GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Engineering

Level: Post Graduate

Branch: Rubber Technology

Course / Subject Code : ME01088051

Course / Subject Name : Rubber Cultivation & Rubber Lattices

w. e. f. Academic Year:	2024-25
Semester:	1st Semester
Category of the Course:	PEC

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes
01	Learn about the irrigation requirements of rubber trees.
02	Identify and prepare synthetic latices.
03	Produce artificial latices.
04	Understand the chemical reactions involving latices.

Teaching and Examination Scheme:

Teaching Scheme (in Hours)			Total Credits L+T+ (PR/2)	Assessment Pattern and Marks				Total Marks
				Theory		Tutorial / Practical		
L	T	PR	C	ESE (E)	PA / CA (M)	PA/CA (I)	ESE (V)	
03	00	02	04	70	30	20	30	150

Course Content:

Unit No.	Content	No. of Hours	% of 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.	07	15
2.	Natural Latices: Cultivation, Cultivation of Species Other Than Hevea Brasiliensis, Allergic reactions preservation, concentration, constitution, biogenesis of poly isoprene and other naturally occurring lattices etc.	06	15

3.	**Synthetic Latices:** general principles of production: Introduction, emulsion polymerization reaction, preparation of functionalize lattices by emulsion co-polymerization, agglomeration and concentration.	07	15
4.	**Individual types of synthetic Latices:** Introduction, lattices of styrene-butadiene copolymers, acrylonitrile-butadiene copolymers, polychloroprene rubber lattices, vinyl acetate polymer and copolymers, polyacrylates and polymethyl acrylates esters: acrylic latices, vinychloride-vinylidine chloride copolymers, functionalized synthetic lattices, etc.	07	15
5.	**Artificial Latices:** Introduction, effect of latex particle size on rate of creaming or sedimentation, methods of production, types, etc.	05	15
6.	**Prevulcanized Chemically modified Latices:** Introduction, Sulphur prevulcanization, organic and hydrogen peroxide prevulcanization, radiation prevulcanization, prevulcanization of SBR, NBR and butyl rubber lattices.	06	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.	07	10
	Total	**45**	**100**

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
00	10	20	10	10	20

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

References/Suggested Learning Resources:

(a) Books:

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

Suggested Course Practical List: If any
Practical based on above topics.

List of Laboratory/Learning Resources Required:

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

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