

# RECYCLING OF PLASTIC

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CO-1 → Identify sources of plastic waste for the given situation.

LO-1 → Justify environmental sustainability of plastics.

CONTENT → Overview of environmental sustainability with Packaging, Transport, waste & waste management.

- Plastic Recycling & energy from waste.
- Hazards to Environment due to accumulation of plastic waste.

Method of Assessment → Internal Mid sem Test-1

Teaching Hours → 08H

Marks → 10M

LO-2 → select pollution control methods & identify the sources of plastic waste.

CONTENT → Pollution & Pollutant, Types of Pollutants, Ways to control the pollution.

Sources of plastic waste → Domestic, Industrial, Commercial & medical.

Need of Plastic waste management.

Method of Assessment → External Theory Exam

Teaching Hours → 07H

Marks → 10M

LO-3 → To collect various types of recyclable in Plastic waste industry.

CONTENT → Collect various types of recyclable various plastic waste. ~~Reduce primary recycling of waste plastic to get value added product.~~

Method of Assessment → External Practical

Teaching Hours → 06H

Marks → 10M



CO-3 → To select relevant methodology for plastic waste management.

LO-7 → Justify the selection of methodology of plastic waste management for the given situation.

CONTENT → Steps in Plastic waste management.  
4R terminologies of plastic waste management.  
Reduction, Reuse, Recycling, Recovery.

Method of Assessment → External Theory Exam  
Teaching Hours → 08H Marks → 10M

LO-8 → Justify the use of land-filling for the given plastic waste disposal.

CONTENT → Landfilling types.  
Recycling → Types of recycling such as primary, secondary, Tertiary & Quaternary, physical recycling, & chemical recycling (Definition only)

Method of Assessment → Internal → Assignment, Quiz, Surprise test  
Teaching Hours → 07H Marks → 10M

LO-9 → To perform recycling of waste plastics to get value added product in industry.

CONTENT → Perform primary recycling of waste plastics to get value added product.

Method of Assessment → Internal Practical  
Teaching Hours → 06H Marks → 10M

CO-4 → To select proper recycling methods for the given situation.

~~LO-10~~  
LO-10 → Justify the selection of relevant recycling method for the given situation.

CONTENT → Primary Recycling → Granulations, Cryogenic grinding, etc.  
Secondary Recycling → Melt processing  
Tertiary Recycling → Hydrolysis, Glycolysis, Methanolysis, Ammonolysis.

Method of Assessment → External Theory Exam  
Teaching Hours → 10H Marks → 10M

LO-11 → Analyze the energy recovery from plastic waste for the given situation.

CONTENT → Quaternary Recycling - Incineration, construction & working of Incinerator.  
Energy recovery from plastic waste → Pyrolysis (fuel recovery), Gasification (gas recovery).

Method of Assessment → External Theory Exam.  
Teaching Hours → 08H Marks → 10M

LO-12 → Utilize relevant plastic waste for manufacturing of granules.

CONTENT → Use extruder - granulator convert waste plastic into granules,  
Demonstrate Hydrolysis, Ammonolysis of waste plastic to recover chemicals.

Method of Assessment → External Practical  
Teaching Hours → 08H Marks → 10M

CO-5 → To impart the knowledge of ■ Biodegradation.

LO-13 → To understand the Biodegradation concept.

CONTENT → Biodegradation → Mechanism of biodegradation,  
Enzymes for biodegradation,  
Additives for biodegradation.  
Ecofriendly plastic - Bio-plastic.

Method of Assessment → External Theory Exam

Teaching Hours → 08H

Marks → 10M

LO-14 → To understand green technology & degree of biodegradability.

CONTENT → Green technology,  
Degree of biodegradability,  
Test to measure resistance of plastic to biodegradation.  
(Resistance to fungi & bacteria.

Method of Assessment → Internal Mid Sem Test-2

Teaching Hours → 07H

Marks → 10M

LO-15 → To prepare a report on applications of Bio-plastics & the resistance to biodegradation by Bacteria, fungi on waste plastic.

CONTENT → Analyze resistance to biodegradation by Bacteria, fungi on waste plastic,  
Prepare a report by collecting data of applications of various recyclable material / Bioplastics.

Method of Assessment → External Practical

Teaching Hours → 08H

Marks → 10M