



MODULE SPECIFICATION

Module code	
Module title in Polish	Infrastruktura podziemna miast
Module title in English	Urban Underground Infrastructure (UUI)
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	Urszula Kubicka, PhD, Eng.
Approved by:	Prof. Andrzej Kuliczowski, 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	Polish/English
Semester in the programme of study in which the module is taught	semester 4
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	1

* 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

Module aims	The aim of the module is to familiarise students with the issue of setting the network urban infrastructure in multi-duct tunnels as well as with constructional solutions of underground passages.
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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 knows the networks of underground infrastructure and general principles of setting network in soil.	l	IS_W09	T1A_W03 T1A_W04 T1A_W05 T1A_W06 T1A_W07
W_02	A student has knowledge on the structure of multi-duct tunnels. The principles of placing network inside the tunnel as well as equipping it.	l	IS_W09	T1A_W03 T1A_W04 T1A_W05 T1A_W06 T1A_W07
W_03	A student is familiar with the principles of constructing underground passages for pedestrians as well as dimensioning a passageway for an underground passage.	l	IS_W09	T1A_W03 T1A_W04 T1A_W05 T1A_W06 T1A_W07
W_04	A student knows the methods of leading telecommunication cables in the exploited channels.	l	IS_W09	T1A_W03 T1A_W04 T1A_W05 T1A_W06 T1A_W07
U_01	A student can set the networks of underground infrastructure in soil and in the multi-duct tunnel; a student can also select a material and constructional solution for the tunnel.	l	IS_U10 IS_U15 IS_U16	T1A_U02 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 can select the geometry of underground passage for pedestrians; in addition, a student can design a passageway.	l	IS_U10 IS_U16	T1A_U02 T1A_U03 T1A_U05 T1A_U07 T1A_U08 T1A_U09 T1A_U10 T1A_U11 T1A_U13 T1A_U14 T1A_U15 T1A_U16
U_03	A student is able to characterise the methods of leading telecommunication cables in a sewage network.	l	IS_U16	T1A_U03 T1A_U05 T1A_U07 T1A_U08 T1A_U09 T1A_U10 T1A_U11 T1A_U13 T1A_U14 T1A_U15 T1A_U16
K_01	A student is aware of the necessity of raising his/her competences and broadening his/her professional knowledge.	l	IS_K03	T1A_K01 T1A_K02 T1A_K04

Module content:

1. Topics to be covered in the lectures

No.	Topics	Module outcome code
1	The types of underground infrastructure network and the principles of positioning it in the soil.	W_01 U_01
2-3	The principles of determining the geometry of multi-duct tunnels, the types of structures and	W_01 W_02



	materials used to build multi-duct tunnels. The principles of mutual positioning of tunnels and the adjacent infrastructure.	U_01 K_01
4-5	The principles of placing network inside multi-duct tunnels drawing attention to the required distances. Tunnel equipment.	W_02 U_01
6	Structure elements of an underground passage for pedestrians. The principles of selecting the geometry of passageways for underground passages.	W_03 U_02
7-8	The methods of leading telecommunication and optical fibre cords in the sewage network. The place of leading cables, casing types. The characteristics of the selected assembly techniques.	W_04 U_03 K_01

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
W_04	A test
U_01	A test
U_02	A test
U_03	A test
K_01	A test. Discussion during the lecture.

D. STUDENT LEARNING ACTIVITIES

ECTS summary		
	Type of learning activity	Study time/ credits
1	Contact hours: participation in lectures	15
2	Contact hours: participation in classes	
3	Contact hours: participation in laboratories	
4	Contact hours: attendance at office hours (2-3 appointments per semester)	2
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	Number of contact hours	17 <i>(total)</i>
10	Number of ECTS credits for contact hours <i>(1 ECTS credit = 25-30 hours of study time)</i>	0.68
11	Private study hours: background reading for lectures	8
12	Private study hours: preparation for classes	
13	Private study hours: preparation for tests	
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	Number of private study hours	8 <i>(total)</i>
21	Number of ECTS credits for private study hours <i>(1 ECTS credit =25-30 hours of study time)</i>	0.32
22	Total study time	25
23	Total ECTS credits for the module <i>(1 ECTS credit =25-30 hours of study time)</i>	1
24	Number of practice-based hours <i>Total practice-based hours</i>	
25	Number of ECTS credits for practice-based hours <i>(1 ECTS credit =25-30 hours of study time)</i>	

E. READING LIST

References	<ol style="list-style-type: none">1. Levy M., Panchyk R.: Engineering the City: How Infrastructure Works, Projects and Principles for Beginners, Chicago Review Press, October 1, 2000;2. Penn M.R., Parker P.J.: Introduction to Infrastructure: An Introduction to Civil and Environmental Engineering. Wiley; 1 edition, December 13, 2011;3. Sinha R.S.: Underground Structures: Design and Instrumentation, Elsevier Science, November 12, 2012;4. Zhao J., Shirlaw J.N.: Tunnels & Underground Structures, CRC Press, January 1, 2000
Module website	