

COURSE DESCRIPTION CARD

Faculty of Civil Engineering and Environmental Science									
Field of study	Environmental Engineering							Degree level and programme type	Bachelor's degree
Specialization/ diploma path	-International School of Engineering							Study profile	Academic profile
Course name	Waste Management							Course code	19284212H/IS1S61049
								Course type	Obligatory
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	VI
	1	-	-	1	-	-	-	No. of ECTS credits	2
Entry requirements	Basic knowledge of mathematics, chemistry, water management and water protection								
Course objectives	Knowledge of basic principles of waste management practice. Practical skills for choosing the right waste disposal system, assessing strengths and weakness for each disposal system. Competence in decision making in the field of waste disposal. Practical outcome is ability to carry out engineering calculations for municipal landfill design.								
Course content	LECTURES: Principles of waste management; Characteristics of waste quantity and quality: waste sampling, characterization of waste stream, chemical and physical properties of waste; Municipal solid waste collection; Recycling, Composting of municipal waste: principles and methodology, Incineration, Landfilling: exploitation; leachate and biogas generation and collection, recultivation. PROJECT: Project of small municipal landfill with engineering calculations including waste balance, calculation of leachate generation, calculation of biogas emission, assessment of landfill gross and useful area, proposition of landfill monitoring.								
Teaching methods	case study analysis, discussion, technical calculations, project presentation								
Assessment method	Final project preparation with proper calculations, written test								
Symbol of learning outcome	Learning outcomes							Reference to the learning outcomes for the field of study	
LO1	Knowledge of rules and principles of waste management practices							IS1_W08 IS1_W11	
LO2	Knowledge of advantages and disadvantages of landfilling, composting and waste incineration							IS1_W07 IS1_W08	
LO3	Skills to describe and chose the right method and technology of waste disposal, knowledge of landfill project principles, ability to use computer tools for project preparation and presentation							IS1_W10 IS1_U10	
LO4	Skills to make an engineering calculations for municipal landfill design with assessment of leachate and biogas production							IS1_W08 IS1_U12	

LO5	Can use the different kinds of information related to waste management	IS1_U14	
LO6	Can objectively assess, use and analyze the information concerning waste management	IS1_U04	
Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed	
LO1	written test	L	
LO2	written test	L	
LO3	project preparation, project discussion	P	
LO4	correctness of calculation in project documentation	P	
LO5	project preparation, project discussion, observation of work during project	P	
LO6	correctness of calculation in project documentation, presentation of project	P	
Student workload (in hours)		No. of hours	
Calculation	participation in lectures	16	
	participation in project	16	
	project calculations and project realization	32	
	preparation for written test	8	
	preparation for project presentation	6	
	participation in student-teacher sessions related to the project/lectures	4	
	TOTAL:	80	
Quantitative indicators		HOURS	No. of ECTS credits
Student workload – activities that require direct teacher participation		36	1.5
Student workload – practical activities		58	2
Basic references	<ol style="list-style-type: none"> 1. Pichtel J. Waste Management Practises. Municipal, Hazardous, and Industrial. Second Edition. CRC Press. Taylor and Francis Group. 2014. ISBN: 978-1-4665-8518-8 2. Tchobanoglous G., Kreith F. Handbook of solid waste management. Second Edition. McGRAW-HILL. 2002 3. McBean E.A., Rovers F.A., Farguhar G.J. Solid Waste Landfill Engineering and Design. New Jersey 1995 		
Supplementary references	Carville M., Robinson H. Leachate treatment. Waste Management World. United Kingdom 2005.		
Organisational unit conducting the course	Department of Water Supply and Sewage Systems	Date of issuing the programme	
Author of the programme	dr hab. inż. Izabela Anna Talaaj, prof. PB	May 2022	

L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work, S – seminar