The Hebrew University of Jerusalem

Syllabus

INTRODUCTION TO SOLID WASTE MANAGEMENT - 40622

Last update 31-08-2016

HU Credits: 2.5

Degree/Cycle: 2nd degree (Master)

Responsible Department: geography

Academic year: 0

Semester: 1st Semester

Teaching Languages: Hebrew

Campus: Mt. Scopus

Course/Module Coordinator: Dr. Nitsan Levy

Coordinator Email: nitsan.levy@mail.huji.ac.il

Coordinator Office Hours: schedule in advance

Teaching Staff:
Dr. Nitsan Levy

Course/Module description:
The course will give the student background and tools as for understanding processes in waste management in global, national and local levels. In the course of the studies, several issues will be overviewed: development of waste management tactics, managerial and economical approaches for regulation and control of waste management, method and alternatives of retention, collection, transport, treatment and disposal of waste, considerations as for waste disposal installations, life cycle, integrated waste management ,recycling, clean production, waste legislation in Israel and in the developed world, and transboundary waste management. Special attention will be given to the practical facet of waste management with case studies from Israel and the rest of the world.

Course/Module aims:
Broad overview of the discipline of solid waste management as a major issue of environmental management and basic tools for understanding various types of waste management policy.

Learning outcomes - On successful completion of this module, students should be able to:
Upon successful completion of this course, students should be able to: define basic concepts of waste management, distinguish between various activities, methods, policies and technologies, explain ways of operation of collection' treatment and disposal as well as waste management technologies, compare waste management policies, prepare arguments for support and negation of waste management policies, propose explanation to the main terms of waste management and present critical thinking as for different approaches of waste management.

Attendance requirements(%):
Mandatory presence in the study tour

Teaching arrangement and method of instruction: Lecture

Course/Module Content:
1 Definition of solid waste and types of waste
Environmental problems caused from solid waste
History of solid waste management in Israel and in the world

2 Quantity and composition of waste and their relations to socio-economic level Methods for retention, collection and transport of MSW
3 Methods for treatment of MSW 1: Sanitary landfilling
4 Methods for treatment of MSW 2: Separate treatment of wet and dry waste. Anaerobic digestion and thermic treatment of MSW
5 Methods for treatment of MSW 3: Integrated waste management
6 Reuse, recycling and recovery. Life cycle, clean production, C2G, C2C, SMM
7 Waste legislation and development of legislation in Israel and in the world
8 Tools for waste management (external costs, market based incentives, professional tools, legislation and others). Case studies: EU, Germany-Netherlands-Austria, US-Canada.
9 Policy alternatives for waste management and economics of waste in Israel and the world. North America in compare to Europe and the alternatives for Israel.
10 Hazardous waste management: management and policy principles in Israel and the world. Case studies from North America
11 Criteria and considerations for planning and siting waste disposal installations. Planning in Israel, and its development from the 1980 until now. Dynamics of NIMBY

12 Restoring waste disposal sites, trading pollution prevention rights – managerial, economical, global and local facets – examples from Israel and the world.
13 Transboundary waste management: EU, North America and Israel
14 Field trip for learning retention and collection methods, treatment and policy outcomes.

<u>Required Reading:</u>
Reading list:
Session 1:
Tammemagi, H. (1999). The waste crisis, landfills, incinerations, and the search for a sustainable future. New York, Oxford University Press. Chapters 1, 2, 3
Nissim, I., T. Shohat and Y. Inbar (2005). From dumping to sanitary landfills - solid waste management in Israel, Waste Management, 25(3): 323-327
Session 2:
Ministry of Environmental Protection (2014), National waste composition survey 2012-2013 (In Hebrew. Read abstract pp. 7-11)
http://www.sviva.gov.il/InfoServices/ReservoirInfo/DocLib2/Publications/P0701-P0800/P0749.pdf
Session 3:
Perl A. & Misgav A. (2000) Restoring landfill: Guidelines for open space works, City and Region research center, The Technion institute for R & D Ltd. (In Hebrew. Read first chapter)
Session 4:
Ostrem, K. M., K. Milirath and N. J. Themelis (2004). Combining anaerobic digestion and waste-to-energy, 12th North American Waste to Energy Conference (NAWTEC12), New York.

