



Subject card

Subject name and code	Concrete Structures II, PG_00065726						
Field of study	Civil Engineering						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2025/2026		
Education level	first-cycle studies		Subject group				
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		Polish		
Semester of study	6		ECTS credits		6.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Engineering Structures -> Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Ireneusz Marzec				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	15.0	30.0	0.0	75
	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	75		0.0		0.0	75
Subject objectives	Student can determine the effect of transverse forces on the support zone of a reinforced concrete beam, knows the cracks morphology and failure mechanisms of reinforced concrete beams and the principles of dimensioning transverse reinforcement. Can calculate the required theoretical reinforcement in an eccentrically compressed column. Knows the design principles of reinforced concrete frames, hinges, column and beam supports. Student has knowledge of reinforced concrete frame design, dimensioning of reinforcement for bending, shear, eccentric compression, calculation of structures in terms of SGN and SGU, shaping of reinforcement of beams, columns.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W07] Understand the investment's impact on the environment and the interrelationships and dependencies between the building structure and the natural environment		Students will be familiar with the principles of sustainable design of reinforced concrete structures, and will be able to identify design elements affecting the environment (e.g. quantity of materials, construction technology).		[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects		
	[K6_U07] Design and build engineering structures in a sustainable manner, with care for the natural environment and a minimum carbon footprint		The student is able to optimise the design of a reinforced concrete structure in terms of material consumption (reinforcement and concrete) and execution technology, minimising the environmental impact.		[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject		
	[K6_W03] Demonstrate knowledge and understanding of the processes, established standards and design methods in the civil engineering subject area and of their limitations.		Student knows the principles of design of reinforced concrete elements according to Eurocode, understands the limitations of the methods used and the influence of the static scheme on the calculation results.		[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects		
	[K6_U03] Design engineering objects and details, processes and engineering systems by applying appropriate standards and methods of design.		Student is able to calculate and design reinforcement in reinforced concrete beams subjected to bending and shear and in eccentrically compressed columns. Design reinforced concrete hall frame elements including structural details (nodes, hinges, cantilevers).		[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		

Subject contents	Course content – lecture Shear in reinforced concrete bar elements: outline of the problem in the context of theory and experimental studies, methods of dimensioning shear reinforcement for beams, principles of shear reinforcement design. Calculation and design of reinforcement in eccentrically compressed bar elements. Reinforced concrete frame halls - corners, nodes, collapsed rafters, hinges, pressure. Structural elements of frames including reinforced concrete cantilevers.		
Prerequisites and co-requisites	no requirements		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		50.0%	50.0%
		50.0%	30.0%
		50.0%	20.0%
Recommended reading	Basic literature	1. M. Knauff, Obliczanie konstrukcji żelbetowych według Eurokodu 2, PWN Warszawa 2012 2. M. Knauff, A. Golubińska, P. Knyziak: Tablice i wzory do projektowania konstrukcji żelbetowych z przykładami obliczeń, PWN 2013 3. M. Knauff, B. Grzeszczykowski, A. Golubińska, Przykłady obliczania konstrukcji żelbetowych zarysowanie zeszyt 3, PWN, Warszawa 2018 4. W. Starosolski, Konstrukcje żelbetowe według Eurokodu 2 i norm związanych, tom 1,2,3 Wydawnictwo Naukowe PWN, Warszawa 2011-2012 5. Konstrukcje betonowe, żelbetowe i sprężone, Komentarz naukowy do normy PN-B-03264 t. I i II, ITB Warszawa 2005 6. Podstawy projektowania konstrukcji żelbetowych i sprężonych wg Eurokodu 2 praca zbiorowa pod red. M. Knauffa, Dolnośląskie Wydawnictwo Edukacyjne, 2006 7. A. Łapko, B.Ch. Jensen, Podstawy projektowania i algorytmy obliczeń konstrukcji żelbetowych, Arkady 2005 8. Norma europejska EN-1992-1-1:2004, oraz wersja polska PN-EN-1992-1-1:2008: Projektowanie konstrukcji z betonu . Reguły ogólne i reguły dla budynków 9. Norma PN-B-03264:2002, Konstrukcje betonowe, żelbetowe i sprężone 10. Nagrodzka-Godycka, Badanie właściwości betonu i żelbetu w warunkach laboratoryjnych, Arkady, W-wa 1999, 11. Ł. Drobiec, R. Jasiński, A. Piekarczyk Diagnostyka Konstrukcji Żelbetowych, Metodologia, Badania polowe, badania laboratoryjne betonu i stali, Wydawnictwo Naukowe PWN, tom 1, 2010	
	Supplementary literature	1. J. Kobiak W.Stachurski, <i>Konstrukcje żelbetowe</i>, t.1, Arkady, Warszawa 1984 2. J.Kobiak W.Stachurski, <i>Konstrukcje żelbetowe</i>, t.2, Arkady, Warszawa 1987 3. J.Kobiak W.Stachurski, <i>Konstrukcje żelbetowe</i>, t.3, Arkady, Warszawa 1989 4. T. Godycki-Ćwirko, <i>Mechanika betonu</i>, Arkady, Warszawa 1982 5. T. Godycki-Ćwirko, <i>Ścinanie w żelbecie</i>, Arkady, Warszawa 1968 6. W. Starosolski, Komputerowe modelowanie betonowych ustrojów inżynierskich-wybrane zagadnienia, Wydawnictwo Politechniki Śląskiej, Gliwice 2013, tom I i II 7. A. Ajdukiewicz, Eurokod 2 -Podręczny skrót dla projektantów konstrukcji żelbetowych, Stowarzyszenie Producentów Cementu - Polski Cement, Kraków 2009 8. K. Nagrodzka-Godycka, <i>Badanie właściwości betonu i żelbetu w warunkach laboratoryjnych</i>, Arkady, W-wa 1999, 9. Ł. Drobiec, R. Jasiński, A. Piekarczyk Diagnostyka Konstrukcji Żelbetowych, Metodologia, Badania polowe, badania laboratoryjne betonu i stali, Wydawnictwo Naukowe PWN, tom 1, 2010	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Practical activities within the subject	Not applicable		

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