# Urban Waste Management

Code: MK5HUGKK3TX17-EN

ECTS Credit Points: 3

Evaluation: exam

Year, Semester: 2nd year, 1st semester

Its prerequisite(s): -

Further courses are built on it: No

Number of teaching hours/week (lecture + practice): 2 + 0

Topics:

This subject aims to cover different areas of waste management. Legislation and regulation of wastes. European Union waste management policy, waste strategy in the EU. Municipal solid waste (MSW), hazardous waste, sewage sludge, and other wastes. Life cycling analysis of materials recycling. Waste containers, collection systems, transport. The logistics of solid waste collection. Types of collection systems, equipment, and personnel requirements. The economics of waste management. Options of waste treatment and disposal. Waste landfill, types of waste landfilled. Waste incineration, incineration technologies. Other waste treatment technologies: pyrolysis, gasification, composting, anaerobic digestion. Composting of municipal solid wastes. Environmental, public, and industrial health considerations. Hazardous waste definition, classification and generation. Green engineering and sustainable design aspects. Integrated waste management strategies.

Literature:

Required:

* Jerry A. Nathanson, Richard A. Schneider: Basic Environmental Technology: Water

Supply, Waste Management and Pollution Control. Prentice Hall (6th Edition, 2015), 456 pages, ISBN-13: 9780132840149

* George Tchobanoglous and Frank Kreith: Handbook of Solid Waste Management.

McGraw-Hill Education (2nd edition, 2002), 950 pages, 2002, ISBN-13: 9780071356237 Recommended:

* Paul T. Williams, Waste Treatment and Disposal. John Wiley & sons, Ltd. (2nd edition, 2005), 392 pages, ISBN-13: 9780470849132
* Trevor Letcher, Daniel Vallero: Waste: A Handbook for Management. Academic Press (1st edition, 2011), 604 pages, ISBN 9780123814753
* Alireza Bahadori: Waste Management in the Chemical and Petroleum Industries, Wiley, 2013. ISBN: 978-1-118-73175-8

Schedule

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| 1st week Registration week  |  |
| 2nd week: Lecture: The current situation and challenges of waste management in the  | 3rd week: Lecture: Legislation and regulation of wastes. European Union waste management policy, waste strategies.  |
| world. Environmental, public, and industrial health considerations. 4th week: Lecture: Options of waste treatment and disposal. The economics of waste management. Waste management plans.  | 5th week: Lecture: The logistics of solid waste collection. Waste containers, types of collection systems, equipment, and personal requirements.  |
| 6th week: Lecture: Waste landfill, types of waste landfilled. Landfills for hazardous waste, for non-hazardous waste, and for inert waste.  | 7th week: Lecture: Waste incineration, incineration technologies. Negative effects on the environment caused by the incineration of waste. Operational conditions, technical requirements, and emission limit values for incineration and co-incineration plants.  |
| 8th week: 1st drawing week  |   |
| 9th week: Lecture: Life cycling analysis of materials recycling. Recyclable materials, municipal recycling facilities. Turning waste into a resource and build up a circular economy.  | 10th week: Lecture: Composting, anaerob digestion. Composting of municipal solid wastes. Treatment methods for biodegradable waste.  |
| 11th week: Lecture: Other waste treatment technologies: pyrolysis, gasification. Shipment of waste around the world.  | 12th week: Lecture: Green engineering and sustainable design aspects. Integrated waste management strategies.  |
| 13th week: Lecture: Processing and utilization of plastic and rubber wastes, degradable plastics and their significance in waste management.  | 14th week: Lecture: Waste from the chemical industry, their handling and utilization.  |
| 15th week: 2nd drawing week  |  |

Requirements

A, for a signature:

Attendance at lectures is recommended, but not compulsory. Active participation is requested and evaluated by the teacher in every class. There are no tests during the semester.

B, for a grade:

The course ends in a written exam covering the whole semester material and the students get a grade on the bases of its result. The minimum requirement for the end-term test is 60%.

The grade for the tests is given according to the following (score/grade):

0 – 59: fail (1); 60 – 69 points: pass (2); 70 – 79 points: satisfactory (3); 80 – 89 points: good (4); 90 – 100 points: excellent (5)

If the score of the end-term test is below 60, the student will be allowed to write it again and improve their grades.