GUJARAT TECHNOLOGICAL UNIVERSITY

Master of Engineering
Subject Code: 3724006
Semester – II
Subject Name: Speciality Elastomers & its Technology

Type of course: Program Elective-III (M.E.Rubber Technology)

Prerequisite:

Rationale:

Teaching and Examination Scheme:

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

Content:

Sr. No	Course Content	Total Hrs
1.	Modified natural rubber: Hydrogenated natural rubber, chlorinated natural rubber, hydro halogenated natural rubber, cyclized natural rubber, resin-modified natural rubber, poly(methylmethacrylate)-grafted natural rubber, enpcaf-modified natural rubber, liquid natural rubber.	**8**
2.	Chemical modification of synthetic elastomers : Hydrogenation, cyclization, isomerization, halogenation and hydrohalogenation and recent developments.	**8**
3.	Short fiber-filled rubber composites : Introduction to rubber composites, methods for the analysis of fiber orientation, mixing effects.	**8**
4.	Tetrafluoroethylene-propylene rubber: Introduction, manufacturing, polymer structure and fundamental properties, compounding and vulcanization, vulcanizate properties and applications.	**7**
5.	Carboxylated rubber : Introduction, preparation of carboxylic rubbers, composition of carboxylated emulsion polyfvlers, vulcanization of carboxylated rubbers, scorch, and bin storage stability of carboxylic elastomers, compounding ingredients for carboxylated elastomers, physical properties, applications for carboxylated elastomers	**8**
6.	Acrylic-based elastomers : Introduction, basic structure, methods of production, compounding techniques, processing characteristics, vulcanization methods, physical properties, applications.	**7**
7.	Crosslinked polyethylene : Introduction, basic structure, compounding and mixing of polyethylene, processing, physical properties of crosslinked polyethylene, applications of crosslinked polyethylene.	**8**

Reference Books:

- Handbook of Elastomers edited by Ani1 K. Bhowmick and Howard l. Stephens.
- Handbook of Specialty Elastomers by Robert C. Klingender.

Course Outcome:

Sr. No.	CO Statement	Marks % weightage
CO-1	Learn about different grades of Natural Rubber and Synthetic Rubber.	15
CO-2	Learn about the Composites of rubber with short fiber and mixing effects of Short fiber-filled rubber composites	20
CO-3	Know about the importance of fibre orientation.	15
CO-4	Understand the vulcanizate properties and applications of Tetrafluoroethylene-propylene rubber.	20
CO-5	Production of Acrylic-based elastomers.	15
CO-6	Learn about processing & physical properties of crosslinked polyethylene.	15

List of Experiments:

Tutorials/Presentation/Practicals based on above topics

Major Equipments:

Mixing Mill, Calender Machine, Extruder, Abrasion Tester, Ross Flexing Machine etc.

List of Open Source Software/learning website:

- **http://www.crcpress.com**
- **http://journal.ippi.ac.ir/**

http://www.expresspolymlett.com/