

GUJARAT TECHNOLOGICAL UNIVERSITY

Rubber Technology B. E. SEMESTER: VI

Subject Name: **Rubber Compound & Product Testing**

Sr. No.	Course Contents	Total Hrs
1.	Importance of Testing in Rubber Industries: Introduction, Precision, Accuracy & Validity, Specimen Preparation, Standard Temperature	02
2.	Control & Service testing: Need for standardization-viscosity, scorch, instruments used & their calibration, optimum cure & the use of curometer.	04
3.	Test of Natural & Synthetic Rubbers: Plasticity, Scorch & Cure rate, tack, Plasticity Retention index, Determination of Sp.Gr. Green Strength, Shrinkage. Density & Dimensions Short-Term Stress & Strain Properties: Hardness, Tensile Stress/Strain, Compression/Stress/Strain, Shear Stress/Strain, Flexural (Blending) Stress/Strain, Tear Test Dynamic Stress & Strain Properties: Rebound Resilience, Dynamic Modulus, Loss Modulus, Tan Delta, Loss Compliance, Shear Modulus (Free Vibration Methods, Forced Vibration Methods) Friction & Wear Creep, Relaxation & Set Properties Fatigue Property: Flex-cracking & Cut growth Tests, Heat Buildup Abrasion Property: by DIN Abrasion, Pieco, Ansle etc.	32

	Cross link Density: Volume Swelling, Cross-link Density	
	Electrical Tests: Resistance & Resistivity, Surface Charge, Electric Strength, Tracking Resistance, Permittivity & Power Factor	
	Permeability: Gas Permeability & Vapor Permeability	
4.	Environmental Resistance: Moist Heat & Steam Tests, Effect of Liquids, Effect of Gases, Weathering, Biological Attack, Fire, Radiation	04
5.	Aged Property: Air Ageing, Heat Ageing & Oil Ageing	03
	Weathering Trials: Introduction, Materials, Characterization, Specimen Preparation Trial Aspects, Exposure, Angle of Exposure, Withdrawal Intervals, Meteorological Data, Evaluation	
	Age Weathering Procedures: Sun-Concentrating Devices, Exposure under Stress	
6.	Weathering-Environmental Correlation: Short term-One Site, Long term-Multisite	02
7.	Rubber from Natural Sources: Volatile matter-Dirt-Ash content, Acetone Extract analysis, Nitrogen content, Rubber hydrocarbon content. Rubber Products : Test for Rubber products like: Pyrolysis tests. Extract analysis, Total sulfur, Organic sulfur, In-organic sulfur, Free sulfur, Filler Analysis, Estimation of NR, IR, SBR, IIR, NBR.	07

Practical:

It should be based on theories.

Text Books:

1. Physical Testing of Rubber By: R.P. Brown
2. Rubber Engineering – IRI

Reference Books:

- 1) ASTM Standards for Rubbers and Rubber products.