GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Structural Mechanics / Statics II, PG_00062605		
Field of study	Civil Engineering		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2025/2026
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	4	ECTS credits	6.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Structural Mechanics -> Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Violetta Konopińska-Zmysłowska	
	Teachers	mgr inż. Łukasz Żmuda-Trzebiatowski dr inż. Marek Skowronek dr inż. Karol Winkelmann dr hab. inż. Violetta Konopińska-Zmysłowska dr inż. Magdalena Oziębło	

Lesson types							
	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	45.0	45.0	0.0	0.0	0.0	90
	E-learning hours included: 0.0						
	eNauczanie source address: https://enauczanie.pg.edu.pl/2025/course/view.php?id=3853 Moodle ID: 3853 Mechanika Budowli sem. IV inż. 2025/26 https://enauczanie.pg.edu.pl/2025/course/view.php?id=3853						

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	90	0.0	0.0	90

Subject objectives	Understanding of the behaviour of statically indeterminate structure, differences in behaviour of statically determinate and indeterminate rod structures. Ability to determine the displacements, internal forces, critical and limit loads, as well as influence lines in statically indeterminate systems. Use of influence lines in the design.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U05] Conducts research (obtaining information, simulations, experimental methods) in the field of construction in order to solve specific tasks and report research results.	The student recognizes the regimes of static structural performance, aware of the methods applied in the analysed case	[SU3] Assessment of ability to use knowledge gained from the subject
[K6_U02] Analyse & solve engineering issues & problems in the field of civil engineering by applying appropriate and relevant established analytical, numerical and experimental methods.	The student identifies and adjusts relevant solving methods for the problems of structural mechanics	[SU1] Assessment of task fulfilment
[K6_U01] Apply knowledge and understanding of mathematics as well as sciences and engineering disciplines underlying civil engineering to solve engineering problems and issues.	The student is provded with a valid background to statically analyse bar systems, to regard stabilty and structural limit states	[SU1] Assessment of task fulfilment
[K6_W02] Demonstrate knowledge and understanding of the processes and established methods of analysis / solution of engineering issues & problems in the field of civil engineering and of their limitations.	The student identifies structural models, the domain of bar structures, the methods to solve redundant systems and to analyze stability and limit state problems of structures	[SW1] Assessment of factual knowledge

Subject contents

Course content – lecture

Basic theorems in structural mechanics - the principle of virtual work of rigid and deformable bodies
Fundamentals of statically indeterminate bar structures, redundancy degree; displacements in determinate and indeterminate structures.
The force method and the slope and deflection method to analyse redundant systems
influence lines of statically indeterminate bar structures
Limit load-carrying capacity of planar beams and frames
Stability of planar bar systems

Course content – exercises

Displacements in determinate structures
The force method and the slope and deflection method to analyse redundant systems
Displacements in indeterminate structures
Influence lines of statically indeterminate bar structures
Limit load-carrying capacity of planar beams and frames
Stability of planar bar systems

Prerequisites and co-requisites

Completion of courses: General Mechanics, Strength of Materials

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
tests	60.0%	30.0%
exam	60.0%	70.0%

Recommended reading

Basic literature	Hibbeler Russell C.: Structural Analysis, Pearson Education Limited, 2019
Supplementary literature	not specified
eResources addresses	

Example issues/ example questions/ tasks being completed

Conduct static analysis of a redundant system by means of a specified or arbitrary method
Assess the buckling load of a given axially compressed system
Compute the limit load of a given system, match the relevant failure considering flexural impact only

Practical activites within the subject

Not applicable

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