

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Industrial Waste-Solids Management		Code 1010135231010130332
Field of study Enviromental Engineering Extramural Second-	Profile of study (general academic, practical) (brak)	Year /Semester 2 / 3
Elective path/specialty Water Suply, Water Soil Protection	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: Second-cycle studies	Form of study (full-time,part-time) part-time	
No. of hours Lecture: 20 Classes: - Laboratory: - Project/seminars: 15		No. of credits 2
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art		ECTS distribution (number and %)
Responsible for subject / lecturer: Piotr Krajewski, PhD email: piotr.krajewski@put.poznan.pl tel. +48 61 665 3661 Faculty of Civil and Environmental Engineering ul. Piotrowo 5, 60-965 Poznań; tel.: (61) 6652413, 6652900		Responsible for subject / lecturer: Piotr Oleśkowicz-Popiel, PhD email: piotr.oleskowicz-popiel@put.poznan.pl tel. +48 61 665 3661 Faculty of Civil and Environmental Engineering ul. Piotrowo 5, 60-965 Poznań; tel.: (61) 6652413, 6652900
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Knowledge about chemistry, environmental biology, environmental biotechnology, ecology and general knowledge from environmental engineering.
2	Skills	Ability for searching valuable information. Reading research articles and reports with understanding. Ability to use existing knowledge and its application in a new perspective. Basic principles of working in a group and writing a project reports.
3	Social competencies	Awareness to constantly update and supplement knowledge and skills.
Assumptions and objectives of the course: The course is dealing with problems concerning industrial waste management and utilization. The objective of the course is to develop skill on industrial waste management planning according to the hazardous and toxic ingredients.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Student has structured and theoretically founded knowledge of the existing industrial waste management systems. - [K_W03, K_W04, K_W05, K_W07]		
2. Student has structured and theoretically founded knowledge in terms related to the generation of industrial waste. - [K_W03, K_W04, K_W05, K_W07]		
3. Student knows and understands the role of properly designed industrial waste management systems. - [K_W01, K_W03, K_W04, K_W05, K_W06, K_W07, K_W08]		
4. Student knows and understands the consequences of wrongly designed industrial waste management systems. - [K_W01, K_W03, K_W04, K_W05, K_W06, K_W07, K_W08]		
5. Student knows and understands the basic technologies used in industrial waste management systems - [K_W03, K_W04, K_W05, K_W07]		
6. Student knows the basics of multi-criteria assessment of industrial waste management systems. - [K_W01, K_W03, K_W04, K_W06, K_W07]		
Skills:		

1. Student is able to plan industrial waste management system in accordance with the demand in the region. - [K_U01,K_U02,K_U03, K_U05,K_U10, K_U13,K_U14, K_U15]
2. Student is able to design and explain the system of collection, transport and transfer of industrial waste. - [K_U01, K_U03, K_U10, K_U13, K_U14]
3. Student can describe the industrial waste treatment technologies and explain the associated processes. - [K_U01, K_U04, K_U10, K_U14]
4. Student can describe recycling technologies for important fractions of waste. - [K_U01, K_U04, K_U10, K_U14]
5. Student can describe the waste disposal technologies and explain the associated processes. - [K_U01, K_U04, K_U10, K_U14]
6. Student can describe important aspects related to resource use and emissions associated with the collection, treatment, recycling and disposal of waste, and describe their impact on the environment. - [K_U01, K_U04, K_U10, K_U14]
Social competencies:
1. Student understands the need for teamwork in solving theoretical and practical problems. - [K_K03]
2. Student understands the different roles in a teamwork and the need for information and knowledge exchange in a group work. - [K_K03, K_K04]
3. Student is aware of the need for sustainable development in waste management systems. - [K_K02, K_K07]
4. Student understands the need for a systematic deepening and broadening his/her competences. - [K_K01]

Assessment methods of study outcomes		
Examination of the knowledge gained from lectures. Evaluation of the work performed at project/seminars.		
Course description		
Basic concepts of industrial waste management: waste generation, the amount and composition, collection, recycling and reuse, waste disposal, waste management regulations, the impact of waste on the environment.		
Basic bibliography:		
1. 1. Christensen T.H. (eds) (2010): Solid Waste Technology & Management, John Wiley & Sons, Ltd, Chichester (ISBN: 978-1-405-17517-3).		
Additional bibliography:		
Result of average student's workload		
Activity	Time (working hours)	
1. Participation in lectures	30	
2. Participation in project work	30	
3. Consultation with the lecturer	3	
4. Preparation for exam	30	
Student's workload		
Source of workload	hours	ECTS
Total workload	20	1
Contact hours	20	1
Practical activities	30	0