



MODULE SPECIFICATION

Module code	
Module title in Polish	Budownictwo i konstrukcje inżynierskie
Module title in English	Civil Engineering: Engineering Structures
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	core module (core/programme-specific/elective HES*)
Module status	compulsory module (compulsory/optional)
Language of module delivery	Polish/English
Semester in the programme of study in which the module is taught	semester 3
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	Yes (Yes/No)
ECTS credits	5

* 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			45	



C. LEARNING OUTCOMES AND ASSESSMENT METHODS

Module aims	The aims of the module are as follows: familiarising students with the types of such construction elements as roofs, ceilings, walls, stairs, and foundations as regards fundamental notions, types, and tasks; acquainting students with knowledge concerning the methods of dimensioning underground cords as well as the property and durability of pipes.
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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 basic construction elements of buildings, e.g. roofs, ceilings, bearing walls, foundations, and stairs.	l/p	IS_W01 IS_W02 IS_W03	T1A_W01 T1A_W02 T1A_W07
W_02	A student is knowledgeable about the applied anti-moisture protections, finishing materials as well as window and door frames.	l/p	IS_W02 IS_W03	T1A_W02 T1A_W07
W_03	A student is familiar with the principles of installing exhaust and ventilation chimneys out of the building.	l/p	IS_W02 IS_W03	T1A_W02 T1A_W07
W_04	A student has knowledge on the principles of designing a detached house.	l/p	IS_W02 IS_W05 IS_W06	T1A_W02 T1A_W03 T1A_W04 T1A_W05 T1A_W07
W_05	A student knows the types of loads interacting with piped systems arranged in the ground. Moreover, a student knows the methods of constructional dimensioning as regards underground networks.	l/p	IS_W01 IS_W05	T1A_W01 T1A_W02 T1A_W05 T1A_W07
W_06	A student knows constructional and material solutions of cords applied to build the network of underground infrastructure.	l/p	IS_W02 IS_W06	T1A_W02 T1A_W03 T1A_W04 T1A_W05 T1A_W07
W_07	A student understands the external and internal channel hazards which have an impact on the durability of underground structures.	l	IS_W07	T1A_W01 T1A_W03 T1A_W08
U_01	A student can design a detached house and select appropriate material and constructional solutions.	l/p	IS_U03 IS_U04 IS_U14 IS_U15	T1A_U02 T1A_U03 T1A_U07 T1A_U08 T1A_U09 T1A_U10 T1A_U14 T1A_U15
U_02	A student can design the structures of a sewer.	l/p	IS_U01 IS_U03 IS_U04 IS_U14 IS_U15	T1A_U02 T1A_U03 T1A_U07 T1A_U08 T1A_U09 T1A_U10 T1A_U14 T1A_U15
K_01	A student can independently work on a design task.	p	IS_K01	T1A_K03
K_02	A student is aware of the necessity of reliable completion of a design task.	p	IS_K02	T1A_K02 T1A_K05
K_03	A student can formulate appropriate conclusions concerning a design task.	p	IS_K02	T1A_K02 T1A_K05

Module content:

1. Topics to be covered in the lectures

No.	Topics	Module
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		outcome code
1-2	Roofs (their types, functions, and structures). The types of roofings. The inclines of roofs and drainage systems. Ceilings (their types and division). The characteristics of operation concerning rib and slab ceilings. Ventilated and non-ventilated flat roofs.	W_01 W_04 U_01
3-4	Stairs in buildings. Constructional diagrams of stairs. The principles of dimensioning steps, courses, and landings. Constructional and finishing materials. Structure foundations. Walls in buildings. Setting out buildings and the principles of making trenches for foundations.	W_01 W_04 U_01
5-6	Finishing works and materials in civil engineering. Plasters, floorboards, ceilings, tiling, wallpapers, paints, and varnishes. Sanitary fittings. Window and door frames.	W_02 W_04 U_01
7	Ventilation and exhaust ducts.	W_03 W_04 U_01
8	The types of external and internal loads interacting with the cords of underground infrastructure. Determining the most undesirable loads.	W_05 U_02
9-10	The principles of dimensioning pipes with the use of the ATV A 127 method. The methods of building in piped systems. The methods of providing foundation for the structures of underground networks. The distribution of the concentration of stresses in the trench.	W_05 U_02
11	The fundamentals of principles of designing pipes given on the basis of the Mollin method.	W_05
12-13	The properties, possibilities of application, and characteristics of cords concerning underground infrastructure made from concrete, reinforced concrete, PRC, stoneware, basalt, GRP, cast iron, steel, and plastics (their advantages and disadvantages and connection methods). The selected strength parameters of pipes.	W_06 U_02
15	The characteristics of external and internal channel factors which have an impact on the durability of piped systems.	W_07

