**III.2.18 SOLID AND HAZARDOUS WASTE MANAGEMENT**

**A. Course description**

**1. Credit points: 2 ECTS**

**2. Time commitment**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Items | Lecture | Tutorial/  Exercise | Practice/  Assignment | Lab-work | Total |
| No. of hours | 11 | 3 | 6 | 0 | 20 |

**3. Prerequisites**

not specified

**4. Recommended background knowledge**

Active available knowledge in solid waste management and soil science as well as chemistry & physics

**5. Subject description**

Hazardous waste is waste that owing to its toxic, infectious, radioactive or flammable pro­per­ties poses an actual or potential hazard to the health of humans, other living organisms, or the environment. Topics of management will be transferred concerning generation, storing, trans­port, processing and final repositories in according to the Basel Convention.

**6. Objectives & Outcome**

Students should be able to understand the complex fields of management of hazard waste from generation until final repository. They should have knowledge about main management strategies and processing technologies. They should be able to apply the basic principles of HWM in their future professional way. The practicals should support the understanding of basic principles of processing technologies.

**7. Assessment/ Evaluation**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Component | Attendance | Exercises | Practical | Reports | Midterm | Final |
| Percentage % | 05 | 20 | 25 | 0 | 0 | 50 |

**8. Prescribed Textbook(s):** N/A

- Integrated Solid Waste Managementby Tchobanoglous/Theisen/Vigil; Publisher: McGraw Hill

**B. Course content**

Lecture &Exercises:

1. Introduction to the Lecture
2. Introduction into Hazardous Waste Management
3. Hazardous Waste: Identification of Types
4. HW policy and Regulatory Requirements
5. Examples for Management in some Institutions
6. Processing and disposal methods (e.g. HL-radioactive waste)
7. HWsite clean-uptechnologies
8. Summary to the Lecture

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Class** | **Contents** | **Hours** | | | **Ref./Resources** | **Assignment(s)** |
| **Lect.** | **Exr.** | **Prc.** |
| 1 | **Introduction to the Lecture** | 0.5 |  |  |  |  |
| 2 | **Introduction into Hazardous Waste Management** | 1.5 | 1.0 |  |  |  |
| 3 | **Hazardous Waste: Identification of Types** | 2.5 |  |  |  |  |
| 4 | **HW policy and Regulatory Requirements** | 2.0 |  |  |  |  |
| 5 | **Examples for Management in some Institutions** | 2.0 | 1.0 |  |  |  |
| 6 | **Processing and disposal methods**  (e.g. HL-radioactive waste) | 3.0 |  | 4.0 |  |  |
| 7 | **HW site clean-up technologies** | 1.5 |  |  |  |  |
| 8 | **Summary to the Lecture** |  | 1.0 |  |  |  |

Practicals:

1. Test different mechanisms and purposes of combustion and pyrolysis on simulated hazardous pollution
2. Test different plasma technology as treatment method in comparison to different filter techniques on simulated hazardous pollution

Exercise: AnalyseTianjin accident under viewpoint of HWM; Domestic hazardous waste; HWM in Hospitals; Vietnamese laws for HWM

**C. Reference Literature**

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| [1]. M.D. LaGrega, P.L. Buckingham, J.C. Evans: Hazardous waste management,  Waveland Press, Inc., 2010 (ISBN 978-1-57766-693-6) |
| [2]. C. VanGuilder: Hazardous Waste Management – An Introduction,Mercury Learning and Information, Dulles, Virginia; Boston, Massachusetts, 2012 (ISBN 978-1-936420-26-1) |