E – Waste Management

Course Code	23EC2601	**Year**	III	**Semester**	II
Course Category	OE-II	**Branch**	ECE	**Course Type**	Theory
Credits	3	**L-T-P**	3-0-0	**Prerequisites**	Nil
Continuous Internal Evaluation:	30	**Semester End Evaluation:**	70	**Total Marks:**	100

Course Outcomes		
Upon successful completion of the course, the student will be able to		BL
CO1	Understand the environmental impacts of E-waste.	L2
CO2	Apply conceptsof e-waste management hierarchy.	L3
CO3	Distinguish the role of various national and internal act and laws applicable for e-waste management and handling.	L4
CO4	Analyze the E – waste management measures proposed under national and global legislations.	L4

Mapping of course outcomes with Program outcomes (CO/ PO/PSO Matrix)
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**	**PSO1**	**PSO2**
CO1	2					2			2		2		2
CO2	2					2			2		2		2
CO3		2				2			2		2		2
CO4		3				3			3		3		3
Average	2	3				2			2		2		2

Syllabus		
Unit No.	**Contents**	**Mapped CO**
1	**Introduction.** 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
2	**E-waste hazardous on Global trade** 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

3	**E-waste control measures** 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
4	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
5	**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
Text Books
1. Johri R., E-waste: implications, regulations, and management in India and current global best practices, TERI Press, New Delhi 2. Hester R.E., and Harrison R.M, Electronic Waste Management. Science, 2009
Reference Books
1. Fowler B, Electronic Waste – 1st Ed., (Toxicology and Public Health Issues), 2017Elsevier
e-Resources
1. https://news.mit.edu/2013/ewaste-mit