

BIOMEDICAL, HAZARDOUS AND E-WASTE MANAGEMENT

Paper Code: ETEN-401

Paper: Biomedical, Hazardous and E-Waste Management

L	T/P	C
3	1	4

INSTRUCTIONS TO PAPER SETTERS:

MAXIMUM MARKS: 75

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

Objective: This course covers various aspects of hazardous waste, biomedical waste and E-waste such as collection, segregation, recovery, labeling requirements, storage areas, treatment and disposal facilities.

UNIT – I

Sources, Composition and characteristic of hazardous waste, Hazardous Waste (Management and Handling) Rules, 1989 and amendments, Federal Hazardous Waste Regulations under RCRA, Superfund, CERCLA and SARA. Toxicology, public health impact, Protocols, issues and challenges in transportation of hazardous waste.

[T1, T2][No. of Hours: 11]

UNIT – II

Characterization of medical waste- Bio-medical wastes (Management and Handling) Rules, 1998, Amendments and guidelines, segregation, packaging, storage, transport of infectious waste. Techniques of Bio-medical waste management. Health and safety rules. Protocols, issues and challenges in transportation of Biomedical waste.

[T1, T2][No. of Hours: 12]

UNIT – III

Treatment method- Autoclave, Hydroclave, Microwave, Chemical Disinfection, Solidification and stabilization, Bioremediation, Thermal Conversion Technologies, accumulation and storage of hazardous waste, land disposal of hazardous waste, other treatment and disposal method. Common Hazardous Waste Treatment facilities (TSDF).

[T1, T2][No. of Hours: 11]

UNIT – IV

E-waste: Introduction, toxicity due to hazardous substances in e-waste and their impacts, domestic e-waste disposal, e-waste management, technologies for recovery of resource from electronic waste, guidelines for environmentally sound management of e-waste, occupational and environmental health perspectives of recycling e-waste in India.

[T1, T2][No. of Hours: 11]

Text Books:

- [T1] Tchobanoglous G., Theisen H., Viquel S.A., “Integrated Solid Waste Management: Engineering, Principles and Management issues”, Tata McGraw Hill Publishing Company Ltd., New Delhi.
- [T2] CPHEEO Manual on Municipal Solid Waste Management.

Reference Books:

- [R1] Peavy H.S., Rowe D.R., Tchobanoglous G., “Environmental Engineering”, Tata McGraw Hill Publishing Company Ltd., New Delhi.
- [R2] Cunningham W.P., Cunningham M.A., “Principles of Environmental Science”, Tata McGraw Hill Publishing Company Ltd., New Delhi.
- [R3] Johri R., “E-waste: implications, regulations, and management in India and current global best practices”, TERI Press, New Delhi.
- [R4] Krishnamoorthy B., “Environmental Management, Text Book and Cases”, PHI Learning (P) Ltd., New Delhi.