



Subject card

Subject name and code	Complex concrete structures, PG_00041056								
Field of study	Civil Engineering								
Date of commencement of studies	October 2025	Academic year of realisation of subject		2025/2026					
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	Full-time studies		Mode of delivery		at the university				
Year of study	1	Language of instruction		English					
Semester of study	1	ECTS credits		4.0					
Learning profile			Assessment form		assessment				
Conducting unit	Department of Building Structures and Material Engineering -> Faculty of Civil and Environmental Engineering -> Wydziały Politechniki Gdańskiej								
Name and surname of lecturer (lecturers)	Subject supervisor Teachers		dr inż. Patryk Ziółkowski						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM		
	Number of study hours	30.0	15.0	0.0	15.0	0.0	60		
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	60		5.0		35.0	100		
Subject objectives	Make acquaintance of students with calculation methods of complex concrete 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					[SW1] Assessment of factual knowledge			
	[K7_W02] knows principles of analysis, design and dimensioning of complex constructions and its elements					[SW1] Assessment of factual knowledge			
	[K7_U02] can design and dimension complex steel, concrete (including reinforced), wood and masonry constructions and its details					[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools			
	[K7_W09] knows advanced methods of building physics with applications in heat and moisture migration in buildings, energy demand for buildings and its acoustics					[SW1] Assessment of factual knowledge			
	[K7_K01] is aware of necessity of professional competences improvement; obeys the professional ethics code					[SK5] Assessment of ability to solve problems that arise in practice [SK2] Assessment of progress of work			

Subject contents	1) Properties of concrete and reinforced-concrete. 2) Flat floors (without ribs and beams). 3) Calculations of two-way reinforced slabs according to theory of elasticity and limit states. 4) Foundation slabs on elastic subsoil. 5) Load bearing capacity of rectangular reinforced concrete beams simultaneously subjected to torsion, bending and shearing. 6) Modeling of reinforced concrete tanks. 7) Failure criteria for concrete. 8) Application of truss models for reinforced concrete and prestressed concrete structures. 9) Wall beams. 10) Size effects in concrete beams. 11) Discrete models. 12) Continuous FE models.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		55.0%	10.0%
		55.0%	90.0%
Recommended reading	Basic literature	lectures	
	Supplementary literature	no need	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Calculation and reinforcement of high concrete beams.		
Work placement	Not applicable		

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