



### MODULE SPECIFICATION

Module code	
Module title in Polish	Kanalizacja ciśnieniowa i podciśnieniowa
Module title in English	Pressurised and Vacuum 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 Systems
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	English
Semester in the programme of study in which the module is taught	semester 5
Semester in the academic year in which the module is taught	winter 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

<b>Module aims</b>	The aim of the module is to familiarise students with the structure and maintenance of pressurised and vacuum sewage systems.
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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 is knowledgeable about the structure as well as the principle of operation as regards pressurised and vacuum sewage pipelines.	l	IS_W01	T1A_W01 T1A_W02
W_02	A student knows materials and the methods of joining pressurised pipes of external network.	l	IS_W06	T1A_W03 T1A_W04 T1A_W05 T1A_W07
W_03	A student knows the conditions of pressurised and vacuum sewage systems maintenance.	l	IS_W09	T1A_K03 T1A_W04 T1A_W05 T1A_W06 T1A_W07
W_04	A student is familiar with the devices and fittings applied in pressurised and vacuum sewage systems.	l	IS_W09	T1A_K03 T1A_W04 T1A_W05 T1A_W06 T1A_W07
U_01	A student can obtain information from the literature on the subject, integrate the obtained information, interpret it, draw conclusions, and justify his/her opinions.	l	IS_U02	T1A_U01 T1A_U05 T1A_U07
U_02	A student can select appropriate materials for the designed elements of sewage system.	l	IS_U15	T1A_U07 T1A_U10 T1A_U14 T1A_U15
K_01	A student is aware of the responsibility for his/her own work; a student is also ready to comply with the principles of teamwork and bear responsibility for the realised project tasks.	l	IS_K05	T1A_K03 T1A_K04
K_02	A student understands the necessity of technological progress and implementing new technical solutions in environmental engineering.	l	IS_K09	T1A_K02

#### Module content:

1. Topics to be covered in the lectures

No.	Topics	Module outcome code
1.	The principle of operation of pressurised sewage systems (its origin and applications).	W_01 U_01 K_02
2/3	Comparing gravitational and pressurised sewage removal systems.	W_01 U_01
4/5	Devices and fittings applied in pressurised and vacuum sewage systems.	W_04 U_02 K_01
6/7	Pressurised and vacuum ducts/cords (construction materials of pipes, the methods of joining and laying them in ground).	W_01 W_02 K_01



8.	The principle of maintenance of pressurised and vacuum sewage systems.	W_03 U_01 K_02
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### 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
K_01	A test. Observation of students during the lectures.
K_02	A test. Observation of students during lectures. Discussion during the lectures.

### 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	<b>Number of contact hours</b>	<b>17</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>0.68</b>
11	Private study hours: background reading for lectures	4
12	Private study hours: preparation for classes	
13	Private study hours: preparation for tests	4
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>8</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>0.32</b>
22	<b>Total study time</b>	<b>25</b>
23	<b>Total ECTS credits for the module</b> <i>(1 ECTS credit =25-30 hours of study time)</i>	<b>1</b>
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	<ol style="list-style-type: none"><li>1. Mohinder L. Nayyar P.E.:Piping Handbook, 7th edition, McGraw-Hill Education, 2000</li><li>2. PSS Handbook. ITT Water &amp; Wastewater AB, 2010, Sweden</li><li>3. <a href="#">Miszta-Kruk K.</a>: Reliability and failure rate analysis of pressure, vacuum and gravity sewer systems based on operating data, <a href="#">Engineering Failure Analysis</a>, Elsevier, <a href="#">Volume 61</a>, March 2016, Pages 37–45</li></ol>
Module website	