



Subject card

Subject name and code	, PG_00070571						
Field of study	Civil Engineering						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2025/2026		
Education level	first-cycle studies	Subject group			Optional subject group		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	4	Language of instruction			Polish		
Semester of study	8	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Arkadiusz Sitarski					
	Teachers	dr inż. Arkadiusz Sitarski dr hab. inż. Marcin Abramski					
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	15.0	0.0	30
	E-learning hours included: 0.0						
	eNauczanie source address: https://enauczanie.pg.edu.pl/2025/course/view.php?id=5162						
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	0.0		0.0	30	
Subject objectives	<p>The aim of the course is to familiarize students with issues related to bridge structures and their elements made mainly of concrete. We'll discuss the basic types of concrete bridges, construction technologies, and specific construction materials used. Bridge supports and equipment bearings, expansion joints, and safety devices will be discussed.</p> <p>The project involves performing analytical calculations for a multi-girder grid-and-slab system based on precast prestressed elements. The calculations include a prestressing design and drawings of the analyzed structure.</p>						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_K01] Is aware of the key aspects of professional, ethical and social responsibility related to management, business operation, decision making and opinion formulation in civil engineering.	He is responsible and aware of the calculation work performed and the implementation work being carried out.	[SK4] Assessment of communication skills, including language correctness [SK1] Assessment of group work skills
	[K6_U05] Conducts research (obtaining information, simulations, experimental methods) in the field of construction in order to solve specific tasks and report research results.	Not applicable	[SU5] Assessment of ability to present the results of task
	[K6_W03] Demonstrate knowledge and understanding of the processes, established standards and design methods in the civil engineering subject area and of their limitations.	Knows the basic principles of load standards and dimensioning of concrete and prestressed structures.	[SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
	[K6_K04] Engages in independent lifelong learning and individually follows the development of science and technology in the field of civil engineering.	Can assess a problem and indicate the direction of its solution.	[SK4] Assessment of communication skills, including language correctness [SK5] Assessment of ability to solve problems that arise in practice
[K6_K03] Can effectively, clearly and unambiguously convey information, describe activities and communicate their results/ outcomes to engineers or a wider audience using appropriate communication methods and tools.	Can make hand-drawn drawings of bridge structure elements and discuss them with interested parties.	[SK4] Assessment of communication skills, including language correctness [SK5] Assessment of ability to solve problems that arise in practice	
Subject contents	<p>Course content – lecture</p> <p>History outline of bridges made of stone, brick, concrete, reinforced concrete and prestressed concrete. Structural systems of concrete bridges. General principles of the bridge structural analysis. Materials used to erect the reinforced concrete and prestressed concrete bridges. Forming the bridge cross section and the longitudinal section and, as well as, in the plan. Contemporary structural solutions used in concrete bridges. Erection methods of concrete bridges: on scaffold, prefabrication, longitudinal pulling, concreting and cantilever erection. Slab bridges: structural and technological solutions (monolithic and prefab bridges), good points and flaws, applying range, forming in the cross section and in the longitudinal section, supporting solutions, general design principles. Girder bridges - applying range, structural solutions and principles of monolithic and prefab (composite bridges, girder arrangement, determining steel area. Sample concrete bridges of other structural systems (arch bridges, frame bridges, cable-stayed bridges). Elements of bridge fittings: dilatations types and the choice principles, bearings for concrete girder bridges and concrete slab bridges choice of bearing type, dehydration, energy consuming barriers, railings, acoustic barriers on the bridge, connecting temporary slabs..</p> <p>Course content – project</p> <p>Design of a slab grid made of prefabricated prestressed beams - prestressing design.</p>		
Prerequisites and co-requisites	<p>Basics of Structural Mechanics and Strength of Materials. Dimensioning of concrete structures. Basic knowledge of material strength Subjects: Bridge and Tunnels II.</p>		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		60.0%	50.0%
		60.0%	50.0%
Recommended reading	Basic literature	<ul style="list-style-type: none"> Szczygieł J.: Mosty z betonu zbrojonego i sprężonego WKiŁ Warszawa 1978 Leonhardt F.: Budowa mostów. WKiŁ, Warszawa 1982. Madaj A., Wołowicki W.: Mosty betonowe. WKiŁ, Warszawa 1998. Madaj A., Wołowicki W.: Budowa i utrzymanie mostów. WKiŁ, Warszawa 1995. 	
	Supplementary literature	<ul style="list-style-type: none"> Kmiata J.: Mosty betonowe Cz I. Podstawy wymiarowania. WKiŁ, Warszawa 1984. Kmiata J.: Mosty betonowe Cz. II. Podstawy kształtowania. WKiŁ, Warszawa 1984. Głomb J.: Technologia budowy mostów betonowych. WKiŁ, Warszawa 1982. Czerski Z., Pajchel W.: Mosty Żelbetowe. WKiŁ, Warszawa 1969. Czudek H., Radomski W.: Podstawy mostownictwa. PWN, Warszawa 1983. 	
	eResources addresses		

<p>Example issues/ example questions/ tasks being completed</p>	<ul style="list-style-type: none"> - Present static schemes of beam bridges - Present static schemes of slab bridges - Present static schemes of arch bridges - Present static schemes of frame bridges - Common techniques of concrete bridges construction - Present known prefabricated elements for building bridges - Discuss the incremental launching method - Discuss the balanced-cantilever method - What is so-called bridge concrete - Bridge abutments: types, construction, actions - Bridge pillars, types, construction, actions - Bridge equipment
<p>Practical activities within the subject</p>	<p>Not applicable</p>

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