

TEACHING DISCIPLINE: INTEGRATED WASTE MANAGEMENT

(Specialization Environmental Engineering; 2nd Year of study, 4th Semester)

Credit value (ECTS): 4

Course category: mandatory

Course holder: Camelia Elena Luchian

Discipline objectives (course and practical works)

- understanding and capitalizing on the basics in the field of waste storage and recycling;
- the knowledge and the correct use of the specialized notions in the field of waste management;
- understanding of the provenance and characterization of the types of waste from the physical and chemical point of view;
- knowledge of the possibilities of waste recycling;
- identification of the methods of collection, storage, treatment, and recovery of waste to improve the quality of the environment.

Contents (syllabus)

COURSE (Chapters / Subchapters)
1. The waste
1.1. General notions
1.2. Waste classification
1.3. Waste properties
2. Environmental legislation in the field of waste
3. Municipal waste
3.1. Classification
3.2. Quantities and composition
3.3. Household waste
3.4. Road waste
3.5. Construction waste
4. Industrial waste management in Romania
4.1. Mining waste dumps and technological plant
4.2. Tailings ponds
4.3. Management of waste and residues in the mining industry.
5. Waste collection and sorting
6. Elements of waste transfer
6.1. Location of transfer stations
6.2. Structure and type of transfer stations
7. Waste landfills
7.1. Simple storage of waste
7.2. Conditions for designing a controlled landfill for waste
7.3. Controlled storage of waste
7.4. Types of controlled deposits
7.5. The stages of setting up a closed warehouse
7.6. Criteria for closing a controlled warehouse
8. The characteristics of the exploitation of the controlled deposits
8.1. Geosynthetic materials used in the construction of landfills
9. Methods for collecting and spreading the leachate
9.1. Monitoring and control of gases from landfills controlled by waste
10. Thermal and biological treatment of waste
10.1. Waste incineration
10.2. Anaerobic fermentation
10.3. Aerobic fermentation

11. Waste recycling
Practical works
1. Determination of the quantity of municipal solid waste
2. Determination of the physical, chemical and biological properties of solid waste
3. Pre-collection of waste - determining the required number of bins or containers, for a locality, for 24 hours
4. Determination of waste collection routes
5. Types of waste collection and transport machines
6. Case study: hazardous waste deposits for an economic agent in the mining industry
7. Design of waste recovery and recycling station (SRM)
8. Case study: landfill for an economic agent in the pharmaceutical industry
10. Case study: methods of treatment, composting of residues on a winemaking farm
11. Project presentation; conclusions
14. Recap. Conclusions on the analyzes carried out

Bibliography

1. **Atudorei A., Paunescu I., 2002** - *Gestiunea deșeurilor urbane*, Ed. Matrix Rom, București
2. **Bold O. V., Mărăcineanu, 2003** - *Managementul deșeurilor solide urbane*, Ed. Tehnica, București
3. **Bold O. V., Mărăcineanu, 2003** - *Managementul deșeurilor solide urbane*, Ed. Tehnica, București
4. **Bularda Gh., Bularda D., Catrinescu T., 1992** - *Reziduuri menajere, stradale și industriale*. Ed. Tehnica, București
5. **Bularda Gh., Bularda D., Catrinescu T., 1992** - *Reziduuri menajere, stradale și industriale*. Ed. Tehnica, București
6. **Oros V., Drăghici C., 2002** - *Managementul deșeurilor*, Ed. Universității Transilvania, Cluj Napoca
7. **Oros V., Drăghici C., 2002** - *Managementul deșeurilor*, Ed. Universității Transilvania, Cluj Napoca
8. *** *Legea nr.211 din 15 noiembrie 2011 privind regimul deșeurilor*
9. **** *Best Available Techniques Reference Document for the Waste Treatments Industry – Cele mai bune tehnici pentru tehnologiile de tratare a deșeurilor*
- 10.**** *Ordin nr. 756/2004 pentru aprobarea Normativului tehnic privind incinerarea deșeurilor*
- 11.*****Directiva 2006/12/CE a Parlamentului european și a consiliului din 5 aprilie 2006 privind deșeurile*
- 12.*****HOTĂRÂRE nr.1.470 din 9 septembrie 2004 privind aprobarea Strategiei naționale de gestionare a deșeurilor și a Planului național de gestionare a deșeurilor modificată prin HOTĂRÂRE nr.358 din 11 aprilie 2007 pentru modificarea anexei nr. 2 "Planul național de gestionare a deșeurilor" la Hotărârea Guvernului nr. 1.470/2004 privind aprobarea Strategiei naționale de gestionare a deșeurilor și a Planului național de gestionare a deșeurilor*

Evaluation

Evaluation form	Evaluation Methods	Percentage of the final grade
Course	Exam	60
	Course presence	10
Practical works	Tests + cours and practical	30

Contact

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