GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Bridges and Tunnels, PG_00065730		
Field of study	Civil Engineering		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2025/2026
Education level	first-cycle studies	Subject group	
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish
Semester of study	6	ECTS credits	4.0
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	mgr inż. Maciej Malinowski	
	Teachers		

Lesson types

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	0.0	0.0	60

Subject objectives

- acquainted with basic principles of designing, shaping, calculation of bridge structures,
- acquainted with basin informations of building of bridges,
- acquainted with basic methods of diagnosis of brridges,

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U07] Design and build engineering structures in a sustainable manner, with care for the natural environment and a minimum carbon footprint	Ability to design/dimension basic structural elements of bridge structures	[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
[K6_U03] Design engineering objects and details, processes and engineering systems by applying appropriate standards and methods of design.	Designs objects and details in bridge construction, construction processes and systems, applying appropriate standards and design methods	[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [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.	Demonstrates knowledge and understanding of the processes and established standards and design methods for bridge construction and is aware of their limitations	[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge
[K6_W07] Understand the investment's impact on the environment and the interrelationships and dependencies between the building structure and the natural environment	Demonstrates understanding of the impact of investment on the environment and the interconnections and dependencies between the bridge structure and the natural environment	[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects

Subject contents

Course content – lecture

1. Basic information about bridges, definitions.
2. Classification of bridge structures.
3. History of bridges.
4. Catastrophes of bridges.
5. Loads and interactions.
6. Basic information about beam, plate, frame, arch, truss, suspension, cable-stayed, movable bridges and footbridges.
7. Basic information about foundation, supports and bridge equipment.
8. Bridge building technology.
9. Basic information about tunnels and culverts.
10. Diagnostics of bridge structures.

Prerequisites and co-requisites

knowledge of structural statics and strength of materials

knowledge of the basics of designing steel and concrete structures

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
exercises/project	60.0%	50.0%
lectures	53.0%	50.0%

Recommended reading

Basic literature

1. Malinowski M, Banaś A., Wasilewski B., Materiały do wykładu z Mostów i Tuneli
2. Malinowski M, Szafrański M., Sitarski A., Banaś A. Materiały pomocnicze do ćwiczeń z Mostów i Tuneli electronic version platform: eNauczanie.

Supplementary literature

1. Ryżyński A., Wołowicki W., Skarżewski J., Karlikowski J.: *Mosty stalowe*, PWN, Warszawa Poznań, 1984.
2. Szczygieł J.: *Mosty z betonu zbrojonego i sprężonego*. WKiŁ, Warszawa 1974 (1972).
3. Karlikowski J., Sturzbecher K.: *Mosty stalowe. Mosty belkowe i zespolone. Przewodnik do ćwiczeń projektowych* Politechnika Poznańska, Poznań, 2003.
4. Karlikowski J.,Madaj A., Wołowicki W.: *Mostowe konstrukcje zespolone stalowo-betonowe*. WKŁ, Warszawa 2007r.
5. Czudek H.: *Podstawy mostownictwa metalowego*, Politechnika Warszawska, Warszawa, 1997.
6. Hydzik J.: *Mosty kolejowe*, WKŁ, Warszawa, 1986.
7. Danielski L.: *Mosty metalowe*, Politechnika Wrocławska, Wrocław, 1983.
8. Cholewo J., Sznurowski M.: *Mosty kolejowe i fundamentowanie* ,WKŁ, Warszawa, 1965.
9. Korelewski J.: *Mosty stalowe*, Politechnika Krakowska, Kraków, 1980.
10. Szelągowski F.: *Mosty metalowe*, WKŁ, Warszawa, 1966.
11. Pszenicki A.: *Mosty stalowe nitowane*, Wydawnictwa Komunikacyjne, Warszawa, 1954.
12. Leonhardt F.: *Podstawy budowy mostów betonowych*. WKiŁ, Warszawa 1982.
13. Madaj A., Wołowicki W.: *Mosty betonowe*. WKiŁ, Warszawa 1998.
14. Madaj A., Wołowicki W.: *Budowa i utrzymanie mostów*. WKiŁ, Warszawa 1995.
15. Furtak K.: *Mosty Zespolone*. PWN, Warszawa 1999.
16. Siwowski T.: *Projektowanie mostów według Eurokodów*. Elamed 2016.
17. Siwowski T.: *Zastosowanie Eurokodów w projektowaniu mostów*. Oficyna Wydawnicza Politechniki Rzeszowskiej, 2016.
18. Siwowski T., Turoń B.: *Projektowanie mostów zespolonych według Eurokodu 4*. Oficyna Wydawnicza Politechniki Rzeszowskiej, 2016.
19. Karlikowski J., Madaj A., Wołowicki W.: *Mosty zespolone stalowo-betonowe. Zasady projektowania wg PN-EN 1994-2*. WKŁ 2016.
20. Machelski Cz.: Ruchome obciążenia obiektów mostowych. Dolnośląskie Wydawnictwo Edukacyjne 2015.

eResources addresses

Example issues/ example questions/ tasks being completed

Practical activites within the subject

Not applicable

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