GUJARAT TECHNOLOGICAL UNIVERSITY

Rubber Technology

B. E. SEMESTER: VI

Subject Code: **162605**

Subject Name: **Thermoplastic Elastomers & Polymer Blends**

Sr. No.	Course Contents	Total Hrs
1.	**Introduction :** Introduction of Thermoplastic elastomers, Synthesis, Morphology of Thermoplastic Elastomers, Properties & Effect of Structure, Thermodynamics of Phase Separation, Thermoplastic Elastomers of Surfaces, Rheology & Processing, The Heat Fugitive Cross link	04
2.	**Styrene-Butadiene-Styrene Triblocks & Related Materials:** Preparation, Structure, Properties, compounding & Processing, Applications	06
3.	**Polyether-Ester Thermoplastic Rubbers :** Synthesis & Structure, Properties, Processing, Applications	06
4.	**Ethylene Vinyl Acetate Rubbers (EAM/EVA):** **Manufacturing**, Properties, Processing,Compounding, Applications Vulcanizable & Thermoplastic EVA Rubbers:	06
5.	**Polyurethene Rubbers :** Introduction, Isocynates, Preparation Chemistry of a polyurethane rubbers, Polyols Cast Polyurethene Rubbers, Unstable Prepolymer Systems, Stable Prepolymer Systems, Quasi-Prepolymer Systems, One-shot Systems, Markets for Cast Polyurethene Elastomers, Millable Gums, Polyurethene foams & Micro cellular Reaction, Moulded Polyurethenes, Other uses of Polyurethanes **Thermoplastic Polyurehene Rubbers :** Preparation & Structure, Properties, Processing, Applications, Chemistry, Morphology & Thermal Responses, Molecular Weight Effects, Chemical c/s Effects, Environmental Stability & Stabilization, Compounding, Commercial Polymers & their properties	10
6.	**Thermoplastic Polyolefin Rubbers:** Formulation & Structure, General Properties, Applications	04

	Halogenated Polyolefin Alloy Thermoplastic Rubbers	
7.	**Thermoplastic Natural Rubber Blends:** **Elastomer-Thermoplastic Blends as Thermoplastic Elastomers:** Rubber & Plastics used in Blends**:** Introduction, Preparation of Rubber-Plastic Blends, Phase Morphology, Properties of Unvulcanised Rubber-Plastic Blends, Properties of Blends prepared by Dynamic Vulcanisation, Technological Applications, Poly (Vinyl Chloride) Blends, Nitrile Elastomers with PVC**:** Research & Development, Structure-Property Relationships, Polyesters with PVC, Ethylene Copolymers with PVC, Other Polymeric Plasticizers with PVC, Thermoplastic Polyolefin Rubbers (TPO) **:** Formulation & Structure, General Properties, Applications, Butyl Rubber with Polyethylene & Polypropylene, Ethylene/Propylene Copolymers & Terpolymers with Polyethylene & Polypropylene **Other Blends:** Ethylene-Acrylate Copolymers with Polyethylene, Poly (Dimethylsiloxane) with Polyethylene **Polyester amides & Polyether ester amides:** **Thermoplastic Polyamide Elastomers :** Introduction, Segmented Block Copolymers, Structure & Morphology **Polyester amides & Polyether ester amides Thermoplastic Elastomers :** Synthesis & Morphology,Physical Properties of PEA & PEEA,Tensile Propreties, High Temperature Tensile Properties, Dry Heat Aging, Humid Aging, Chemical & Solvent Resistance, Tear Strength, Abrasion Resistance, Compression Set, Flex Properties, Adhesion, Weatherability, Electrical Properties, Processing Characteristics, Potential Applications.	05
8.	**Rubber-Rubber Blends:** Introduction, Morphology, Analytical methods for Blend Characterisation, Preparation of Rubber Blends, Properties of Rubber Blends	05
9.	**Additional Types of Thermoplastic Elastomers :** Thermoplastic 1,2-Polybutadiene, Trans-1-4-Polyisoprene.	
10.	**Crosslinked Polyethylene:** Introduction, Basic Structure, Compounding & Mixing of Polyethylene, Processing, Physical Properties of Crosslinked Polyethylene, Applications of Crosslinked Polyethylene	04

Text Books:

1) Handbook of Elastomers: New Development & Technology, Edited by Anil K. Bhowmick, Howard L. Stephens
2) Thermoplastic Elastomers: A Comprehensive Review, Edited by N. R. Legge, G. Holden, H. E. Sehroeder
3) Rubber Materials & Their Compounds, by J. A. Brydson

Reference Books:

4) Handbook of Thermoplastic Elastomer, Edited by Benjamin M. Walker
5) Science & Technology of Rubber, Edited by James E. Mark, Burak Erman, Frenrick R. Eirich
6) Handbook of Rubber Technology, Volume-3: Recycling & Pollution Control in Rubber Industries, Edited by J. M. Martin, W. K. Smith