

## E-Waste MANAGEMENT

(Open Elective-III)

<b>Course Code</b>	20EC2701B	<b>Year</b>	IV	<b>Semester</b>	I
<b>Course Category</b>	(open elective)	<b>Branch</b>	ECE	<b>Course Type</b>	Theory
<b>Credits</b>	3	<b>L-T-P</b>	3-0-2	<b>Prerequisites</b>	
<b>Continuous Internal Evaluation:</b>	30	<b>Semester End Evaluation:</b>	70	<b>Total Marks:</b>	100

<b>Course Outcomes</b>	
Upon successful completion of the course, the student will be able to	
<b>CO1</b>	Know about the environmental impacts of e-waste.
<b>CO2</b>	Apply various concept learned under e-waste management hierarchy.
<b>CO3</b>	Distinguished the role of various national and internal act and laws applicable for e-waste management and handling.
<b>CO4</b>	Analyze the e – waste management measures proposed under national and global legislations.

<b>Mapping of course outcomes with Program outcomes (CO/ PO/PSO Matrix)</b>														
Note: 1- Weak correlation    2-Medium correlation    3-Strong correlation														
* - Average value indicates course correlation strength with mapped PO														
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1						2	2							
CO2						2	2							
CO3						2	2							
CO4						2	2							

<b>Syllabus</b>		
<b>Unit No.</b>	<b>Contents</b>	<b>Mapped CO</b>
I	<b>Introduction.</b> E- waste; composition and generation. Global context in e- waste; E-waste pollutants, E waste hazardous properties, Effects of pollutant (E- waste) on human health and surrounding environment, domestic e-waste disposal, Basic principles of E waste management, Component of E waste management, Technologies for recovery of resources from electronic waste, resource recovery potential of e-waste, steps in recycling and recovery of materials-mechanical processing, technologies for recovery of materials, occupational and environmental health perspectives of recycling e-waste in India.	CO1
II	<b>E-waste hazardous on Global trade</b> Essential factors in global waste trade economy, Waste trading as a quint essential part of electronic recycling, Free trade agreements as a means of waste trading. Import of hazardous e-waste in India; India's stand on liberalizing import rules, E-waste economy in the organized and unorganized sector. Estimation and recycling of e-waste in metro cities of India.	CO1, CO2
III	<b>E-waste control measures</b> Need for stringent health safeguards and environmental protection laws in India, Extended Producers Responsibility (EPR), Import of e-waste permissions, Producer-Public-Government cooperation, Administrative Controls & Engineering controls, monitoring of compliance of Rules, Effective regulatory mechanism strengthened by manpower and technical expertise, Reduction of waste at source.	CO1, CO3
IV	E-waste (Management and Handling) Rules, 2011; and E-Waste (Management) Rules, 2016 - Salient Features and its likely implication. Government assistance for TSDFs.	CO1, CO4
V	The international legislation: The Basel Convention; The Bamako Convention. The Rotterdam Convention. Waste Electrical and Electronic Equipment (WEEE) Directive in the European Union, Restrictions of Hazardous Substances (RoHS) Directive	CO1, CO4

<b>Learning Resources</b>
<b>Text Books</b>
1.E-waste: implications, regulations, and management in India and current global best practices",Johri R., TERI Press, New Delhi
<b>Reference Books</b>
1. Electronic Waste – 1 <sup>st</sup> Edition (Toxicology and Public Health Issues), Fowler B. 2017Elsevier 2. Electronic Waste Management. Science ,Hester R.E., and Harrison R.M. 2009