



### MODULE SPECIFICATION

Module code	
Module title in Polish	Kanalizacja 2
Module title in English	Sewage Systems 2
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	Emilia Kuliczowska, PhD hab., Eng.
Approved by:	prof. Andrzej Kuliczowski, PhD hab., Eng.

### B. MODULE OVERVIEW

Module type	core 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	Hydraulics, Sewage Pipelines 1 (module code/module title, where appropriate)
Examination required	Yes (Yes/No)
ECTS credits	4

\* 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			30	



### C. LEARNING OUTCOMES AND ASSESSMENT METHODS

<b>Module aims</b>	The aim of the module is to acquaint student with particular stages accompanying the construction of gravitational channel in trenches as well as designing drainage sewage system with special objects accompanying it.
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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 particular stages accompanying the construction of gravitational channels in trenches, the methods of conducting trenches as well as equipment types.	l	IŚ_W09	T1A_W03 T1A_W04 T1A_W05 T1A_W06 T1A_W07
W_02	A student knows the methods of trench drainage as well as the methods of protecting trench walls.	l	IŚ_W09 IŚ_W15	T1A_W03 T1A_W04 T1A_W05 T1A_W06 T1A_W07
W_03	A student knows foundation methods as well as making the structures of sewage ducts.	l	IŚ_W11	T1A_W03 T1A_W04 T1A_W05
U_01	A student can make calculations of the values concerning the flow of rain waste; a student can also design an appropriate cross section and material of the drain.	p	IŚ_U12 IŚ_U15	T1A_U07 T1A_U08 T1A_U09 T1A_U10 T1A_U14 T1A_U15
U_02	A student can make calculations and design gravitational network of wastewater system.	p	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_03	A student can make calculations and design the selected special objects on the network.	p	IŚ_U12 IŚ_U15 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 task.	p	IŚ_K01	T1A_K03
K_02	A student is responsible for the reliability of the obtained project results and their interpretation.	p	IŚ_K02	T1A_K02 T1A_K05

### Module content:

1. Topics to be covered in the lectures

No.	Topics to be covered in the lectures	Module outcome code
1.	Preparatory activities (including routing). Making an trench.	W_01
2.	Reinforcing trench walls.	W_02
3.	The methods of trench drainage.	W_02
4.	Making a bedding under the construction channel.	W_03
5.	Making structures from semi-products.	W_03
6.	Making monolithic structures.	W_03
7.	Backfilling of the trench and its practical completion inspection on finishing construction.	W_01

2. Topics to be covered in the classes

No.	Topics to be covered in the classes	Module outcome code
1-2	Designing a system of rainwater drains on the assigned topographic plan.	W_01 U_01 U_02
3-6	The division of the drainage area into partial surfaces according to the direction of flow of wastewater (together with calculating their height).	W_01 W_02 U_01 U_02
7-18	Calculating the values of flows in channels; selecting diameters, decreases and rates with the method of boundary rains intensity.	W_01 W_02 U_01 U_02
19-22	Designing the submerging of the network as well as reinforcement.	W_02 U_01
23-25	Designing a storage reservoir.	U_01 U_02 U_03
26-30	Designing a cascade chamber.	U_01 U_02 U_03 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	An exam and a project
W_02	An exam and a project
W_03	An exam and a project
U_01	An exam and a project



U_02	An exam and a project
K_01	An exam and a project. Observation of the students work during the classes
K_02	An exam and a project. Observation of the students work during the classes

### 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)	3
5	Contact hours: participation in project-based classes	30
6	Contact hours: meetings with a project module leader	3
7	Contact hours: attendance at an examination	2
8		
9	<b>Number of contact hours</b>	<b>53</b> (sum)
10	<b>Number of ECTS credits for contact hours</b> <i>(1 ECTS credit = 25-30 hours of study time)</i>	<b>2.12</b>
11	Private study hours: background reading for lectures	10
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	27
18	Private study hours: preparation for an examination	10
19		
20	<b>Number of private study hours</b>	<b>47</b> (sum)
21	<b>Number of ECTS credits for private study hours</b> <i>(1 ECTS credit = 25-30 hours of study time)</i>	<b>1.88</b>
22	<b>Total study time</b>	<b>100</b>
23	<b>Total ECTS credits for the module</b> <i>(1 ECTS credit = 25-30 hours of study time)</i>	<b>4</b>
24	<b>Number of practice-based hours</b> <i>Total practice-based hours</i>	<b>60</b>
25	<b>Number of ECTS credits for practice-based hours</b> <i>(1 ECTS credit = 25-30 hours of study time)</i>	<b>2.4</b>

### E. READING LIST

References	<ol style="list-style-type: none"> <li>Mohinder L. Nayyar: Piping Handbook, 7th Edition, McGraw-Hill Education, 1999, p. 2528,</li> <li>Bizier P.: Gravity Sanitary System Design and Construction, 2nd Edition, American Society of Civil Engineering, 2007, p. 422</li> </ol>
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# Politechnika Świętokrzyska

## WYDZIAŁ INŻYNIERII ŚRODOWISKA, GEOMATYKI I ENERGETYKI

	3. Hoo R.: A guide to sewer selection and installation, 1st Edition, IndahWater, 2006, p. 168
Module website	