

GUJARAT TECHNOLOGICAL UNIVERSITY

PLASTIC TECHNOLOGY (24)

THERMOPLASTIC ELASTOMERS

SUBJECT CODE: 2722414

SEMESTER: II

Type of course: Elective

Prerequisite: NA

Rationale:NA

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)		
		ESE	OEP			PA	RP			
3	2#	0	4	70	30	30	0	10	10	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	CLASSIFICATION OF THERMOPLASTIC ELASTOMERS: Introduction to Thermoplastic Elastomers (TPE) Polyolefin – based thermoplastic elastomers – Block copolymer, Random Block polymers, Graft copolymers, Polyolefin blend TPE’s preparation, Properties, processing and applications.	10	30
2	THERMOPLASTIC ELASTOMERS FROM CONVENTIONAL POLYMERS: Polyvinylchloride based Thermoplastic Elastomers – PVC/Nitrile Rubber blends, PVC/Polyurethane blends, PVC/Co-polyester elastomer blends. Styrenic Thermoplastic Elastomers – Manufacture, Properties, Compounding, Processing and Applications.	5	10
3	POLYURETHANE ELASTOMER: Thermoplastic Polyurethane Elastomer – Raw materials, Synthesis, Properties, Processing, Blends and Applications.	05	10
4	POLYAMIDE AND POLYETHER BASED ELASTOMER: Polyamides based Thermoplastic Elastomers – Polyamide thermoplastic elastomers, Preparation properties, Structure – Property relationship, Processing and applications. Thermoplastic Polyether ester Elastomers – Synthesis, polymer structure and Morphology, Properties, Blends and applications.	12	30
5	THERMO PLASTIC ELASTOMER FROM BLENDS: Dynamically vulcanized Thermo Plastic Elastomer Blends – Introduction - Preparation of Elastomer – Plastic blends by dynamic vulcanization,	8	20

	properties and applications. Ionomeric Thermoplastic Elastomers: Synthesis, Properties, ionic interactions in polymer blends and applications of ionomeric elastomers.		
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Reference Books:

1. G.Holden, N.R. Legge, R. Quirk, H.E. Schrolder, Thermoplastic Elastomers – 2nd Edition, Hanser Publishers, Munich, 1996.
2. Anil K. Bhowmick, Howard L. Stephens, Hand Book of Elastomers New Developments and Technology, Marcel Dekker, Inc., New York, 1988.
3. S.K. De, Anil K. Bhowmick, Thermoplastic Elastomers from Rubber – Plastic Blends, Ellis Horwood, New York, 1990.
4. Benjamin M. Walker, Hand Book of Thermoplastic Elastomers, Van Nostrand Reinhold Company, New York, 1979.

Course Outcomes:

At the end of the course, the student should be able to

1. Know the unique characteristics of different TPUs over thermoplastics and elastomers
2. Proper selection of suitable TPU for right application
3. Correlate the structure and properties of different TPUs
4. Select different processing equipments based on the nature of TPU

Review Presentation (RP): The concerned faculty member shall provide the list of peer reviewed Journals and Tier-I and Tier-II Conferences relating to the subject (or relating to the area of thesis for seminar) to the students in the beginning of the semester. The same list will be uploaded on GTU website during the first two weeks of the start of the semester. Every student or a group of students shall critically study 2 papers, integrate the details and make presentation in the last two weeks of the semester. The GTU marks entry portal will allow entry of marks only after uploading of the best 3 presentations. A unique id number will be generated only after uploading the presentations. Thereafter the entry of marks will be allowed. The best 3 presentations of each college will be uploaded on GTU website.