



## Subject card

Subject name and code	Next-generation concrete structures , PG_00045887						
Field of study	Civil Engineering						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2023/2024		
Education level	second-cycle studies	Subject group			Optional subject group Subject group related to scientific research in the field of study		
Mode of study	Full-time studies	Mode of delivery			at the university		
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	Department of Concrete Structures -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Magdalena Pawelska-Mazur					
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	0.0	0.0	30
	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	30	5.0		40.0	75	
Subject objectives	Presentation of the current trends and problems regarding new generation concrete structures.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_K03] can think and act creatively and enterprisingly and works for society	The student is able to solve problems in the field of modern concrete structures.			[SK5] Assessment of ability to solve problems that arise in practice		
	[K7_W10] knows modern building materials as well as technologies and methods of its manufacturing and production of construction elements	The student is prepared to analyze the use of modern concrete materials and to act in a creative and entrepreneurial way in the use of new generation concrete in construction.			[SW1] Assessment of factual knowledge		
	[K7_W15] has deep and adequate knowledge of civil engineering, within offered specialization and profile	The student is able to obtain information from literature, databases and other sources, is able to integrate the obtained information, interpret and critically evaluate it, as well as draw conclusions and formulate and exhaustively justify opinions.			[SW2] Assessment of knowledge contained in presentation		
Subject contents	Modern prefabrication, new generation concrete: fibro-concrete, self-cleaning concrete, self-healing concrete, transparent concrete. Concrete structures from a 3D printer. Sustainable concrete structures.						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
		60.0%			100.0%		

Recommended reading	Basic literature	<p>Małolepszy J. i inni (praca zbiorowa) - Materiały budowlane. Podstawy technologii i metody badań. AGH Uczel. Wyd. Nauk.-dydaktyczne. Kraków 2004</p> <p>Kurdowski W. - Chemia cementu. PWN - Warszawa 1991 r.</p> <p>Praca zbiorowa: W. Brylicki, A. Derdacka, M. Gawlicki, J. Małolepszy - Technologiabudowlanych materiałów wiążących, P.W.Sz. W</p> <p>Neville A. - Właściwości betonu. Wyd. Polski Cement. Kraków 2000</p> <p>Małolepszy J. i inni - Technologia betonu - metody badań, Wydawnictwo AGH Kraków 2000</p> <p>Jamroży Z. - Beton i jego technologie, PWN Warszawa 2001</p> <p>Rusin Z. - Technologia betonów mrozoodpornych. Wyd. Polski Cement. Kraków 2002</p> <p>Giergiczny Z. i inni - Cementy z dodatkami mineralnymi w technologii betonów nowogeneracji Heidelberg Cement Group. Opole 2002</p> <p>Fagerlund C. - Trwałość konstrukcji betonowych. Wyd. Arkady. Warszawa 1997</p>
	Supplementary literature	<p>Szwabowski J. - Reologia mieszanek betonowych. Wydawnictwo Politechniki Śląskiej 1980</p> <p>Jatymowicz M., Siejko J., Zapotoczna-Sytek G. - Technologia autoklawizowanego betonukomórkowego. Wydawnictwo A Warszawa 1980</p> <p>Czarnecki L. i inni (praca zbiorowa) - Beton według normy PN-EN 206-1 - Komentarz.Wyd. Polski Cement + P.K.N.. Kraków 2004</p> <p>Ściślewski Z. - Ochrona konstrukcji żelbetowych. Arkady Warszawa 1999</p>
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	<p>What are the features of concrete with steel fibers? The use of fibrobeton with steel fibers.</p> <p>Concrete on reactive powders - features and application</p> <p>Architectural concrete - features and conditions to be met when making architectural concrete</p>	
Work placement	Not applicable	