



## Subject card

Subject name and code	, PG_00062075						
Field of study	Civil Engineering						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2023/2024		
Education level	first-cycle studies	Subject group					
Mode of study	Part-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			Polish		
Semester of study	3	ECTS credits			6.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Department of Mechanics of Materials and Structures -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor	mgr inż. Lucyna Grabarczyk					
	Teachers	mgr inż. Lucyna Grabarczyk dr inż. Elżbieta Haustein					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	25.0	0.0	0.0	55
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	55		0.0		0.0	55
Subject objectives	Acquainted with the classification and determination of technical characteristics of building materials, concrete components, concrete mixtures and hardened concrete; selection of concrete components and determination of concrete composition, classification and use of concrete, basic technological processes in concrete production.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U01] Apply knowledge and understanding of mathematics as well as sciences and engineering disciplines underlying civil engineering to solve engineering problems and issues.	The student designs concrete taking into account the purpose, method of placing and compacting the concrete mixture.	[SU3] Assessment of ability to use knowledge gained from the subject
	[K6_W02] Demonstrate knowledge and understanding of the processes and established methods of analysis / solution of engineering issues & problems in the field of civil engineering and of their limitations.	The student knows the basic ingredients of concrete. The student knows the basic methods of testing the components of concrete, concrete mixture and concrete. The student designs ordinary concrete. The student knows the methods of transporting concrete mix. The student knows concrete care methods. The student is able to design concrete in accordance with PN-EN 206:2014	[SW3] Assessment of knowledge contained in written work and projects
	[K6_U05] Conducts research (obtaining information, simulations, experimental methods) in the field of construction in order to solve specific tasks and report research results.	The student knows the properties of basic building materials. The student is able to perform basic tests of building materials.	[SU1] Assessment of task fulfilment
	[K6_W05] Demonstrate knowledge and understanding of research methods (obtaining information, simulations, experimental methods) in the field of civil engineering.	The student selects appropriate ingredients (type of aggregate, cement, admixture, additive) and methods of designing ordinary concrete.	[SW3] Assessment of knowledge contained in written work and projects
[K6_K03] Can effectively, clearly and unambiguously convey information, describe activities and communicate their results/ outcomes to engineers or a wider audience using appropriate communication methods and tools.	The student is able to prepare research results in the form of a presentation, analyze and present them to the group.	[SK4] Assessment of communication skills, including language correctness	
Subject contents	Material trends in modern construction. Technical characteristics of building materials. Ceramic building materials. Products based on lime, cement and gypsum binders. Building glass - properties and products used in construction. Wood and wood-based construction products. Materials for thermal insulation and noise protection. Bituminous and artificial resin materials for moisture insulation. Plastics - properties, classification, products, use in construction. The origin and definition of concrete. Concrete components: binders, aggregates, admixtures, additives according to current standards. Basic properties of binders. Lime and gypsum binders; types and properties. Cement types and classifications. Main and secondary components, chemical and mineral composition. Special cements. aggregates; classification, origin, properties. Make-up water. Admixtures and additions. Concrete mix - consistency, workability, homogeneity. Selected methods of concrete mix composition design. Concrete mix testing. Concrete testing. Analysis of concrete test results. Concrete mix production. Vibrate. Effect of temperature on young concrete. Concrete care.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Report on laboratory tests	100.0%	50.0%
	Test	50.0%	50.0%
Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>1. Jamróży Z.; Beton i jego technologie. PWN Warszawa, 2000</li> <li>2. Kluz T., Eman K.: -Projektowanie betonów. Arkady Warszawa 1969.</li> <li>3. Neville A. M.: Właściwości betonu, Polski Cement Kraków 2000</li> <li>4. Małolepszy J.; Deja J; Brylicki W, Gawlicki M: -Technologia betonu. Metody badań</li> <li>5. Piasta J., Piasta W.: - Beton zwykły.</li> <li>6. <a href="https://pl.scribd.com/doc/54313994/Technologia-betonu">https://pl.scribd.com/doc/54313994/Technologia-betonu</a></li> </ol>	

	Supplementary literature	1. Praca zbiorowa. Budownictwo ogólne tom 1 i 2 Arkady 2005, 2006  2. Bukowski B.; Kuczyński: Budownictwo betonowe. Tom I i II. Arkady, Warszawa 1977
	eResources addresses	Adresy na platformie eNauczanie: Materiały budowlane z technologią betonów - 2023/24 - Moodle ID: 14983 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=14983">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=14983</a>
Example issues/ example questions/ tasks being completed		1. Discuss the basic properties of clinker bricks, roof tiles, building glass, cellular concrete elements. 2. Discuss the components of concrete. 3. Discuss 1 concrete design method. 4. Discuss the test methods for concrete mix and concrete.
Work placement		Not applicable

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