

## 20EC2701B - E- WASTE MANAGEMENT

<b>Offering Branches</b>	ECE		
<b>Course Category:</b>	Open Elective -III	<b>Credits:</b>	3
<b>Course Type:</b>	Theory	<b>Lecture-Tutorial-Practical:</b>	3-0-0
<b>Prerequisites:</b>	-	<b>Continuous Evaluation:</b>	30
		<b>Semester End Evaluation:</b>	70
		<b>Total Marks:</b>	100

### Course Outcomes

Upon successful completion of the course, the student will be able to:

<b>CO1</b>	<b>Know</b> about the environmental impacts of e-waste.	K2
<b>CO2</b>	<b>Apply</b> various concept learned under e-waste management hierarchy.	K3
<b>CO3</b>	<b>Distinguished</b> the role of various national and internal act and laws applicable for e-waste management and handling.	K4
<b>CO4</b>	<b>Analyze</b> the e – waste management measures proposed under national and global legislations.	K4

### Contribution of Course Outcomes towards achievement of Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
<b>CO1</b>						2	2							2
<b>CO2</b>						2	2							2
<b>CO3</b>						2	2							2
<b>CO4</b>						2	2							2
<b>Avg.</b>						2	2							2

1- Low

2-Medium

3-High

### Course Content

<b>UNIT-1</b>	<p><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.</p>	CO1
<b>UNIT-2</b>	<p><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.</p>	CO1, CO2
<b>UNIT-3</b>	<p><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 &amp; Engineering controls, monitoring of compliance of Rules, Effective regulatory mechanism strengthened by manpower and technical expertise, Reduction of waste at source.</p>	CO1, CO3

<b>UNIT-4</b>	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
<b>UNIT-5</b>	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

### **Learning Resources**

<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 – 1st Edition (Toxicology and Public Health Issues) , Fowler B. 2017Elsevier 2. Electronic Waste Management. Science , Hester R.E., and Harrison R.M. 2009.