

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Construction Materials</b>		Code <b>1010101121010110054</b>
Field of study <b>Civil Engineering First-cycle Studies</b>	Profile of study (general academic, practical) <b>general academic</b>	Year /Semester <b>1 / 2</b>
Elective path/specialty <b>-</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>First-cycle studies</b>	Form of study (full-time, part-time) <b>full-time</b>	
No. of hours Lecture: <b>30</b> Classes: <b>-</b> Laboratory: <b>30</b> Project/seminars: <b>-</b>		No. of credits <b>5</b>
Status of the course in the study program (Basic, major, other) <b>other</b>		(university-wide, from another field) <b>university-wide</b>
Education areas and fields of science and art <b>technical sciences</b>		ECTS distribution (number and %) <b>4 100%</b>
<b>Responsible for subject / lecturer:</b>  Dr hab. inż. Krzysztof Zieliński, prof. nadzw. PP email: krzysztof.zielinski@put.poznan.pl tel. 61 665 21 68 Faculty of Civil and Environmental Engineering ul. Piotrowo 5, 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Basic knowledge of the following subjects: mathematic, physics, chemistry
2	<b>Skills</b>	Ability to obtain information from literature and other sources. Capability to combine obtained information.
3	<b>Social competencies</b>	Understanding the need to continue education throughout the professional career. Understanding the necessity of co-operation and team work.
<b>Assumptions and objectives of the course:</b> Passing on engineering knowledge regarding proper selection and assessment of building materials quality and usefulness both in the phase of design and on-site application.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. Student knows basic principles of material technologies and construction elements - [[K_W12, K_W14]] 2. Student knows most important construction materials, their classification and application range - [[K_W12, K_W14]] 3. Student knows the principles of defining selected technical characteristics of construction materials - [[K_W12, K_W14]]		
<b>Skills:</b>		
1. Select optimum building material for a particular building/ structure - [[K_U20]] 2. Make analysis of information included in technical documentation of the building/ structure - [[K_U20]] 3. Carry out simple laboratory tests of building materials quality - [[K_U13]]		
<b>Social competencies:</b>		
1. Student is capable of working individually as well as co-operating within a team on a given assignment - [[K_K01]] 2. Student is responsible for the accuracy of results obtained and is able to provide interpretation - [[K_K02]] 3. Student individually expands his/ her knowledge concerning modern techniques and technologies - [[K_K03]]		
<b>Assessment methods of study outcomes</b>		

<p>Lectures:          - oral or written exam,          Laboratory classes:          - oral test of knowledge before the start of laboratory classes,          - written report after each laboratory class,          - final test after completing the classes.</p>		
<b>Course description</b>		
<p><b>Lectures</b>          Basic information on the standardization of construction materials. Technical characteristics of building materials. General classification of building materials. Test methods. Durability of building materials. Stone materials. Aggregates (light, normal and heavy). Building ceramics/tiles. Wood. Biological corrosion of wood. Bitumens and waterproofing materials. Heat-insulation and sound-deadening materials. Metals. Binding materials. Common and special cement types, lime, gypsum. Basic information about plastics. Building glass. Attestation and control of the quality of building materials. Mortars. Preliminary information on designing concrete mixes.</p> <p><b>Laboratory classes</b>          Testing binders (the right amount of water in the cement paste, binding time, preparation of cement samples and determining the actual cement strength class after 28 days of curing, testing surface area), Study of natural and crushed aggregates (sieve analysis, bulk density in loose and compact state, shape indicator, content of dust). Testing ceramics (external characteristics, determining the strength class, basic disadvantages, testing flexural strength of tiles), Study of membranes (modified and oxidised), tensile strength, elongation at break, testing oxidised and modified bitumens (penetration, softening point). Testing plastics and rubber (flame analysis of plastics, determination of hardness, testing thickness of coatings/ paint, rubber abrasion).</p>		
<p><b>Basic bibliography:</b>          1. Stefańczyk B., Budownictwo ogólne, t. 1: Materiały i wyroby budowlane, Warszawa, Arkady 2005          2. Żenczykowski W., Budownictwo ogólne, t. 1, Warszawa, Arkady 1992          3. Zieliński K., Podstawy technologii betonu, Wydawnictwo Politechniki Poznańskiej, Poznań 2012</p>		
<p><b>Additional bibliography:</b>          1. Szymański E., Materiałoznawstwo budowlane z technologią betonu, cz. 2, Warszawa, Oficyna Wydawnicza Politechniki Warszawskiej 1999          2. Monthly magazines: Materiały budowlane, Izolacje and other technical magazines dealing with building materials. Information and technical materials provided by building materials manufacturers, the Internet</p>		
<b>Result of average student's workload</b>		
<b>Activity</b>	<b>Time (working hours)</b>	
1. participation in lectures	30	
2. participation in laboratory classes.	30	
3. preparation/ revision for laboratory classes	20	
4. completing reports from laboratory classes (at home)	15	
5. participation in consultations	5	
6. preparation/ revision for exam and presence during the exam	30	
<b>Student's workload</b>		
<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	100	4
Contact hours	70	3
Practical activities	40	2