

MODULE SPECIFICATION

Module code	
Module title in Polish	Fundamentowanie
Module title in English	Foundation Engineering
Module running from the academic year	2016/2017

A. MODULE IN THE CONTEXT OF THE PROGRAMME OF STUDY

Field of study	Civil Engineering
Level of qualification	First cycle <i>(first cycle, second cycle)</i>
Studies profile	Academic <i>(academic/practical)</i>
Mode of study	Full-time <i>(full-time / part-time)</i>
Specialism	
Organisational unit responsible for module delivery	The Department of Geotechnical and Hydraulic Engineering
Module co-ordinator	Tomasz Kozłowski, PhD hab., Eng.
Approved by	Marek Iwański, Professor

B. MODULE OVERVIEW

Module type	Core module <i>(core/programme-specific/elective HES*)</i>
Module status	Compulsory module <i>(compulsory / non-compulsory)</i>
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 <i>(winter / summer)</i>
Pre-requisites	None <i>(module code/module title, where appropriate)</i>
Examination required	Yes <i>(yes / no)</i>
ECTS credits	4

Mode of instruction	lectures	classes	laboratories	project	others
Total hours per semester	30			15	

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

C. LEARNING OUTCOMES AND ASSESSMENT METHODS

Module aims	The aim of the module is to familiarise students with the basics of foundation engineering and geotechnics, i.e. preparing and analysing geotechnical documentation, designing direct foundations, designing pole foundations, designing retaining walls, and the methods of reinforcing substratum.
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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 types of soil conditions and the categories of a building object.	l	B_W03 B_W08 B_W11	T1A_W02 T1A_W03 T1A_W04 T1A_W07 T1A_W08
W_02	A student has general knowledge on the methods of foundation in various soil conditions.	l	B_W11	T1A_W04
W_03	A student has knowledge on the types of direct foundations as well as the principles of geotechnical and constructional dimensioning them.	l/p	B_W08 B_W09 B_W10 B_W13	T1A_W02 T1A_W03 T1A_W04 T1A_W05 T1A_W06 T1A_W07 T1A_W08
W_04	A student has knowledge on the types of piles and the principles of designing pile foundations.	l/p	B_W08 B_W09 B_W10 B_W13	T1A_W02 T1A_W03 T1A_W04 T1A_W05 T1A_W06 T1A_W07 T1A_W08
W_05	A student has knowledge on foundations with the use of caissons and wells.	l	B_W10 B_W13	T1A_W02 T1A_W04 T1A_W05 T1A_W06 T1A_W07 T1A_W08
W_06	A student is knowledgeable about the types of retaining walls (together with the principles of dimensioning them).	l	B_W08 B_W09 B_W10 B_W13	T1A_W02 T1A_W03 T1A_W04 T1A_W05 T1A_W06 T1A_W07 T1A_W08
W_07	A student has knowledge on the methods of reinforcing substratum.	l	B_W11 B_W13	T1A_W02 T1A_W04 T1A_W06 T1A_W08
U_01	A student can prepare geotechnical documentation.	p	B_U03 B_U12 B_U14	T1A_U01 T1A_U02 T1A_U03 T1A_U04 T1A_U05 T1A_U07 T1A_U08

				T1A_U11 T1A_U14 T1A_U15 T1A_U16
U_02	A student can select an appropriate foundation method depending on water and soil conditions.	I/p	B_U03 B_U15 B_U16	T1A_U01 T1A_U02 T1A_U03 T1A_U05 T1A_U07 T1A_U08 T1A_U11 T1A_U14 T1A_U16
U_03	A student can design direct foundations in complex load systems.	I/p	B_U02 B_U03 B_U12 B_U13 B_U16	T1A_U01 T1A_U02 T1A_U03 T1A_U04 T1A_U05 T1A_U07 T1A_U08 T1A_U11 T1A_U13 T1A_U14 T1A_U15 T1A_U16
U_04	A student can make calculations concerning foundation subsidence.	I/p	B_U02 B_U03 B_U12 B_U16	T1A_U01 T1A_U02 T1A_U03 T1A_U05 T1A_U07 T1A_U08 T1A_U11 T1A_U13 T1A_U14 T1A_U15 T1A_U16
U_05	A student can make constructional dimensioning of foundations.	I/p	B_U02 B_U12 B_U13 B_U16	T1A_U03 T1A_U04 T1A_U05 T1A_U07 T1A_U08 T1A_U11 T1A_U13 T1A_U14 T1A_U15 T1A_U16
U_06	A student can design a pile foundation.	I/p	B_U02 B_U03 B_U12 B_U13 B_U16	T1A_U01 T1A_U02 T1A_U03 T1A_U04 T1A_U05 T1A_U07 T1A_U08 T1A_U11 T1A_U13 T1A_U14 T1A_U15

