



## Subject card

Subject name and code	Concrete Structures, PG_00042506						
Field of study	Environmental 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		
Mode of study	Part-time studies	Mode of delivery			e-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	Department of Concrete Structures -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Andrzej Ambroziak					
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	10.0	10.0	0.0	0.0	0.0	20
	E-learning hours included: 20.0						
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	20	3.0		55.0		78
Subject objectives	The aim of teaching the subject is to familiarize students with the essence of construction work concrete and reinforced concrete, mastering the methods of calculating and basic dimensioning elements of simple engineering structures.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_U01] can obtain information from literature, databases and other sources; can integrate the obtained information, interpret and critically evaluate them, draw conclusions, and formulate and comprehensively justify the opinions	The student is able to obtain and use the information on the design of basic elements of concrete and reinforced concrete structures.			[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools		
	[K7_W02] has broadened and well-ordered knowledge of the current law on construction, water, environmental protection and planning and spatial planning.	The student knows how to use the knowledge of the applicable construction law and design a simple reinforced concrete element.			[SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects		
	[K7_W05] has basic knowledge in general construction or in water or sanitary or hydrotechnical or road construction; the impact of construction investments on the environment	The student has knowledge of general construction and can determine the impact of construction investments on the environment.			[SW3] Assessment of knowledge contained in written work and projects		
Subject contents	Outline of the history of reinforced concrete Mechanical properties of concrete and reinforcing steel Concrete (strength characteristics, immediate and rheological deformations, evaluation of the effects of shrinkage and creep). Cooperation of reinforcement with concrete Fire safety of buildings Stress phases of a bending reinforced concrete section Deflection limit state Design basics with regard to shear and torsion in reinforced concrete Design basics due to eccentric compression in reinforced concrete Issues concerning the methods of designing engineering structures.						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
	Exam	60.0%			100.0%		

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.Kłowski: Autodesk Robot Structural Analysis podstawy obliczeń. Wydawnictwo Politechniki Gdańskiej, Gdańsk 2010.</p> <p>A. Ambroziak, P.Kłowski: Autodesk Robot Structural Analysis. Wymiarowanie konstrukcji stalowych i żelbetowych - przykłady obliczeń. Wydawnictwo Politechniki Gdańskiej, Gdańsk 2014.</p>
	eResources addresses	Adresy na platformie eNauczenie:
Example issues/ example questions/ tasks being completed	<p>1. Provide the name and surname of the person considered to be the inventor of reinforced concrete in modern times and the date the invention was patented.2. Give the name and surname of the person believed to have used prestressed elements in modern times.3. Give the division according to the use of concrete in construction elements.4. List the differences between prestressed concrete and post-tensioned concrete.5. What do you understand by: concrete?6. The PN-EN 206 + A1: 2016-12 standard "Concrete - Requirements, properties, production and compliance" applies to concrete used for. ?7. List the basic mechanical properties of concrete?8. The compressive strength of concrete under biaxial and uniform compression is lower or higher (if percentage) than for uniaxial compression.9. What are the standard (according to PN-EN 206 + A1: 2016-12) dimensions and shapes of samples for testing concrete compressive strength?</p>	
Work placement	Not applicable	