



Subject card

Subject name and code	Finite element method - applicatios, PG_00041526						
Field of study	Civil Engineering						
Date of commencement of studies	February 2025		Academic year of realisation of subject		2025/2026		
Education level	second-cycle studies		Subject group		Optional subject group		
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	2		Language of instruction		English		
Semester of study	3		ECTS credits		3.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Katedra Wytrzymałości Materiałów -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Bartosz Sobczyk				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	0.0	0.0	30.0	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		5.0		40.0	75
Subject objectives	Selected aspects of modern applications of FEM in civil engineering practice						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W01] has knowledge of higher mathematics, physics and chemistry, which is a base of subjects, such as construction theory and advanced material technology		The student is able to analyze a specialist text concerning non-trivial problems in construction.		[SW3] Assessment of knowledge contained in written work and projects		
	[K7_U01] can evaluate and list any loads acting on constructions		The student is able to critically assess the load state adopted by the authors of the analyzed study.				
	[K7_W04] has knowledge on advanced strength of materials, modeling and optimisation of materials and constructions; has knowledge of fundamentals of Finite Element Method and general nonlinear analysis of engineering constructions and systems		The student is able to find common elements of his knowledge with the knowledge presented in the literature.		[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		
	[K7_U04] is able (using Finite Element Method), to define a calculation model and to perform advanced numerical analysis of complex constructions in: linear range and elementary nonlinear range, can critically evaluate the results of calculations.		The student is able to identify the tools necessary to solve advanced engineering problems, in particular, is able to choose numerical programs based on FEM.		[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools		
	[K7_U06] is able to choose proper tools (measuring, analytical or numerical) to solve engineering problems, to acquire, filtrate, proces and analyse data		The student is able to find the literature (scientific article, monograph, textbook) concerning the issue of interest to him.		[SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task		
Subject contents	Modeling of advanced engineering structures - presentations based on journal papers. Remarks on commercial FEM codes. Students presentations of FEM analysis in MSc thesis.						
Prerequisites and co-requisites	BSP020 or equivalent BSP021 or equivalent BSP022 or equivalent BSD048 or equivalent						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Seminar work	60.0%	100.0%
Recommended reading	Basic literature	1. RAKOWSKI G., KACPRZYK Z.: Metoda elementów skończonych w mechanice konstrukcji. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2005. 2. KLEIBER M (red).: Komputerowe metody mechaniki ciał stałych. Mechanika Techniczna t. XI. PWN, Warszawa 1995. 3. DACKO M., BORKOWSKI W., DOBROCINSKI S., NIEZGODA T., WIECZOREK M.: Metoda elementów skończonych w mechanice konstrukcji. Arkady Warszawa 1994. 4. ZIENKIEWICZ O.C.: Metoda elementów skończonych. Arkady 1972, lub nowsze wydania w języku angielskim. 5. Selected scientific papers concerned with applications of FEM in practice	
	Supplementary literature	1. CHRÓSCIELEWSKI J., MAKOWSKI J., PIETRASZKIEWICZ W.: Statyka i dynamika powłok wielopłatowych. Nieliniowa teoria i metoda elementów skończonych. PAN IPPT, Biblioteka Mechaniki Stosowanej Serii A, monografie, Warszawa 2004. 2. KREJA I.: Mechanika Ośrodków Ciągłych. Wydawnictwo CURE, Politechnika Gdanska, Gdansk 2003.	
	eResources addresses	Adresy na platformie eNauczanie:	
	Example issues/ example questions/ tasks being completed	Present the coverage of the paper chosen for presentation, in the light of FEM applications	
Work placement	Not applicable		

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