

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. SEMESTER: V

RUBBER TECHNOLOGY

Subject Name: **Latex Technology**

Subject Code: **152602**

Teaching Scheme				Evaluation Scheme		
Theory	Tutorial	Practical	Total	University Exam (Theory) (E)	Mid Sem Exam (Theory) (M)	Practical (I)
3	0	3	6	70	30	50

Sr. No.	Course content (Introduction)
1.	Latex Tapping & Concentration Methods: Theory of creaming & centrifuging, Standards for centrifuged Concentrated latex, Parameters, Significance of Specification limits, Test methods theory & practice, Preparation of emulsion and dispersion of stabilizers, Compound ingredients, Vol. agents, All anti-oxidants & Fillers. Pre vulcanized latex and its applications.
2.	Fundamental Latex Characteristics: Particle size & distribution, Stability & destabilization of lattices, Concentration, Viscosity, Concentration relationship, Surface, Free energy & wetting behaviour, Zeta- potential, Electrical properties of colloidal systems, Thermal measurement of molecules, Kinetics of brownian motion.
3.	Types of Latices: Synthetic lattices, Artificial lattices, Chemically modified lattices.
4.	Natural Latex Colloid: Preservative, Redox-potential changes, Degradation leading to volatile fatty acid formation, Constitution of fresh & ammonia preserved NR latex, Properties of centrifuged latex as required for foam & dipped goods manufacturing synthetic latexes.
5.	Gelation of Natural Latex: Zinc oxide solubility with pH, Heat gelling systems, Delayed action gelling system using sodium silicofluoride, Significance of pH/time gelation cure foaming, Frothing time cure, Foam, Viscosity, Delayed action gelling.
6.	Stability Tests For Natural Latex, Mechanical & Chemical: KOH number test, Zinc oxide viscosity test, Zinc oxide thickening test, Kalaxon stability tester mechanical stability test, Determination of gelling pH.

7.	Manufacture of Foam Rubber: Preparation of latex, Compounding, Maturing, Batch foaming process, Selection of mould, Mould filling continuous foaming, Gelling, Vulcanising, Drying, Talo-cay process & other mfg. process, Physical properties.
8.	Latex Dipped Goods: Outline of dipping process, Dipping methods, Production of articles like gloves, balloons, etc., Manufacturing process of articles & specification tests.
9.	Latex Thread: Compounding, Formulations. Manufacturing process.
10.	Latex Casting & Moulding: Slush moulding, Rotational moulding, Casting with porous & non-porous moulds, Compounding.
11.	Latex Based Adhesives: Introduction, Applications for latex based adhesives, Advantages & disadvantages of latex based adhesives relative to other types of adhesives, Formulatory principles for latex based adhesives.
12.	Latex Based Adhesives for Paper, Leather & Wood: Adhesives based upon NR Latex, Adhesives based upon SBR Lattices, Adhesives based upon vinyl acetate, Homopolymer & Copolymer latices, Latex based adhesives for metals, ceramics, plastics & glass, etc.
13.	Latex Based Rubber to Textile bonding Adhesives: The problem of rubber to textile adhesion, Evaluation of rubber to textile adhesion, Latex-protein adhesives doe rubber to textile bonding, Resorcinol-Formaldehyde Latex (RFL) adhesives for rubber to textile bonding, Latex-Polyscocynate adhesives for rubber to textile bonding.
14.	Latex Carpet Backings: Resume of latex application in carpet industry, Methods of applying latex compounds to carpet back, Typical formulations for latex based carpet backing compounds, Bound-crumbs carpet underlay, Latex foam rubber carpet underlay.
15.	Test for Latex: Total solids, Dry rubber content, Total alkalinity, Viscosity, Coagulum content, Sludge content, pH, VFA number, Surface tension, Determination of Mooney viscosity of contained polymer, Determination of rubber styrene of contained polymer.

Practical and Term Work:

Based as per the syllabus prescribed.

Reference Books:

1. Natural Rubber Science & Technology By: Roberts.
2. Hand book of Rubber Projects, Tech. & Product Formulary. By: SBP Consultants & Engineers (P) Ltd.
3. Polymer Latices Vol. 2, by D. C Blackley.
4. Polymer Latices Vol. 3, by D. C Blackley.