

E – WASTE MANAGEMENT

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| Course Code | 20EC2701B | Year | IV | Semester | I |
| Course Category | Open Elective | 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

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| CO1 | Understand the environmental impacts of e-waste. (L2) |
| CO2 | Apply concepts of 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 | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO1 0 | PO1 1 | PO1 2 | PSO 1 | PSO 2 |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|--------------|--------------|--------------|
| 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 * (Rounded to nearest integer) | 2 | 3 | | | | 2 | 2 | | | 2 | | | 2 | |

Syllabus

| Unit No. | Contents | Mapped CO |
|-----------------|---|------------------|
| I | 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 |
| II | 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 | CO1, CO2 |

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| | 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. | |
| III | 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 |
| 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 |

| Learning Resources | |
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| 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 – 1 st Edition (Toxicology and Public Health Issues), 2017Elsevier | |
| E-Resources | |
| 1. https://news.mit.edu/2013/ewaste-mit | |