http://www.seas.columbia.edu/earth/wtert/sofos/ostrem-millrath-themelis_nawtec12_2004.pdf
Session 5:
Seadon, J. K., (2006). "Integrated waste management - Looking beyond the solid waste horizon." Waste Management, 26(12): 1327-1336
Session 6:
Guinee, J. B., R. Heijungs, G. Huppes, A. Zamagni, P. Masoni, R. Buonamici, T. Ekvall and T. Rydberg (2011). "Life Cycle assessment: past, present, and future." Environmental Science and Technology, 45: 90-96.
McGowan, A. H., (2014), Piles of Junk: Can Modern scrap business be sustainable. Environment, 56(2): 31-36
Ekvall, T., G. Assefa, A. Bjorklund, O. Eriksson and G. Finnveden, (2007). What life-cycle assessment does and does not do in assessments of waste management. Waste Management, 27: 989–996.
Clift, R., A. Doig and G. Finnveden (2000). "The Application of Life Cycle Assessment to Integrated Solid Waste Management: Part 1--Methodology." Process Safety and Environmental Protection 78(4): 279-287.
Session 7:
Legislation in the European Union: Read in The EU website of 3 main waste management directives: Easte framework Directive 2008/98/EC. IPPC (IED) Directive 2008/98/EC. Landfills Directive 1999/31/EC.
http://europa.eu/legislation_summaries/environment/waste_management/index_en.htm
Session 8:
EEA (2005). Market-based instruments for environmental policy in Europe. EEA Technical report No 8/2005. Copenhagen, EEA. Read Executive Summary, Chapters 1, 2, 3.1-3.4 and 3.5.8.
Avnimelech, Y. Ayalon, O. (2008), National priorities in Environmental quality in Israel. Vol. A: MSW and hazardous waste. Mosad Neeman, Technion, Haifa (In Hebrew. Read chapters 3.8, 3.9, and 4)
Eshet, T., M. G. Baron, M. Shechter and O. Ayalon, (2007). Measuring externalities of waste transfer stations in Israel using hedonic pricing. Waste Management, 27(5): 614-625.
Session 9:
Dijkgraaf, E. and H. R. J. Vollebergh (2004). Burn or bury? A social cost comparison of final waste disposal methods. Ecological Economics, 50: 233-247.
Svardlov, A., U. Marinov & D. Klein, (2005), Master plan for solid waste in Israel. Ministry of Environmental Protection. (In Hebrew)
http://www.sviva.gov.il/subjectsEnv/Waste/Policy/MasterPlanning/Pages/default.aspx

Session 10:
Fletcher, T. H. (2003). From Love Canal to environmental justice: the politics of hazardous waste on the Canada-U.S. border, Peterborough, Ontario, Broadview Press. Chapter 1.
Session 11:
Kontos, T. D., D. P. Komilis and C. P. Halvadakis (2005). Siting MSW landfills with a

spatial multiple criteria analysis methodology. Waste Management, 25(8): 818-832.
Session 12:
Plochl, C. and W. Wetzer (2008). Clean development mechanism: an incentive for waste management projects? Waste Management and Research, 26: 104-110.
Session 13:
EU Shipment of waste Directive 1013/2006 including last amendments. http://europa.eu/legislation_summaries/environment/waste_management/l11022_en.htm

Additional Reading Material:
Within required reading list

Course/Module evaluation:
End of year written/oral examination 100 %
Presentation 0 %
Participation in Tutorials 0 %
Project work 0 %
Assignments 0 %
Reports 0 %
Research project 0 %
Quizzes 0 %
Other 0 %

Additional information:
None