				T1A_U16
U_07	A student can select an appropriate method of reinforcing substratum depending on water and soil conditions and design needs.	I	B_U03 B_U15 B_U16	T1A_U01 T1A_U02 T1A_U03 T1A_U05 T1A_U07 T1A_U08 T1A_U11 T1A_U14 T1A_U16
K_01	A student can work responsibly on a given issue.	p	B_K01	T1A_K03
K_02	A student is responsible for the reliability of the obtained results and their interpretation.	p	B_K02	T1A_K02 T1A_K05 T1A_K07
K_03	A student is aware of the necessity to raise his/her professional competences.	I/p	B_K03	T1A_K01 T1A_K05 T1A_K06

Module content:

1. Topics to be covered in the lectures

No.	Topics	Module outcome code
1	Soil and geotechnical categories of a building object.	W_01 K_03
2	Foundation methods.	W_02 K_03
3	Direct foundations (their types). The first boundary state (load bearing capability).	W_03 K_03
4	Direct foundations (checking a weak layer). The first boundary state (stability).	W_03 K_03
5	The subsidence of a single foundation. The types of the second boundary state.	W_03 K_03
6	Constructional dimensioning of direct foundations.	W_03 K_03
7	The classification of piles.	W_04 K_03
8	Designing pile foundations.	W_04 K_03
9	Subsidence on wells and caissons.	W_05 K_03
10	The types of retaining structures.	W_06 K_03
11	Designing retaining structures.	W_06 K_03
12	Diaphragm walls.	W_06 K_03
13	Pilings and diaphragm walls.	W_03 W_04 W_06 K_03
14	The methods of reinforcing substratum.	W_07 U_07 K_03

2. Topics to be covered in the classes

3. Topics to be covered in the laboratories

4. Topics to be covered in the projects

Project number	Topics	Module outcome
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		code
1	A project of settling on eccentrically loaded steps and benches.	W_03 U_01 U_02 U_03 U_04 U_05 K_01 K_02 K_03
2	A project of settling on piles.	W_04 U_06 K_01 K_02 K_03

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
W_02	An examination
W_03	An examination and a project
W_04	An examination and a project
W_05	An examination
W_06	An examination
W_07	An examination
U_01	A project
U_02	An examination and a project
U_03	An examination and a project
U_04	An examination and a project
U_05	An examination and a project
U_06	An examination and a project
U_07	An examination
K_01	A project
K_02	A project
K_03	A project

C. 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)	3
5	Contact hours: participation in project-based classes	15
6	Contact hours: meetings with a project module leader	4
7	Contact hours: attendance at an examination	3
8		

9	Number of contact hours	55 <i>(total)</i>
10	Number of ECTS credits for contact hours <i>(1 ECTS credit =25-30 hours of study time)</i>	2.2
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	25
18	Private study hours: preparation for an examination	10
19		
20	Number of private study hours	45 <i>(total)</i>
21	Number of ECTS credits for private study hours <i>(1 ECTS credit =25-30 hours of study time)</i>	1.8
22	Total study time	100
23	Total ECTS credits for the module <i>(1 ECTS credit =25-30 hours of study time)</i>	4
24	Number of practice-based hours <i>Total practice-based hours</i>	47
25	Number of ECTS credits for practice-based hours <i>(1 ECTS credit =25-30 hours of study time)</i>	1.9