

MODULE SPECIFICATION

Module code	
Module title in Polish	Materiały Budowlane
Module title in English	Construction and Building Materials
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	Department of Civil Engineering Technology and Organization
Module co-ordinator	Edyta Spychał, Ph.D. 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 3
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	No <i>(yes / no)</i>
ECTS credits	3

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

* 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 general knowledge on construction materials (including technical, health, economic, and social conditions of using them); other aims include the ability of assessing and selecting them drawing particular attention to the requirements formulated in standards and the applied recommendations.
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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 and understands basic physical and mechanical properties of construction materials.	l/l	B_W01	T1A_W01 T1A_W04
W_02	A student has general knowledge on the specificity and the range of application concerning various construction materials.	l/l	B_W18	T1A_W02
U_01	A student can make simple laboratory tests and refer their results to applicable technical requirements.	l	B_U23 B_U24	T1A_U08
U_02	A student can obtain information concerning civil engineering from the literature on the subject and databases. In addition, a student is capable of self-education; furthermore, a student can prepare a documented study as well as an oral presentation concerning the issues concerning civil engineering.	l	B_U29	T1A_U01 T1A_U03 T1A_U04 T1A_U05
K_01	A student can co-operate in a team on the assigned task.	l	B_K01	T1A_K03 T1A_K04
K_02	A student understands the significance of the responsibility for the reliability of the presented research results and their interpretation.	l	B_K02	T1A_K05
K_03	A student formulates conclusions and described the results of his/her own work. A student is also communicative in multimedia presentations.	l	B_K04	T1A_K01 T1A_K07
K_04	A student understands the significance of OHS regulations in the laboratory.	l	B_K05	T1A_K02

Module content:

1. Topics to be covered in the lectures

No.	Topics	Module outcome code
1	General classification of construction materials (a historical outline and modern history); technical requirements and their reference to normative documents and technical recommendations. Basic physical properties of materials and their interpretation (density, volumetric density, tightness, and porosity); radioactivity.	W_01 W_02
2	Water and its impact on production conditions and functional durability of materials (the properties of water, displacement and retention forms in porous materials; the significance of a capillary pressure, and plastic shrinkage).	W_01 W_02
3	Thermal properties (thermal volume, heat transfer support; thermal deformability; the impact of temperature on the change of properties).	W_01 W_02
4	Mechanical properties (durability, deformability, hardness, abrasiveness, resistance to hit, creep and relaxation). Ceramic materials in civil engineering (production, classification, properties).	W_01 W_02
5	Rocks and minerals, the use of stone mineral in civil engineering, mineral bonds (calcium, plaster, and cement – the range of applications).	W_02
6	Timber and timber products, glass (its production and applications);	W_02

	bituminous materials.	
7	Metals and their applications; paints and varnishes; finishing and insulation materials.	W_02
8	A test.	W_01 W_02

2. Topics to be covered in the classes

No.	Topics	Module outcome code
1	Introduction to laboratory classes. The aim and scope of the subject. Issues concerning OHS. Introduction to bibliography, division of students into groups.	K_04
2	Task 1. The identification of construction materials. The identification and classification of the selected construction materials depending on the origin of raw material, material type, its purpose and structural division. The description of features and properties of the selected construction materials.	W_01, W_02 U_01, U_02, K_01, K_02, K_03, K_04
3	Task 2. Examining the selected physical properties of construction materials. Marking density with the Le Chatelier volume meter; labelling volumetric density (apparent) with the direct method; determining volumetric density (apparent) 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, K_04
4	Task 3. Examining technical features of constructional bonds. Labelling normal consistency and setting time of a gypsum paste. Labelling the degree of grinding (concerning a proper surface) of cement.	W_01, W_02 U_01, U_02, K_01, K_02, K_03, K_04
5	Task 4. Examining the selected technical features of ceramic materials. Checking 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, K_04
6	Task 5. Preparing cement mortars and determination of consistency and volumetric density of the prepared mortars. Forming samples. Calculating the number of components in 1m ³ of the mortar. Determining the impact of aerating and plasticising admixtures on the properties of fresh mortars.	W_01, W_02 U_01, U_02, K_01, K_02, K_03, K_04
7	Test 1.	W_01, W_02 U_01, U_02, K_01,

		K_02, K_03, K_04
8	Task 6. Thermoinsulating materials. Examining the coefficient of heat conduction λ . Calculating the coefficient of heat conduction λ with the method of undetermined 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, K_04
9	Task 7. 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, K_04
10	Task 8. Examining technical features of hardened mortars. Labelling volumetric density of the previously prepared samples with the direct method. Testing their mechanical properties. Capillary binding of samples. Comparing labelling results with and without admixtures.	W_01, W_02 U_01, U_02, K_01, K_02, K_03, K_04
11	Task 9. Examining technical features of constructional timber. Recognising the types of timber concerning the previously prepared samples with the macroscopic method. Labelling their volumetric density. Calculating the resistance of timber to pressing, bending and torsioning.	W_01, W_02 U_01, U_02, K_01, K_02, K_03, K_04
12	Task 10. Examining technical features of painting materials. Labelling the flow time of the painting product with the use of a viscosity cup. Measuring thickness of a varnish layer. Assessing elasticity of a varnish layer by bending. Assessing adherence of a varnish layer to surface with the cross cut test. Assessing the resistance of the varnish layer to hit (Du Pont's apparatus).	W_01, W_02 U_01, U_02, K_01, K_02, K_03, K_04
13	Test 2.	W_01, W_02 U_01, U_02, K_01, K_02, K_03, K_04
14	A presentation in Power Point of the prepared individual subjects concerning the selected materials or construction products.	W_01, W_02 U_02,
15	A presentation in Power Point of the prepared individual subjects concerning the selected materials or construction products.	W_01, W_02, U_02,

		K_03
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3. Topics to be covered in the laboratories
4. Topics to be covered in the projects

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
U_01	A test, completing laboratory class assignments, laboratory test reports
U_02	A multi-media presentation, laboratory test reports
K_01	Completing laboratory class assignments
K_02	Completing laboratory class assignments, laboratory test reports
K_03	A report on laboratory tests, a multi-media presentation
K_04	Completing laboratory class assignments

C. 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	30
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	47 <i>(total)</i>
10	Number of ECTS credits for contact hours <i>(1 ECTS credit =25-30 hours of study time)</i>	1.8
11	Private study hours: background reading for lectures	10
12	Private study hours: preparation for classes	
13	Private study hours: preparation for tests	6
14	Private study hours: preparation for laboratories	5
15	Private study hours: writing reports	7
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		2
20	Number of private study hours	30 <i>(total)</i>
21	Number of ECTS credits for private study hours <i>(1 ECTS credit =25-30 hours of study time)</i>	1.2

22	Total study time	77
23	Total ECTS credits for the module <i>(1 ECTS credit =25-30 hours of study time)</i>	3
24	Number of practice-based hours <i>Total practice-based hours</i>	37
25	Number of ECTS credits for practice-based hours <i>(1 ECTS credit =25-30 hours of study time)</i>	1.5