

CO815 WASTE MANAGEMENT 4-0-0-4

Year of Introduction:2022

Course Description:

The students will be exposed to different types of waste management their characteristics. In addition, the course will provide an overview of waste water, solid wastes and hazardous wastes and waste management policies and principles.

Learning Objective:

- To give an insight into the various types of waste and their disposal treatments.
- To provide an overview of waste water, solid wastes and hazardous wastes and waste management policies.
- To describe the various principles related to waste management.
- To understand the management of agricultural, industrial and commercial waste.
- To study role of waste management policies.

Pedagogy:

Theoretical classes will be conducted on waste management behalf of its concepts/strategies.

Syllabus:

Unit 1

Concept of Waste: Waste- types; definitions; Waste water: nature and types; sources and characteristics, treatment methods – physical, chemical, biological and advanced treatment methods; waste water treatment plants – composition of municipal and industrial waste waters, treatment and disposal.

Unit 2

Waste Management Principles: Solid Wastes – sources of origin- Types- qualitative and quantitative analysis- Municipal solid wastes- MSW management- collection, transportation and disposal- methods and procedures. Management of agricultural, commercial and industrial wastes- composting and vermicomposting, sanitary and secured land-fills, incineration, biogas production, recycling, 3R's principles of Waste water treatment - rules and regulations.

Unit 3:

Waste treatment and its management: Definition-Sources, Type, Compositions, Properties of Waste Municipal Solid Waste, –Waste Minimization and Recycling; Waste to energy conversion processes, Reduction, reuse and recycling, resources recovery and utilization. Environmental Impacts. Definition & Identification of Hazardous Waste – Sources and Nature of Hazardous Waste – Impact on Environment –Waste Site –Disposal of Hazardous Waste.

Unit 4:

E-waste: E-Waste, Indian and global scenario of e-Waste, Growth of Electrical and Electronics industry in India, E-waste generation in India, Composition of e-waste, Possible hazardous substances present in e-waste, Environmental and Health implications. Regulatory regime for e-waste in India. Emerging recycling and recovery technologies, Guidelines for environmentally sound management of e-waste, Environmentally sound treatment technology for e-waste, Guidelines for establishment of integrated e- waste recycling and treatment facility.

Unit 5 :

Waste Management Policies And E-waste: Waste management policies, polluter pays principle, wealth from waste, single cell protein, waste to energy – ethanol, biogas, hydrogen.

REFERENCES

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4. Bide,A.D. and R.R.Sundaresan. 2001. Solid Waste Management: Collection, processing and disposal. INSDOC, New Delhi
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9. LaGrega, M.D.Buckingham,P.L. and Evans, J.C. Hazardous Waste Management, McGraw Hill International Editions, New York, 1994.
10. Richard J. Watts, Hazardous Wastes - Sources, Pathways, Receptors John Wiley and Sons, New York, 1997.
11. Waste Bank: Waste Management Model in Improving Local Economy, DwiWulandari, Sugeng Had iUtomo, Bagus Shandy Narmaditya, International Journal of Energy Economics and Policy, 2017, 7(3), 36-41

12. The role of waste bank partnership in efforts to decrease waste volume in urban: A case study at a waste bank in Kalibaru, Cilodong, Depok City, IOP Conference Series: Earth and Environmental Science, Suparmini, PurnawanJunadi.
13. Waste Bank as Community-based Environmental Governance: A Lesson Learned from Surabaya DyahRetno Wijyantia, Sri Suryania, Procedia - Social and Behavioral Sciences 184 (2015) 171 – 179 .
14. Community-based Solid Waste Bank Model for Sustainable Education NurIndrianti, Procedia - Social and Behavioural Sciences 224 (2016) 158 – 16
15. R.E.Landrefh and P.A.Rebers,| Municipal Solid Wastes-Problems & Solutions| ,Lewis, 1997.
16. Blide A.D.& Sundaresan, B.B,||Solid Waste Management in Developing Countries||, INSDOC, 1993.
17. Georges E. Ekosse, Rogers W'O Okut-Uma, Pollution control & Waste management in Developing Countries, Commonwealth Publishers, New Delhi, 2000.
18. B. B. Sundaresan, A. D. Bhide – Solid Waste Management, Collection, Processing and Disposal, Mudrashilpa Offset Printers, 2001.

ADDITIONAL REFERENCES

1. <https://www.wm.com/us>
2. <https://www.journals.elsevier.com/waste-management>
3. <https://www.epa.gov/hw/hazardous-waste-recycling>

Course Outcome:

CO1. Insight into the various types of waste and their disposal treatments.

CO2. Overview of waste water, solid wastes and hazardous wastes and waste management policies CO3.

Principles related to waste management.

CO4. Management of agricultural, industrial and commercial waste. CO5. Role of waste management policies.

Evaluation Pattern:

Theoretical examinations will be conducted to evaluate the knowledge on waste management, waste management policies and on the concepts of waste management.

Employability:

- Employment consulting services
- Local municipal and regional services

- Engineering construction
- Recyclable material wholesalers
- E-waste management