GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00070569		
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	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 inż. Aleksander Perliński	
	Teachers		

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

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

The aim of the course is to familiarise students with techniques for joining metal components in the context of design and fabrication.

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.	Student is aware of the key aspects of professional responsibility regarding the correct and safe design of connections.	[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.	Student can provide the information necessary to correct execution of the selected joint types	[SK4] Assessment of communication skills, including language correctness
[K6_U05] Conducts research (obtaining information, simulations, experimental methods) in the field of construction in order to solve specific tasks and report research results.	Student gathers information, including the results of scientific research, on methods of joining various materials used in civil engineering	[SU1] Assessment of task fulfilment
[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 has knowledge and understanding of the standards relating to the design and construction of selected joint types	[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.	Student is involved in gathering information relating to the design and construction of specific joint types	[SK5] Assessment of ability to solve problems that arise in practice

<table>
<tr><td>Subject contents</td><td>Course content – lecture
An overview of welding techniques used in construction.

An overview of the principles of designing and installing mechanical and bonded anchors.

An overview of the principles of designing and installing bolted tension joints.
Course content – project
1. Design exercise no. 1 - Bonded anchoring

2. Design exercise no. 2 - Bolted tension joint</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>desing exercise no. 1</td><td>60.0%</td><td>25.0%</td></tr>
<tr><td>desing exercise no. 2</td><td>60.0%</td><td>25.0%</td></tr>
<tr><td>written lecture test</td><td>60.0%</td><td>50.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>1. Bródka J. i Kozłowski A. (red.): Projektowanie i obliczanie połączeń i węzłów konstrukcji stalowych. Tom 1, PWT, Rzeszów 2009
2. Praca zbiorowa pod red. A. Kozłowskiego: Konstrukcje stalowe. Przykłady obliczeń według PN-EN 1993-1. Część pierwsza. Wybrane elementy i połączenia, Oficyna Wydawnicza PRz, Rzeszów 2009
3. Praca zbiorowa: Budownictwo ogólne. Tom 5, Arkady, Warszawa 2010
4. PN-EN 1992-4, Eurocode 2: Design of concrete structures. Part 4: Design of fastenings for use in concrete
5. PN-EN 1993-1-1 Eurocode 3: Design of steel structures Part 1.1: General rules and rules for buildings
6. PN-EN 1993-1-8 Eurocode 3: Design of steel structures - Part 1-8: Design of joints</td></tr>
<tr><td>Supplementary literature</td><td>1. EOTA, ETAG 001, Guideline for European technical approval of metal anchors for use in concrete, Annex C: Design methods for anchorage.
2. Mallee R., Fuchs W., Eligehausen R.: Design of Fastenings for Use In Concrete -- the CEN/TS 1992-4 Provisions, Ernst & Sohn, 2012
3. Information and design materials from company web pages: Rawlplug, Fischer, Hilti and others</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>Discuss selected arc welding methods.

Discuss how mechanical / bonded anchors work.

Discuss the failure mechanisms of bolted tension joints.</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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