



## Subject card

Subject name and code	Structural Analysis , PG_00044007						
Field of study	Civil Engineering						
Date of commencement of studies	October 2021		Academic year of realisation of subject		2022/2023		
Education level	first-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	2		Language of instruction		Polish		
Semester of study	4		ECTS credits		6.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Structural Mechanics Department -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Izabela Lubowiecka				
	Teachers		dr inż. Karol Winkelmann  dr inż. Marek Skowronek  dr inż. Magdalena Oziębło  dr hab. inż. Izabela Lubowiecka  dr inż. Violetta Konopińska-Zmysłowska  mgr inż. Łukasz Żmuda-Trzebiatowski				
Lesson types and methods of instruction	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						
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		7.0		53.0	150
Subject objectives	Understanding of the behaviour of statically indeterminate structure, differences in behaviour of statically determinate and indeterminate rod structures. Ability to determine the internal forces and influence lines in statically indeterminate systems. Use of influence lines in the design.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U03] can analyze simple rod constructions in scope of: calculations of constructions statically determined and undetermined; determining of modal frequencies; calculations of linear stability and bearing capacity in critical and boundary states		The student performs static analysis of statically determinate and indeterminate structures				
	[K6_W04] has knowledge of general mechanics, strength of materials and general rules of construction		The student is skillful in structural modelling, able to match an appropriate structural model, including the prediction of cross-sectional forces within				
	[K6_W05] knows laws of mechanics used in rod constructions in scope of statics and stability, has an elementary knowlege on dynamics		The student is acquainted with the rules of structural mechanics due to statics and stability. The student is given a theoretical background to analyse bar structures, matching a relevant method for a given problem				

Subject contents	Basic theorems in structural mechanics - the principle of virtual work of rigid and deformable bodies Fundamentals of statically indeterminate bar structures, redundancy degree 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		
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
	exam	60.0%	50.0%
	tests	60.0%	50.0%
Recommended reading	Basic literature	1. Branicki C.(red.): Zadania z Mechaniki Budowli, Tom II, Układy statycznie niewyznaczalne, Skrypt PG, 1976. 2. Cywiński Z.: Mechanika budowli w zadaniach Tom II, PWN, 1984 (i wydania późniejsze). 3. Dyląg Z., Krzemińska-Niemiec E.: Mechanika budowli, Tom 2 i 3, Wyd. Pol. Białostockiej 1993 (i wydania późniejsze). 4. Przewłocki J., Górski J.: Podstawy Mechaniki Budowli, Arkady, 2006 (i wydania późniejsze). 4. Praca zbiorowa: Mechanika Budowli z elementami ujęcia komputerowego, Tom 1 i 2, Arkady, 1984 (i wydania późniejsze). 5. Praca zbiorowa: Mechanika Budowli ujęcie komputerowe, Tom 1 i 2, Arkady, 1991/1992 (i wydania późniejsze).	
	Supplementary literature	not specified	
	eResources addresses	Adresy na platformie eNauczanie:	
	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	
Work placement	Not applicable		