



Subject card

Subject name and code	Finite Element Method, PG_00048233						
Field of study	Civil Engineering						
Date of commencement of studies	October 2021	Academic year of realisation of subject			2022/2023		
Education level	second-cycle studies	Subject group			Optional subject group		
Mode of study	Part-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			Polish		
Semester of study	3	ECTS credits			5.0		
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	dr inż. Dawid Bruski dr inż. Łukasz Pachocki dr inż. Bartosz Sobczyk					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	20.0	0.0	0.0	20.0	0.0	40
	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	40		5.0		80.0	125
Subject objectives	Student learns the basics of finite element method and learns how to use selected FEM codes.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[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		Student learns the basics of finite element method and learns how to use selected FEM codes.				
	[K7_U06] is able to choose proper tools (measuring, analytical or numerical) to solve engineering problems, to acquire, filtrate, proces and analyse data		Student learns the basics of finite element method and learns how to use selected FEM codes.				
	[K7_W03] knows basics of Continuum Mechanics, knows rules of static analysis, stability and dynamics of complex rod, shell and volume structures, both in linear and basic nonlinear regime		Student learns the basics of finite element method and learns how to use selected FEM codes.				
Subject contents	Lectures: Introduction to FEM, FEM basics, Basics of Continuum Mechanics, Definition of approximation and interpolation. Selected applications of FEM. Tutorials/Project: Student learns basic of Abaqus code and learns how to use it to solve simple problems in the field of analysis of civil engineering structures.						

Prerequisites and co-requisites	Structural Mechanics, Strength of Materials		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	laboratory test	60.0%	20.0%
	project	60.0%	50.0%
	lecture test	60.0%	30.0%
Recommended reading	Basic literature	<p>KLEIBER M.: Wprowadzenie do metody elementów skończonych. Bibl. Mech. Stosowanej IPPT PAN, PWN Warszawa 1989.</p> <p>CHRÓŚCIELEWSKI J., BURZYŃSKI S., DASZKIEWICZ K., SOBCZYK B., WITKOWSKI W.: Wprowadzenie do modelowania MES w programie Abaqus. Wyd. PG, Gdańsk 2014.</p>	
	Supplementary literature	<p>RAKOWSKI G., KACPRZYK Z.: Metoda elementów skończonych w mechanice konstrukcji. Oficyna Wyd. PW, Warszawa 2005.</p> <p>DACKO M., BORKOWSKI W., DOBROCIŃSKI S., NIEZGODA T., WIECZOREK M.: Metoda elementów skończonych w mechanice konstrukcji. Arkady Warszawa 1994.</p> <p>ZIENKIEWICZ O.C.: Metoda elementów skończonych. Arkady 1972 (i inne wydania w języku np. angielskim).</p> <p>CHRÓŚCIELEWSKI J., MAKOWSKI J., PIETRASZKIEWICZ W.: Statyka i dynamika powłok wielopłatowych. Nieliniowa teoria i metoda elementów skończonych. Bibl. Mech. Stosowanej IPPT PAN, Serii A, monografie, Warszawa 2004.</p> <p>BATHE K.J.: Finite Element Procedures in Engineering Analysis. Englewood Cliffs: PrenticeHall 1982.</p>	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		