GUJARAT TECHNOLOGICAL UNIVERSITY

RUBBER ENGINEERING (40)
RUBBER CULTIVATION & RUBBER LATTICES
SUBJECT CODE: 2714003
SEMESTER: I

Type of course: Core-II (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)	PA (V)		PA (I)		
						ESE	OEP	PA	RP	
3	2#	2	5	70	30	20	10	10	10	150

Content:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
1	Latex Production Methods from Rubber Tree: Reinforced on Quotes on Rubber Tree, Life Span of Latex Rubber Trees, Latex Seed Germination, Grafting the Rubber Tree, Latex Tree Extraction, Tapping the Rubber Tree for it Sap, Collection, history of Yield of latex in different countries, Pests and diseases, Irrigation requirement of rubber trees, Effect of various covers on soil fertility under Hevea brasiliensis muell. arg. and on growth of the tree.	8	15
2	Natural Latices: Cultivation, Cultivation of Species Other Than Hevea Brasiliensis, Allergic reactions preservation, concentration, constitution, biogenesis of poly isoprenes and other naturally occurring lattices etc.	7	15
3	Synthetic Latices - general principles of production: Introduction, emulsion polymerization reaction, preparation of functionalize lattices by emulsion co-polymersation, agglomeration and concentration.	8	15
4	Individual types of synthetic Latices: Introduction, lattices of styrene-butadiene copolymers, acrylonitrile-butadiene copolymers, polychloroprene rubber lattices, vinyacetate polymer and copolymers, polyacrylates and polymethyl acrylates esters: acrylic latices, vinychloride-vinylidine chloride copolymers, functionalized synthetic lattices, etc.	8	15
5	Artificial Latices: Introduction, effect of latex particle size on rate of creaming or sedimentation, methods of production, types, etc.	7	15
6	Prevulcanized Chemically modified Latices: Introduction, sulphur prevulcanization, organic and hydrogen peroxide prevulcanization, radiation prevulcanization, prevulcanization of SBR, NBR and butyl rubber lattices.	8	15

7	Other than prevulcanized Chemically modified Latices: Introduction, epoxidation, graft-copolymerization, cis-trans isomerization, cyclization, halogenation, hydro halogenation, halogen alkylation, depolymerization and oxidation, inter penetrating polymer networks, modifications at surface of latex particles.	8	10

Reference Books:

1. Polymer Latices by D C Blackley, volume 2 Chapman and Hall
2. Rubber & Rubber Planting by R.H.Lock

Course Outcome:

After learning the course the students should be able to:

1. Learn about Irrigation requirement of rubber trees.
2. Understand the Tapping of Rubber Tree for it Sap & Collection.
3. Know about the Cultivation, preservation, concentration, constitution of Natural Latex.
4. Identification & preparation of Synthetic Latices.
5. Production of Artificial Latices.
6. Learn about Chemical Modification of Latices.
7. Understand the Chemical reaction of Latices.

List of Experiments:

Tutorials/Presentation/Practicals based on above topics

Open Ended Problems:

1. Techniques for removal of Latex Allergy.
2. Process Technology of Latex Modified Systems for Concrete & Mortar.
3. Polymer Modified Asphalt Emulsion

Major Equipments:

Plantary Mixer, Jarmill, Mechanical Atability Tester, Turbo Stirrer

List of Open Source Software/learning website:

- http://www.crcpress.com
- http://www.taylorandfrancis.com
- The American Synthetic Rubber Research Program. Philadelphia: University of Pennsylvania Press.