMMODITY PLASTICS: Manufacturing, Properties, Applications of LDPE, LLDPE, HDPE, PVC, PP, PS, PVA, ETC. 1. Industrial Production methods and Chemistry for POLYETHYLENE <ul style="list-style-type: none"> • Manufacture of LDPE using high pressure process, details of starting materials, process parameters, reactor design, control of molecular weights and molecular weight distribution, etc. • Manufacture of HDPE using low pressure process, details of starting materials, process parameters, reactor design, control of molecular weights and molecular weight distribution, etc. • Manufacture of LLDPE using low pressure process, details of starting materials, process parameters, reactor design, control of molecular weights and molecular weight distribution, etc. • Manufacture of MDPE using low pressure process, details of starting materials, process parameters, reactor design, control of molecular weights and molecular weight distribution, etc. 2. Manufacturing Methods and chemistry of Polypropylene, Polyvinyl chloride, Polystyrene, ABS, SAN, etc. in detail. Process line diagram, process parameters, molecular weight distribution, etc.	18
	B. ENGINEERING PLASTICS : Manufacture, chemistry, Structure / property relationship, Properties and applications of PMMA, Polyamides, chlorinated polyether, poly acetal, Poly carbonate, poly sulphone, PPO, PTFE, PCTFE, PVF, PVDF, etc.	06

	C. HEAT RESISTANCE THERMOPLASTICS: Manufacturing process, application, properties of poly amide, poly imides, poly ether sulfone, PPS-poly amide-imide, PEEK. Chemistry of Polyamides, polyamide-imides, PES, PEEK, LCP, etc. along with relationship of properties and structure to applications. Engineering applications of PES, PEEK, LCP, etc.	06
2.	FUNCTIONAL POLYMERS:	
	A. Photo conductive polymers: Definition, properties of ideal photo conductive polymers, power of photo conductive polymers, mat. Preparation, application.	03
	B. Ion exchange polymers: Classification, synthesis, properties, application	02
	C. Bio polymers: Introduction, proteins, nucleic acids, polysaccharides.	03
	D. Spiro & ladder polymers: Purpose, structure, mechanism & properties.	02
	E. Electro conductive polymers: Introduction, comparison with metals, def., methods of synthesis, advantages of; use of; polymers, application.	02

Text Book:

1. Polymer technology: D.C. Miles & J.H. Brydson.

Reference Books:

1. Textbook of polymer science: Fred W. Billmeyer .jr.
2. Plastic material: J.A.Brydson
3. Polymer chemistry: Stevens.
4. PVC technology: Titow
5. Engg. Thermoplastics: Margolis J.M
6. Introduction to industrial polymers: Henri Ulrich.