

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Sewage and Waste Technology		Code 1010134281010135218
Field of study Environmental Engineering Extramural First-	Profile of study (general academic, practical) (brak)	Year /Semester 4 / 8
Elective path/specialty -	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) part-time	
No. of hours Lecture: 20 Classes: - Laboratory: 10 Project/seminars: 10		No. of credits 6
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 technical sciences Technical sciences		ECTS distribution (number and %) 6 100% 6 100%
Responsible for subject / lecturer: dr inż. Tymoteusz Jaroszyński email: tymoteusz.jaroszynski@put.poznan.pl tel. 616652436 Faculty of Civil and Environmental Engineering ul. Piotrowo 5 60-965 Poznań		Responsible for subject / lecturer: dr Piotr Krajewski email: piotr.krajewski@put.poznan.pl tel. 616652436 Faculty of Civil and Environmental Engineering ul. Piotrowo 5 60-965 Poznań
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic knowledge about chemistry, environmental biology, 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 waste management of solid wastes and their utilization. The objective of the course is to develop skill on waste management planning, waste segregation, mechanic-, thermal- and biological- treatment, and landfilling of waste.		
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 waste management systems - [KW07]		
Skills:		
1. Student is able to plan waste management system in accordance with the demand in the region - [K_U07]		
2. Student is able to design and explain the system of collection, transport and transfer of waste - [K_U01]		
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]		
Assessment methods of study outcomes		

<p>-Joint assessment from lectures and projects: - evaluation of the project report (30%) - presentation of the project (30%) - defending the project + general questions from waste management (30%) - activity (10%) - failure of on the above mentioned assessment components disqualifies for the entire course.</p>		
Course description		
<p>-Basic concepts of waste management: waste generation, the amount and composition, collection and segregation of waste, recycling and reuse, incineration, biological treatment (composting, biogas production), waste disposal, waste management regulations, the impact of waste on the environment. Projects: Students will be divided into groups of about 4-6 (depending on the number of students in groups) within which they will work on solving the waste management problem for specific town/city based on the knowledge acquired from the lectures and literature. Additionally, the following soft skills will be acquired: working in groups, sharing tasks, searching for valuable information, writing reports, presenting the results.</p>		
Basic bibliography:		
<p>1. Rosik-Dulewska Cz.: Podstawy gospodarki odpadami. Wydawnictwo naukowe PWN, Warszawa 2000 2. Kempa E.: Gospodarka odpadami miejskimi. Arkady, Warszawa 1983</p>		
Additional bibliography:		
<p>1. Oleszkiewicz J. : Eksploatacja składowiska odpadów. Lemprojekt s.c., Kraków 1999 2. Bilitewski B., Hardtle G., Marek K.: Podręcznik gospodarki odpadami. Wydawnictwo Seidel - Przywecki, Wyd. I, Warszawa 2003</p>		
Result of average student's workload		
Activity	Time (working hours)	
1. Lecture participation	20	
2. Laboratory participation	10	
3. Preparation for laboratory exercises	10	
4. Project participation	10	
5. Project preparation at home	30	
6. Project consultation with the instructor (Student is assumed to attend 5 consultations)	10	
7. Preparation for examination of laboratory and project exercises	20	
8. Preparation for lecture final examination and final exam attendance	40	
Student's workload		
Source of workload	hours	ECTS
Total workload	150	6
Contact hours	50	2
Practical activities	100	4