

GUJARAT TECHNOLOGICAL UNIVERSITY

Rubber Technology B. E. SEMESTER: VI

Subject Code: 162601

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

	<p>Cross link Density:</p> <p>Volume Swelling, Cross-link Density</p>	
	<p>Electrical Tests:</p> <p>Resistance & Resistivity, Surface Charge, Electric Strength, Tracking Resistance, Permittivity & Power Factor</p>	
	<p>Permeability:</p> <p>Gas Permeability & Vapor Permeability</p>	
4.	<p>Environmental Resistance:</p> <p>Moist Heat & Steam Tests, Effect of Liquids, Effect of Gases, Weathering, Biological Attack, Fire, Radiation</p>	04
5.	<p>Aged Property:</p> <p>Air Ageing, Heat Ageing & Oil Ageing</p>	03
	<p>Weathering Trials:</p> <p>Introduction, Materials, Characterization, Specimen Preparation Trial Aspects, Exposure, Angle of Exposure, Withdrawal Intervals, Meteorological Data, Evaluation</p>	
	<p>Age Weathering Procedures:</p> <p>Sun-Concentrating Devices, Exposure under Stress</p>	
6.	<p>Weathering-Environmental Correlation:</p> <p>Short term-One Site, Long term-Multisite</p>	02
7.	<p>Rubber from Natural Sources:</p> <p>Volatile matter-Dirt-Ash content, Acetone Extract analysis, Nitrogen content, Rubber hydrocarbon content.</p> <p>Rubber Products :</p> <p>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.</p>	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.