

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. (Rubber Technology)

PROPOSED TEACHING SCHEME

(W.E.F. July 2012)

Semester III

SR. No.	SUBJECT	TEACHING SCHEME(HOURS)			CREDIT S
		THEORY	TUTORIAL	PRACTICAL	
	Major Elective IV	4	2	0	5
734001	Rubber Waste Utilisation	2	0	0	2
730001	Seminar	0	0	4	2
730002	Presentation of Literature Review	0	0	0	2
730003	Dissertation Phase-I	0	0	18	9
	TOTAL	6	0	24	20

Sr. No.	Major Elective - IV
734002	Elastomeric Gel & Polymer Clay(Synthesis Group)
734003	Powder & Particulate Technology(Product & Process Design Group)

GUJARAT TECHNOLOGICAL UNIVERSITY

Master of Engineering (Rubber Technology)

Semester – III

Subject Name : Rubber Waste Utilisation

Subject Code :734001

Sr.No.	Subject Content
1.	Introduction: Types and Specification of the wastes, Waste reuse, The manufacture of other materials and articles from wastes, Waste hierarchy etc.
2.	Rubber Waste disposal Options : Retreading, Crumbling,Pyrolysis, Incineration Re-use and Disposal etc.
3.	Rubber Waste Disposal Techniques : Life cycle of a rubber product, Recycling : Barriers and Benefits, Land filling, Reuse of waste as drainage culverts, Resource depletion etc.
4.	Incineration : Waste to energy incineration, Incineration of waste as a fuel substitute, advantages etc.
5.	Pyrolysis : Introduction, Pyrolysis Process, Product obtained from Vacuum Pyrolysis, Recovery of Byproducts,
6.	Energy Recovery : Options for energy recovery from waste tyres, Impacts of tyres in energy recovery, Mass & Energy balance, Co-production of energy and activated carbon black from rubber wood waste etc.
7.	Utilisation of Rubber waste : Concept of Green Technology,Production of corrugated asbestos boards, roofings , tie plates, Rezdor slabs and floor slabs for stock farms, crumb rubber, reclaim rubber, rubber asphalt and other applications etc.

Text Book	Reference Book
1. Reprocessing of Tyres and Rubber Waste by Valadimir M. Makarov &Valerij F. Drozdovski	1. Enegry from Rubber Waste Proceedings .

GUJARAT TECHNOLOGICAL UNIVERSITY

Master of Engineering (Rubber Technology)

Semester – III

Subject Name : Powdered and Particulate Rubber Technology (Elective-4)

Subject Code: 734003

Sr.No.	Subject Content
1.	Introduction& comparison
2.	Availability & Manufacture of Powdered Rubber: Preparation, Partitioning Agents, Comparison of Commercial Grades.
3.	Compounding , Mixing &Moulding: Preparation of Powdered Rubber compound, Processing Techniques, Dispersion ,Moulding, adhesives and dough etc.
4.	Advantages of Powdered and Particulate Rubbers :Mixing Cycle Comparison, Power Consumption Comparison, Temperature Comparison etc.
5.	Extrusion & Compaction: Handling of Compounds, Different extrusion techniques, Different Extruders for direct extrusion etc.
6.	Effect of Powder Technology :Effect on Mixing Cycle Times, Energy Savings, Plant Maintenance Costs , Continuous production , Polymer Blends etc.
7.	Economics & Environmental Considerations :Comparison, Different area for Energy Savings, Cost Savings in several areas of production etc.
8.	Testing: Standard Testing, Assessment of dust in solid rubber chemicals, comparison with other forms of rubbers etc.

Text Book	Reference Book
1. Powdered and Particulate Rubber Technology by Colin W. Evans	1. Handbook of Elastomers Edited by Dr. A.K.Bhowmick& Dr. Howard L. Stephens

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Master of Engineering (Rubber Technology)

Semester – III

Subject Name : Elastomeric Gel & Polymer Clay (Elective-IV)

Subject Code:734002

Sr.No.	Subject Content
1.	Introduction: Electrically Conductive & Photonic Polymers, Magnetically Activated Polymers, Ferroelectric Polymers, Liquid Crystal Elastomers, Dielectric Elastomers, Ionic and Nonionic Polymer Gels,
2.	Ionic Polymeric Gel : Introduction, PAPMS Gels, Gel Preparation, Gel Application etc.
3.	Ionic Polymers : Engineering, Industrial and Medical Applications etc.
4.	Silicone Gel : Manufacturing, Properties, Applications Comparison, Correlation etc.
5.	PAMPS Gel : Introduction, PAMPS Gel, Gel Preparation, Gel Application etc.
6.	Polymer/ Rubber Clay : Introduction, Preparation & Properties, Effect of Vulcanisation ingredients etc.
7.	Working with Polymer Clay : Conditioning, Storage, Sizing Clay, Polymer Clay Tools, Curing, Finishing, Mixing Clay Colors
8.	Working with Liquid Polymer Clay & Metal Clay : Introduction, Metal Clay Tools, Processes, Applications etc.

Text Book	Reference Book
1. Polymer Clay Mixed Media Jewelry by Shirley Rufener	1. Advanced Rubber Composites by G.Heinrich.
2. Artificial Muscles- Applications of Advanced Polymeric Nanocomposites by Mohsen Shahinpoor, Kwang J .Kim, MehranMojarad.	