



# GUJARAT TECHNOLOGICAL UNIVERSITY

**Bachelor of Engineering**

**Subject Code: 3162314**

**Semester – VI**

**Subject Name: Thermoplastic Elastomers**

**Type of course: Professional Elective Course**

**Prerequisite:**

**Rationale:** The course designed here will help the students to understand basic properties and Application of various Thermoplastic Elastomers. It will also help the students how to process Thermoplastic Elastomers. To apply knowledge of processing and properties of Thermoplastic Elastomers for manufacturing various products.

**Teaching and Examination Scheme:**

Teaching Scheme			Credits C	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
			ESE (E)	PA (M)	ESE (V)	PA (I)		
3	0	2	4	70	30	30	20	150

**Content:**

Sr. No.	Content	Total Hrs
1	Introduction: Thermoplastic Elastomers and Plastic Industries, History and Growth, Advantages and Disadvantages, Types of Thermoplastic Elastomers	8
2	Styrenic Thermoplastic Elastomers Introduction-Structure, Synthesis and commercial production, Morphology, Property/Composition Relationships, Polymer Physical properties, Commercial Applications	8
3	Thermoplastic Polyolefin Elastomers Introduction, Definition and Composition of TPOs, Properties of TPOs, Processing of TPOs, Applications	5
4	Copolyester Thermoplastic Elastomers Introduction, Mechanical and Electrical Properties, Designing with Copolyester Elastomers, Chemical and Environmental Properties, Processing, Applications	8
5	Thermoplastic Polyurethane Elastomers Introduction, Chemistry, Processing of Thermoplastic Polyurethane Elastomers, TPU Market and Applications,	8
6	Polyamide Thermoplastic Elastomers Introduction, Properties, Compounding, Processing, Application	5



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## **Suggested Specification table with Marks (Theory): (For BE only)**

<b>Distribution of Theory Marks</b>					
R Level	U Level	A Level	N Level	E Level	C Level
<b>15</b>	<b>25</b>	<b>15</b>	<b>10</b>	<b>3</b>	<b>2</b>

**Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)**

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

### **Reference Books:**

1. Handbook of Thermoplastic Elastomer : Benjamin M. Walker & Charles P.Rader
2. SPI Plastics Engineering Handbook: Michael L Berins
3. Handbook of Elastomers: New Development & Technology : Anil K. Bhowmick
4. Plastic Materials: J. A. Brydson

### **Course Outcomes:**

The theory should be taught and practical should be carried out in such a manner that students are able to acquire required learning out comes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

Sr. No.	CO statement	Marks % weightage
CO-1	Classify the basic characteristic and types of Thermoplastic Elastomers	15
CO-2	Explain the manufacturing process of Thermoplastic Elastomers.	20
CO-3	Described the various properties of Thermoplastic Elastomers.	25
CO-4	Identify the various application of Thermoplastic Elastomers.	20
CO-5	Apply the knowledge of processing for manufacturing various products.	20

### **List of Experiments: - As per the syllabus topics**



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**Major Equipment:**

**List of Open Source Software/learning website:**

- i. <https://www.nptel.com>
- ii. [www. Bpf.co.uk](http://www.Bpf.co.uk)