GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. Semester: II

Plastic Engineering

Subject Name: **PLASTICS WASTE MANAGEMENT(Major Elective-III)**

Sr.No	Course content
1.	**Introduction –** Sources of plastics waste – Separation technologies, viz. Sorting – Manual, automated, Density separation, Flotation, Solvent separation, Melt filtration, Separation of resin from fiber in waste FRP.
2.	**Plastics waste management** – 4 R & I approach viz. Source reduction, Reuse, Repair, Recycling, and Incineration with examples. Plastics recycling – Classification – Code of practice - Primary, secondary, territory and quaternary recycling with examples – Co-extrusion and Co-injection moulding – Waste plastics as fillers.
3.	**Mechanical Recycling of Commonly Used Plastics, Such as PP, PE, PET, Etc. Mixed Waste Recycling** – co-extruded films waste, commingled waste – Extrusion flow moulding for production of plastics lumbers, chemical recycling/feedstock recycling processes for recovery of oil, monomer and energy – thermolytic processes. Solvolysis –process outline for PMMA, PET, etc. Fluidised bed incinerator with energy recovery.
4.	**Recycling of Plastics by Surface Refurbishing** – Application of a coating, polishing with examples – Plastics ageing – Environmental ageing – Thermal ageing – Chemical degradation – Wear and erosion. Biodegradable plastics – an over view.
5.	Environmental issues, policies and legislation in India, Review, Tutorial section. Plastics – Energy saving, Eco-friendly – Case studies. Life cycle analysis – a model.

Reference Books:

1. R. Johanner Brandrup, Recycling and recovery of plastics, Hanser Publishers, New York, 1996.
2. Nabil Mustafa, Plastics Waste Management, Disposal Recycling and Reuse, Marcel Dekker, Inc. New York, 1993.
3. Ehrig, Plastics Recycling, Products and Processes, Hanser Publishers, New York, 1992.
4. Gerald D. Andrews & Pallatheri M. Subramanian, Emerging Technologies in Plastics
5. Recycling, American Chemical Society, Washington, DC 1992.