



### MODULE SPECIFICATION

Module code	
Module title in Polish	Zastosowania technologii bezwykopowych
Module title in English	Applications of Trenchless Techniques
Module running from the academic year	2016/2017

### A. MODULE IN THE CONTEXT OF THE PROGRAMME OF STUDY

Field of study	Environmental Engineering
Level of qualification	first cycle (first cycle, second cycle)
Programme type	academic (academic/practical)
Mode of study	full-time (full-time/part-time)
Specialism	Sanitary Pipelines and Systems, Water Supply, Treatment of Wastewater and Solid Waste
Organisational unit responsible for module delivery	Department of Piped Utility Systems
Module co-ordinator	Agata Zwierzchowska, PhD, Eng.
Approved by:	Prof. Andrzej Kuliczkowski, PhD hab., Eng.

### B. MODULE OVERVIEW

Module type	programme-specific module (core/programme-specific/elective HES*)
Module status	optional module (compulsory/optional)
Language of module delivery	<b>Polish/English</b>
Semester in the programme of study in which the module is taught	semester 6
Semester in the academic year in which the module is taught	summer semester (winter semester/summer semester)
Pre-requisites	None (module code/module title, where appropriate)
Examination required	No (Yes/No)
ECTS credits	3

\* elective HES – elective modules in the Humanities and Economic and Social Sciences

Mode of instruction	lectures	classes	laboratories	project	others
Total hours per semester	15				



### C. LEARNING OUTCOMES AND ASSESSMENT METHODS

<b>Module aims</b>	The aim of the module is to acquire knowledge as regards the selected problems of trenchless renovation of sewage pipelines, the possibilities of applying trenchless constructional techniques as well as vocabulary in English concerning trenchless technologies.
--------------------	--

Module outcome code	Module learning outcomes	Mode of instruction (l/c/lab/p/ others)	Corresponding programme outcome code	Corresponding discipline-specific outcome code
W_01	A student is knowledgeable about the properties of vitrified clay and plastic pipes applied in trenchless techniques (a student is also capable of comparing them).	I	IŚ_W01 IŚ_W06	T1A_W01 T1A_W02 T1A_W03 T1A_W04 T1A_W05 T1A_W07
W_02	A student knows the procedures in the case of renovation concerning sewage system with the use of trenchless techniques.	I	IŚ_W09	T1A_W03 T1A_W04 T1A_W05 T1A_W06 T1A_W07
W_03	A student knows realisation problems occurring in trenchless renovation of a sewage network.	I	IŚ_W15	T1A_W06
U_01	A student can plan appropriate repair and renovation activities.	I	IŚ_U16	T1A_U03 T1A_U05 T1A_U07 T1A_U08 T1A_U09 T1A_U10 T1A_U11 T1A_U13 T1A_U14 T1A_U15 T1A_U16
U_02	A student has mastered the ability of communicating in English together with the knowledge of the elements concerning technical language as regards trenchless techniques.	I	IŚ_U06	T1A_U01 T1A_U02 T1A_U03 T1A_U04 T1A_U05 T1A_U06
K_01	A student understands the necessity of passing knowledge on trenchless techniques to the society.	I	IŚ_K06	T1A_K06 T1A_K07
K_02	A student is aware of the need to raise professional and personal competences.	I	IŚ_K03	T1A_K01 T1A_K02 T1A_K04

#### Module content:

1. Topics to be covered in the lectures
2. Topics to be covered in the classes
3. Topics to be covered in the laboratories

No.	Topics	Module outcome code
1	Comparative analysis of properties of vitrified clay and plastic pipes used in trenchless techniques.	W_01 U_02
2	The strategy for renovation of sewerage system using trenchless techniques.	W_02 U_01 U_02 K_01 K_02
3	Surveying, designing and realization problems of trenchless renovation of sewage systems.	W_03 U_02
4	Future technologies of trenchless renovation of the pipelines which have been earlier	W_03



	trenchlessly renovated	U_02
5	Presentation of several films about new trenchless techniques from different countries.	W_03 U_02
6	Soil displacement techniques - application area.	W_03 U_02
7	Soil removal techniques - application area.	W_03 U_02
8	Aspects of environmental protection in trenchless pipe laying.	W_03 U_02 K_01 K_02

### Assessment methods

Module outcome code	Assessment methods <i>(Method of assessment; for module skills – reference to specific project, laboratory and similar tasks)</i>
W_01	A test
W_02	A test
W_03	A test
U_01	A test
U_02	A test
K_01	A participation in discussion during the lecture
K_02	A participation in discussion during the lecture

### D. STUDENT LEARNING ACTIVITIES

ECTS summary		
	Type of learning activity	Study time/ credits
1	Contact hours: participation in lectures	<b>15</b>
2	Contact hours: participation in classes	
3	Contact hours: participation in laboratories	
4	Contact hours: attendance at office hours (2-3 appointments per semester)	<b>3</b>
5	Contact hours: participation in project-based classes	
6	Contact hours: meetings with a project module leader	
7	Contact hours: attendance at an examination	
8		
9	<b>Number of contact hours</b>	<b>18</b> <i>(total)</i>
10	<b>Number of ECTS credits for contact hours</b> <i>(1 ECTS credit = 25-30 hours of study time)</i>	<b>0.72</b>
11	Private study hours: background reading for lectures	<b>37</b>
12	Private study hours: preparation for classes	
13	Private study hours: preparation for tests	<b>20</b>
14	Private study hours: preparation for laboratories	
15	Private study hours: writing reports	
16	Private study hours: preparation for a final test in laboratories	



17	Private study hours: preparation of a project/a design specification	
18	Private study hours: preparation for an examination	
19		
20	<b>Number of private study hours</b>	<b>57</b> <i>(total)</i>
21	<b>Number of ECTS credits for private study hours</b> <i>(1 ECTS credit = 25-30 hours of study time)</i>	<b>2.28</b>
22	<b>Total study time</b>	<b>3</b>
23	<b>Total ECTS credits for the module</b> <i>(1 ECTS credit = 25-30 hours of study time)</i>	
24	<b>Number of practice-based hours</b> <i>Total practice-based hours</i>	
25	<b>Number of ECTS credits for practice-based hours</b> <i>(1 ECTS credit = 25-30 hours of study time)</i>	

### E. READING LIST

References	1. Stein D.: Trenchless Technology for Installation of Cables and Pipelines. Stein and Partner. Germany, 2005
Module website	