



MODULE SPECIFICATION

Module code	
Module title in Polish	Eksploatacja wodociągów i kanalizacji
Module title in English	Maintenance (MRO) of Water Supply and Sewage Pipelines
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 System; Water Supply, Treatment of Wastewater and Solid Waste
Organisational unit responsible for module delivery	Department of Piped Utility Systems
Module co-ordinator	Justyna Lisowska, PhD, Eng.
Approved by:	Prof. Andrzej Kulickowski, 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 7
Semester in the academic year in which the module is taught	winter semester (winter semester/summer semester)
Pre-requisites	Water Supply Pipelines, Sewage Systems (module code/module title, where appropriate)
Examination required	Yes (Yes/No)
ECTS credits	2

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

Mode of instruction	lectures	classes	laboratories	project	others
Total hours per semester	30				



C. LEARNING OUTCOMES AND ASSESSMENT METHODS

Module aims	The aim of the module is to acquaint students with the knowledge on the exploitation and utilisation of pipeline as well as sewage networks.
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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 can define basic notions connected with water supply pipelines and sewage systems maintenance.	I	IS_W15	T1A_W06
W_02	A student knows basic principles of safe conducting maintenance works.	I	IS_W09	T1A_W03 T1A_W04 T1A_W05 T1A_W06 T1A_W07
W_03	A student differentiates the types of commissioning as water supply pipelines and sewage systems.	I	IS_W09	T1A_W03 T1A_W04 T1A_W05 T1A_W06 T1A_W07
W_04	A student can identify the causes of damage on water supply pipelines and sewage systems	I	IS_W09	T1A_W03 T1A_W04 T1A_W05 T1A_W06 T1A_W07
W_05	A student can describe the impact of damage to the environment.	I	IS_W09	T1A_W03 T1A_W04 T1A_W05 T1A_W06 T1A_W07
W_06	A student knows classification of damage as well as failures observed during the TV pipeline inspection.	I	IS_W09	T1A_W03 T1A_W04 T1A_W05 T1A_W06 T1A_W07
W_07	A student differentiate methods of unblocking and cleaning of pipelines.	I	IS_W09	T1A_W03 T1A_W04 T1A_W05 T1A_W06 T1A_W07
U_01	A student can define basic maintenance activities.	I	IS_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 can formulates the basic causes of damages.	I	IS_U16	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 can make provision the effects of develop pipe damage	I	IŚ_U25	T1A_U09 T1A_U10
U_04	A student can classify damages as well as failures observed during the TV pipeline inspection.	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_05	A student can apply the appropriate method of flushing or cleaning the water supply pipelines and sewage systems		IŚ_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 can work individually on the assigned project.	I	IŚ_K02	T1A_K02 T1A_K05
K_02	A student exercise caution in selection of appropriate methods for flow control in the water supply pipelines and sewage systems.	I	IŚ_K05	T1A_K03 T1A_K04
K_03	A student is critical of classification of damage as well as failures observed on the water supply pipelines and sewage systems.	I	IŚ_K09	T1A_K02
K_04	A student is responsibility for the selection of appropriate maintenance activities.	I	IS_K08	T1A_K05

Module content:

1. Topics to be covered in the lectures

No.	Topics	Module outcome code
1	The fundamentals of water supply pipelines and sewage systems maintenance; maintenance definitions; the principles of safe maintenance works.	W_01 W_02 U_01 K_04
2	The requirements concerning acceptance of new water supply pipelines and sewage systems	W_01 W_03 U_04 K_01 K_03
3	The causes of failures concerning water supply pipelines and sewage systems. The types and characteristics of failures as well as their impact on the environment.	W_04 W_05 U_02 U_03 K_03 K_04
4	Water and sewage emergency service. Protection and removing water supply pipelines and sewage systems failures. The methods of flow stopping in pipelines	W_01 W_02 W_05



	and bypassing.	U_01 U_02 U_03 K_01 K_04
5	Classification of damages as well as failures observed during the TV pipeline inspection.	W_01 W_06 U_01 U_04 K_01 K_03
6	The methods of water supply pipelines cleaning. The methods of unblocking and cleaning of sewage systems.	W_02 W_07 U_01 U_05 K_01 K_04

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
W_05	A test
W_06	A test
W_07	A test
U_01	A test
U_02	A test
U_03	A test
U_04	A test
U_05	A test
K_01	A test. Observation of the student work during lectures
K_02	A test. Observation of the student work during lectures
K_03	A test. Observation of the student work during lectures
K_04	A test. Observation of the student work during lectures

D. STUDENT LEARNING ACTIVITIES

ECTS summary		
	Type of learning activity	Study time/credits
1	Contact hours: participation in lectures	30
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	32 <i>(sum)</i>
10	Number of ECTS credits for contact hours <i>(1 ECTS credit =25-30 hours of study time)</i>	1.28
11	Private study hours: background reading for lectures	12
12	Private study hours: preparation for classes	
13	Private study hours: preparation for tests	6
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	18 <i>(sum)</i>
21	Number of ECTS credits for private study hours <i>(1 ECTS credit =25-30 hours of study time)</i>	0.72
22	Total study time	50
23	Total ECTS credits for the module <i>(1 ECTS credit =25-30 hours of study time)</i>	2
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. McIntre, P.: Integrated risk management to protect drinking water and sanitation services facing natural disasters, IRC, 2008, 2. Pan American Health Organization: The challenge in disaster reduction for the water and sanitation sector: improving quality of life by reducing vulnerabilities, Washington, DC: PAHO, 2006, 3. Pollard S.J.T.: Risk management for water and wastewater utilities, IWA Publishing, 2008, 4. Fair G.: Water and Wastewater Engineering: Water Supply and Wastewater Removal, 3rd Edition, November 2010,
Module website	