GUJARAT TECHNOLOGICAL UNIVERSITY

RUBBER TECHNOLOGY (40)

RUBBER WASTE UTILISATION (RW)
SUBJECT CODE: 2744003
SEMESTER: IV

Type of course: Major Elective - V

Prerequisite: NA

Rationale: NA.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P	C	Theory Marks		Practical Marks				
				ESE (E)	PA (M)	PA (V)		PA (M)		
						ESE	OEP	PA	RP	
3	2#	0	4	70	30	30	0	10	10	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	Introduction: Types and Specification of the wastes, Waste reuse, The manufacture of other materials and articles from wastes, Waste hierarchy etc.	**8**	**15**
2	Rubber Waste disposal Options : Retreading, Crumbling ,Pyrolysis, Incineration Re-use and Disposal etc.	**8**	**15**
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.	**8**	**10**
4	Incineration : Waste to energy incineration, Incineration of waste as a fuel substitute, advantages etc.	**7**	**15**
5	Pyrolysis : Introduction, Pyrolysis Process, Product obtained from Vacuum Pyrolysis, Recovery of By products.	**7**	**15**
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.	**8**	**15**
7	Utilisation of Rubber waste : Concept of Green Technology, Production of corrugated asbestos boards, roofing , tie plates, Rezdor slabs and floor slabs for stock farms, crumb rubber, reclaim rubber, rubber asphalt and other applications etc.	**8**	**15**

Reference Books:

1. Reprocessing of Tyres and Rubber Waste by Valadimir M. Makarov & Valerij F. Drozdovski
2. Energy from Rubber Waste Proceedings.

Course Outcome:

After learning the course the students should be able to:

1. Understand the types and Specification of the wastes.
2. Identify & Compare the Rubber Waste disposal Options.
3. Able to understand the Pyrolysis Process, Product obtained from Vacuum Pyrolysis .
4. Learn about the different Rubber Waste Disposal Techniques.
5. Learn about how to convert the Waste into energy by incineration technique.
6. Importance of Concept of Green Technology.
7. Learn about Co-production of energy and activated carbon black from rubber wood waste.

Major Equipment:

Shredders, Oven, Muffle Furnace etc.

List of Open Source Software/learning website:

- http://www.bvsde.paho.org/
- http://www.crcpress.com
- https://www.linkedin.com/advancements-in-rubber-disposal-biodegradation-and-the-environment

Review Presentation (RP): The concerned faculty member shall provide the list of peer reviewed Journals and Tier-I and Tier-II Conferences relating to the subject (or relating to the area of thesis for seminar) to the students in the beginning of the semester. The same list will be uploaded on GTU website during the first two weeks of the start of the semester. Every student or a group of students shall critically study 2 papers, integrate the details and make presentation in the last two weeks of the semester. The GTU marks entry portal will allow entry of marks only after uploading of the best 3 presentations. A unique id number will be generated only after uploading the presentations. Thereafter the entry of marks will be allowed. The best 3 presentations of each college will be uploaded on GTU website.