



## Subject card

Subject name and code	Special Concretes, PG_00044317						
Field of study	Civil Engineering						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2022/2023		
Education level	second-cycle studies	Subject group			Optional subject group Subject group related to scientific research in the field of study		
Mode of study	Part-time studies	Mode of delivery			blended-learning		
Year of study	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Katedra Wytrzymałości Materiałów -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		mgr inż. Lucyna Grabarczyk				
	Teachers		mgr inż. Lucyna Grabarczyk				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	10.0	0.0	0.0	0.0	25
	E-learning hours included: 15.0						
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	25		5.0		45.0	75
Subject objectives	The aim of the course is to supplement the knowledge acquired during the basic course on concrete technology. Knowledge of new generation cement materials and unconventional methods or conditions of laying and care. Practical knowledge of test methods for the properties of special concretes.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W15] has deep and adequate knowledge of civil engineering, within offered specialization and profile		The student knows modern concreting techniques and the possibilities of modifying the properties of concrete. The student defines the material, technological and environmental conditions of concrete durability.		[SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects		
	[K7_U15] has advanced skills in civil engineering within offered specialization/profile		The student is able to: - design the composition of concrete with special requirements, - use the knowledge in the field of concreting and transport techniques, - verify the quality of concrete with an appropriate test method.		[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task		
Subject contents	1. Classification of new generation concrete. 2. Material, technological and environmental conditions of concrete durability. 3. Classification of equipment for the production, transport, laying and compacting of concrete mix. 4. Design and implementation requirements for selected special concretes: lightweight concretes, architectural concretes, SCC concretes, high strength concretes, fibrobetones. 5. Concrete care. 6. Concrete in prefabrication.						
Prerequisites and co-requisites	Knowledge of basic concrete technology and concreting techniques.						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Report on laboratory classes		50.0%		40.0%		
	Lecture or presentation		50.0%		30.0%		
	Presence in laboratory classes		100.0%		30.0%		

Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>1. Neville A.M., "Właściwości betonu", Polski Cement, Kraków 2015</li> <li>2. Jamróży Z., Beton i jego technologie. Wydawnictwo Naukowe PWN Warszawa 2009</li> <li>3. Małolepszy J.; Deja J; Brylicki W, Gawlicki M., Technologia betonu. Metody badań. Kraków 2000</li> </ol>
	Supplementary literature	<ol style="list-style-type: none"> <li>1. Szwabowski J., Gołaszewski J. Technologia betonu samozagęszczalnego, Stowarzyszenie Producentów Cementu, Kraków 2010</li> <li>2. Articles in magazines: Materiały budowlane, Inżynieria i Budownictwo, Concrete and Building Materials, ACI Materials, ACI Structures</li> </ol>
	eResources addresses	
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> <li>1. Cement. Composition, properties, classes and types of common cements and special cements. Discuss the influence of cement type on concrete hardening processes.</li> <li>2. Chemical admixtures for concrete. Division, properties, impact on rheological properties of concrete mix and concrete.</li> <li>3. Additives for concrete. Division, properties, influence on the properties of concrete.</li> <li>4. Rules for determining the composition of a concrete mix. Methods of designing the composition of a concrete mix. Discuss 1 design method. Concrete classes - definition, types. Properties of hardened concrete. Factors on which the compressive strength of concrete depends. Criteria for conformity assessment.</li> <li>5. Factors determining the durability of concrete. Exposure classes.</li> <li>6. Selection of ingredients, design, properties and application of special concretes (lightweight concretes, architectural concretes, SCC concretes, high strength concretes, fibrobetones.)</li> </ol>	
Work placement	Not applicable	