



## Subject card

Subject name and code	Concrete Structures, PG_00044293						
Field of study	Civil Engineering						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2023/2024		
Education level	second-cycle studies	Subject group			Obligatory subject group in the field of study Subject group related to scientific research in the field of study		
Mode of study	Part-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			8.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Andrzej Ambroziak					
	Teachers	dr hab. inż. Andrzej Ambroziak mgr inż. Marek Kin					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	20.0	0.0	0.0	0.0	50
	E-learning hours included: 0.0 Adresy na platformie eNauczanie:						
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	50	10.0		140.0		200
Subject objectives	The aim of teaching the subject is to familiarize students with the principles of work of concrete and reinforced concrete structures, to master the methods of calculating and dimensioning advanced engineering structures.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_W04] has knowledge on advanced strength of materials, modeling and optimisation of materials and constructions; has knowledge of fundamentals of Finite Element Method and general nonlinear analysis of engineering constructions and systems				[SW3] Assessment of knowledge contained in written work and projects		
	[K7_W02] knows principles of analysis, design and dimensioning of complex constructions and its elements				[SW3] Assessment of knowledge contained in written work and projects		
	[K7_K01] is aware of necessity of professional competences improvement; obeys the professional ethics code				[SK3] Assessment of ability to organize work [SK4] Assessment of communication skills, including language correctness [SK5] Assessment of ability to solve problems that arise in practice [SK1] Assessment of group work skills		
[K7_U01] can evaluate and list any loads acting on constructions				[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task			

Subject contents	Concrete (strength characteristics, immediate and rheological deformations, evaluation of the effects of shrinkage and creep). Prestressing steel (strength characteristics, relaxation, corrosion protection). Concepts of prestressing structures, historical outline, classification of prestressed structures. Prestressing techniques, pre-stressed concrete beams, prestressed concrete beams, other technologies. Losses of prestressing force, evaluation of short-term and rheological losses. Design of prestressed and pre-stressed concrete beams in the elastic phase. Examples of the implementation of prestressed structures. Wall beams - shields. Containers for loose materials. Silos, tanks for liquids. Thin-walled coverings, shells, domes and clapboards, hanging roofs.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Exam	0.0%	50.0%
	Exercise and design task	0.0%	50.0%
Recommended reading	Basic literature	<p>A.Ajdukiewicz J.Mames: Konstrukcje z betonu sprężonego, Polski Cement, Kraków 2004</p> <p>T.Godycki-Ćwirko, A.Czkwianianc: Konstrukcje sprężone, Politechnika Łódzka 1984</p> <p>J.Kobiak W. Stachurski: Konstrukcje żelbetowe, t.2,t.4 Arkady 1991</p> <p>W.Starosolski: Konstrukcje żelbetowe, t1, PWN, Warszawa 2010</p> <p>A.Halicka, D.Franczak: Projektowanie zbiorników żelbetowych, PWN, Warszawa 2011</p> <p>K.Grabiec: Żelbetowe konstrukcje cienkościennie PWN 1999</p>	
	Supplementary literature	<p>A. Ambroziak, P.Kłósowski: Autodesk Robot Structural Analysis podstawy obliczeń. Wydawnictwo Politechniki Gdańskiej, Gdańsk 2010.</p> <p>A. Ambroziak, P.Kłósowski: Autodesk Robot Structural Analysis. Wymiarowanie konstrukcji stalowych i żelbetowych - przykłady obliczeń. Wydawnictwo Politechniki Gdańskiej, Gdańsk 2014.</p>	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		