

GUJARAT TECHNOLOGICAL UNIVERSITY

Rubber Technology B. E. SEMESTER: VI

Subject Name: **Synthetic Rubbers**

Sr. No.	Course Contents	Total Hrs
1.	(A) General Purpose Synthetic Rubber Styrene-Butadiene Rubber (SBR) : Introduction, Preparation, Structure and Variations of Emulsion SBRs, Structure and Variations of Solution SBRs, IISRP Numbering System, General Properties, Comparison of Solution and Emulsion SBRs, Compounding, Processing, Applications. Polybutadiene Rubber (PBR) : Manufacture, Structure and Properties of Polybutadienes, IISRP Numbering System, Classifications, Processing and Applications. Synthetic Polyisoprene (IR) Rubbers: Preparation of Synthetic Polyisoprene (IR) Rubbers, Properties, IISRP Numbering System, Processing, Applications Ethylene-Propylene Rubbers (EPM & EPDM): Introduction, Manufacture, Structure and Properties, Variables between Grades, General Vulcanizate Properties, Processing, and Compounding. Isobutene-Isoprene (Butyl) Rubbers : Introduction, Manufacture, Structure-Property Relationships, Grades, General Vulcanizate Properties, Processing, Compounding, Applications of Unmodified Butyl Rubbers, Halobutyl Rubbers, Vulcanization, Applications, Cross-linked Butyl Rubbers.	16

Sr. No.	Course Contents	Total Hrs
2.	(B) Special Synthetic Rubbers: Chloroprene Rubber (CR) : Introduction, Production of Polychloroprene, Structure of CR & Structural Variables, Classification, Structure & Properties, Processing, Compounding (Curing Systems & other additives), Applications	16

3.	Acrylonitrile Butadiene (Nitrile) Rubbers: Introduction, Preparation, Structure & Properties General Vulcanizate Properties, Processing, Compounding (Blends with other polymers) Special Grades of Nitrile Rubber, Applications. Silicones/Silicone Rubber : Introduction, Nomenclature of Organosilicone Compounds & Elastomers, Manufacture of Silicone Elastomers, Structure & Properties of Silicone Elastomer Polymers, General Properties, Compounding (Curing Systems, Fillers, Other additives), Processing, Liquid Silicone Rubbers, Room Temperature Vulcanizing Rubbers (RTV), Applications. Acrylic & Other Rubbers with Ester side chain : Introduction Acrylic Rubbers (ACM) : Chemistry, General Properties , Compounding & Processing & Vulcanization. Ethylene-Methyl Acrylate Rubbers (AEM) : Properties, Compounding, Processing ,Applications	03
4.	Fluoro Rubbers : Introduction, Copolymers based on Vinylidene fluorides & Hexafluoro propylene (Grades, Compounding, Processing, Properties, Applications), Copolymers based on Vinylidene fluorides & Chlorotrifluoro ethylene (CFM), Perfluorinated Elastomers, Tetrafluoro ethylene, Propylene Copolymers, Polyphosphazene, Carboxy, Nitroso Rubbers Polysulphides, Polyethers & Halogenated Polyethylene : Introduction	04
5.	Polysulphide Rubbers: Manufacturing, Structure & Properties, Vulcanization & Compounding, Liquid Polysulphides, and Applications.	04
6.	Epichlorhydrin Rubbers (CO, ECO, AECO): Manufacturing, Structure & Properties, General Properties, Processing, Compounding, Applications,	03
7.	Propylene Oxide Rubbers (GPO): Structure & Properties, Processing, Compounding, Applications	03

8.	Chlorinated & Chlorosulphonated Polyethylenes (CM & CSM): Structure & Properties of CSM Rubbers, Compounding & Vulcanization of CSM Rubbers, Applications of CSM Rubbers, Properties of CM Rubbers, Compounding & Vulcanization of CM Rubbers, Applications of CM Rubbers	05
----	--	----

Practical:

It should be based on theories.

Text Books:

1. Synthetic Rubbers, their Chemistry and Technology, by D. C. Blackley
2. Handbook of Elastomers: New Development & Technology by Anil K. Bhowmick, Howard L. Stephenes

Reference Books:

1. Rubber Technology, by Maurice Morton
2. Rubbery Materials & their Compounds, by J. A. Brydson