



MODULE SPECIFICATION

Module code	
Module title in Polish	Materiałoznawstwo
Module title in English	Materials Science
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	All
Organisational unit responsible for module delivery	The Department of General Civil Engineering
Module co-ordinator	Przemysław Świercz, PhD, Eng.
Approved by:	Prof. Zbigniew Rusin, 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 2
Semester in the academic year in which the module is taught	summer semester (winter semester/summer semester)
Pre-requisites	None (module code/module title, where appropriate)
Examination required	No (Yes/No)
ECTS credits	2

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



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



C. LEARNING OUTCOMES AND ASSESSMENT METHODS

Module aims	The aim of the module are as follows: obtaining basic information concerning physical and mechanical properties of construction materials (including installation materials, ceramic materials, concrete materials, plastics, materials for thermal and acoustic insulation, and sealing materials). Other aim include: the ability of their appropriate selection and assessment (considering the requirements formulated in norm regulations and the applied recommendations).
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Module outcome code	Module learning outcomes	Mode of instruction (I/c/lab/p/ others)	Corresponding programme outcome code	Corresponding discipline-specific outcome code
W_01	A student knows and understands basic physical and mechanical properties of construction materials.	I/I	IŚ_W01	T1A_W01; T1A_W02
W_02	A student has general knowledge on the specificity, the range of application and assessment of various construction materials.	I/I	IŚ_W06, IŚ_W08	T1A_W03; T1A_W04, T1A_W05; T1A_W07
U_01	A student can assess and select a material for the needs of environmental engineering.	I/I	IŚ_U12, IŚ_U15	T1A_U08; T1A_U09; T1A_U07; T1A_U10; T1A_U14, T1A_U15
U_02	A student can make simple laboratory tests and refer their results to applicable technical requirements.	I	IŚ_U12, IŚ_U15	T1A_U08; T1A_U09; T1A_U07; T1A_U10; T1A_U14; T1A_U15
U_03	A student acts according to OHS regulations binding in the laboratory.	I	IŚ_U26	T1A; U11
K_01	A student can co-operate in a team on the assigned task.	I	IŚ_K01; IŚ_K05	T1A_K03; T1A_K04
K_02	A student understands the significance of responsibility for the reliability of the presented examination results and their interpretation.	I	IŚ_K02; IŚ_K05	T1A_K02; T1A_K03; T1A_K04; T1A_K05
K_03	A student formulated and the results of his/her own works.	I	IŚ_K07	T1A_K07

Module content:

1. Topics to be covered in the lectures

No.	Topics	Module outcome code
1	General classification of construction materials. The durability of materials and construction products.	W_01; W_02; U_01
2	Physical and mechanical properties of materials.	W_01; W_02; U_01
3	Mineral bonds and concrete products.	W_01; W_02; U_01
4	Ceramic materials and products.	W_01; W_02; U_01
5	Insulation materials. Products from steel and non-ferrous materials.	W_01; W_02; U_01
6	Products from plastics (their properties and application).	W_01; W_02; U_01
7	Selecting materials for networks and installations (concerning environmental engineering).	W_01; W_02; U_01
8	Introduction to the recycling of plastics.	W_01; W_02;



		U_01
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2. Topics to be covered in the classes

3. Topics to be covered in the laboratories

No.	Topics	Module outcome code
1.	Introduction to laboratory classes. The aim and scope of the subject. The issues concerning OHS.	U_03
2.	Examining the selected physical properties of construction materials. Labelling density with the Le Chatelier volume meter; labelling apparent volumetric density with the direct method; labelling apparent volumetric density with the hydrostatic method; calculating material tightness and porosity; calculating mass and volumetric absorbability.	W_01;W_02 U_01; U_02 K_01; K_02 K_03
3.	Examining technical features of construction bonds. Labelling normal consistence and bonding time of a plaster bond. Labelling the grinding degree (a proper surface) of cement.	W_01;W_02 U_01; U_02 K_01; K_02 K_03
4.	Examining the selected technical properties of ceramic materials. Controlling external features of the selected ceramic construction materials (and comparing them with the requirements of appropriate norms).	W_01;W_02 U_01; U_02 K_01; K_02 K_03
5.	Thermoinsulating materials. Examining the λ thermal conductivity coefficient. Calculating the coefficient of heat conduction λ with the method of indetermined heat flow for two selected materials. Comparing the features of thermoinsulating features of two examined materials.	W_01;W_02 U_01; U_02 K_01; K_02 K_03
6.	Examining the selected technical features of aggregate. Sieve analysis of three types of aggregates. Preparing size distribution curves. Labelling apparent density of aggregate in a loose and dense condition. Labelling the contents of irregular grains. Assessing the usefulness of the examined aggregate for concrete.	W_01;W_02 U_01; U_02 K_01; K_02 K_03
7.	A multimedia presentation concerning the properties and range of application as regards the selected materials of construction products.	W_01;W_02 U_01; U_02 K_01; K_02 K_03
8.	A test on laboratory classes No 2-6.	W_01;W_02 U_01; U_02 K_03

Assessment methods

Effect symbol	Methods of assessing teaching results (assessment method, including skills – reference to a particular project, laboratory assignments, etc.)
W_01	A test and a report
W_02	A test and a report
U_01	A test and a report
U_02	A test and a report
U_03	A test and a report
K_01	A test and a report
K_02	A test and a report



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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	15
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>(total)</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	2
12	Private study hours: preparation for classes	
13	Private study hours: preparation for tests	2
14	Private study hours: preparation for laboratories	4
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>(total)</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>	29
25	Number of ECTS credits for practice-based hours <i>(1 ECTS credit = 25-30 hours of study time)</i>	1,16

E. READING LIST

References	
Module website	