

Waste Management System

Course Contents:

1. Waste problematic and waste management development

- a. Waste management and environmental protection.
- b. Waste management concept.
- c. International conventions.
- d. Information systems in waste management.

2. Waste disposal, landfill recultivation

- a. Landfill kinds, Landfill placement, town-planning and building management, landfill founding and building-up. Landfill operation and monitoring. Operating documentation.
- b. Design of landfill recultivation, technical and biological recultivation, integration in the landscape.
- c. Relict landfill and old ballast saving. Economy.

3. Waste collection, sorting, modification, removal

- a. Transport systems in waste management. Techniques and technologies of waste sorting.
- b. Dangerous waste, waste records, collection, sorting, transport. Dangerous waste removal techniques and technologies.
- c. Solidification, fixation, vitrification, bitumenation, cementation.

4. Municipal, house and trade waste

- a. Basic characteristics, formation, ways of communal, house and trade waste treatment.
- b. Packaging waste, packaging waste collection systems.
- c. Return product and packaging taking-in, reusable packaging, returnable packaging.

5. Industrial waste

- a. Waste resources and characteristics, collection systems, sorting, transport and removal- except food industry.

6. Material and energy use waste utilization

- a. Waste recycling. Utilization of metal, glass, paper, plastic, textile wastes.
- b. Car wrecks and electrical waste treatment.
- c. Thermic waste disposal. Characteristics of waste as a fuel.

7. Prevention of waste origin

- a. Cleaner production, project methodology, evaluation methods in use.
- b. Assessment of products life cycle (LCA), eco design, ecologically friendly products.
- c. Environmental systems of management.

8. Waste management legislation

- a. The Waste Act, implementing regulations.
- b. The Packaging Act, implementing regulations.
- c. European and related legislation.

9. Biowastes of plant origin

- a. Agricultural biowastes.
- b. Forestry and timbering biowastes.
- c. Usage possibilities -- combustion of plant mass.

10. Biowastes of livestock farming

- a. Manure.
- b. Dung-water
- c. Usage possibilities.

11. Biowastes of food industry

- a. Waste characteristics from flour-milling industry, malting and brewing industries, starch industry, spirit industry, sugar, fat and oil industries, preserving, wine, yeast and fermentation industries, milk and meat-packing industries.

12. Biological waste utilization

- a. Sewage of wastewater treatment plant.
- b. Composting.
- c. Anaerobic digestion.

Learning outcomes and competences:

Generic competences:

- Ability to analyse and synthesize
- Ability to work independently
- Professional knowledge
- Skilled at utilizing and processing information

Specific competences:

- Conceptually solve and design the equipment for waste treatment
- Implement practical findings and researches in the field of Waste Management
- Orientation in basic laboratory procedures for waste management