2. Topics to be covered in the classes

No.	Topics	Module outcome code
1-2	Providing students with the norms concerning a design of a detached house. Completing a project concerning wall thickness on the basis of thermal calculations. Completing the positioning of rooms in a building in the form of a projection of a ground floor.	W_01 W_02 U_01 K_01
3	Making a projection of building foundations.	W_01 W_04 U_01 K_01
4-5	Making a projection of building attic. Making a plot development plan.	W_01 W_03 W_04 U_01 K_01
6-7	Making a vertical section of a building.	W_04 U_01 K_01
8	Making static calculations of the selected constructional elements.	W_04 U_01 K_02
9-10	Explaining the principles of selecting load bearing capacity for the structure of a sewage system made from concrete, reinforced concrete, and stoneware pipes. Determining fixed and variable loads.	W_05 W_06 U_02 K_01
11-12	Determining the coefficients of stress distribution in a narrow-space trench in the zone above the structure and nearby the structure. Making a diagram of providing foundation for the channel structure and determining relative elevation.	W_05 U_02 K_02
13-14	Determining the value of forces from vertical load, horizontal thrust, structure weight, and sewage filling. Determining summary interaction. Accepting the coefficients of horizontal thrust and foundation.	W_05 U_02 K_02 K_03



15	Making a cross section through the trench. Formulating conclusions.	W_06 U_02 K_03
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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	An examination and a project
W_02	An examination and a project
W_03	An examination and a project
W_04	An examination and a project
W_05	An examination and a project
W_06	An examination and a project
W_07	An examination
U_01	An examination and a project
U_02	An examination and a project
K_01	A project. Observation of student work during the classes
K_02	Observation of student work during the classes
K_03	A project. Observation of student 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)	6
5	Contact hours: participation in project-based classes	45
6	Contact hours: meetings with a project module leader	15
7	Contact hours: attendance at an examination	4
8		
9	Number of contact hours	85 <i>(total)</i>
10	Number of ECTS credits for contact hours <i>(1 ECTS credit = 25-30 hours of study time)</i>	3.4
11	Private study hours: background reading for lectures	5
12	Private study hours: preparation for classes	
13	Private study hours: preparation for tests	5
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	15



18	Private study hours: preparation for an examination	15
19		
20	Number of private study hours	40 <i>(total)</i>
21	Number of ECTS credits for private study hours <i>(1 ECTS credit = 25-30 hours of study time)</i>	1.6
22	Total study time	125
23	Total ECTS credits for the module <i>(1 ECTS credit = 25-30 hours of study time)</i>	5
24	Number of practice-based hours <i>Total practice-based hours</i>	75
25	Number of ECTS credits for practice-based hours <i>(1 ECTS credit = 25-30 hours of study time)</i>	3.0

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. Lindeburg M.R. Civil Engineering Reference Manual for the PE Exam, 15th Ed. Professional Publications, Inc.; Fifteenth Edition, New edition, November 20, 2015;3. Menon S.: Pipeline Planning and Construction Field Manual. Gulf Professional Publishing; 1 edition, May 26, 2011;4. Penn M.R. , Parker P.J.: Introduction to Infrastructure: An Introduction to Civil and Environmental Engineering. Wiley; 1 edition, December 13, 2011
Module website	