



GUJARAT TECHNOLOGICAL UNIVERSITY

Master of Engineering

Subject Code: 3732407

Semester – III

Subject Name: Thermoplastic Elastomers

Type of course: Program Elective V

Prerequisite:

Rationale:

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	0	3	70	30	0	0	100

Content:

Sr. No.	Content	Total Hrs
1	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	7
2	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..	12
3	Thermoplastic Polyurethane Elastomer – Raw materials, Synthesis, Properties, Processing, Blends and Applications	10
4	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	10
5	Dynamically Vulcanized Thermo Plastic Elastomer Blends – Introduction - Preparation of Elastomer – Plastic blends by dynamic vulcanization, properties and applications. Ionomeric Thermoplastic Elastomers: Synthesis, Properties, ionic interactions in polymer blends and applications of ionomeric elastomers	10
6	New Developments in Thermoplastic Elastomers: Case studies for specific applications.	5



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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:

Sr. No.	CO statement	Marks % weightage
CO-1	Identifying materials which can work for manufacture of Thermoplastic Elastomers	15
CO-2	PVC based TPE materials..developments and applications	15
CO-3	Thermoplastic PU based TPE ‘s ..applications and manufacture	15
CO-4	Polyamide based TPE’s..development, Rheology ,applications	15
CO-5	Vulcanised TPE’s ,,developments, processing,applications	15
CO-6	Case studies for development of new materials	25

List of Open Source Software/learning website:

1. www.sciencedirect.com
2. http://www.altinelpvc.com/altinelpvc/media/pdf/conta_teknik_bilgiler_en.pdf
3. https://scholar.google.co.in/scholar?q=thermoplastic+elastomer+ppt&hl=en&as_sdt=0&as_vis=1&oi=scholart