DOCTORAL SCHOOL OF WROCŁAW UNIVERSITY OF SCIENCE AND TECHNOLOGY

SUPERVISOR/TEAM/ DECLARING/CONDUCTING COURSE: Smolnicki Tadeusz.
DEPARTMENT: Mechanical Department
SCIENTIFIC DISCIPLINE: Mechanical Engineering

COURSE CARD

Course name in Polish: Metoda elementów skończonych
Course name in English: Finite Elemente Method
Course language ~~Polish~~ / English*
University-wide general course type*:
The course is intended for all PhD students: YES / NO
1) BASIC COURSE
~~2) SPECIALIST COURSE~~
~~3) SEMINAR~~
~~4) HUMANISTIC COURSE~~
~~5) LANGUAGE~~

Subject code: MEQ100189W

* delete as applicable

	Lecture	Foreign language course	Seminar	Mixed forms
Number of hours of organized classes in university (ZZU)	**30**			
Grading	Exam	Exam	Oral presentation	Exam, inspection, evaluation classes

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Mathematical analysis and matrix algebra
2. Basics of mechanics
3. Ability to solve systems of algebraic equations

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COURSE OBJECTIVES

C1. Acquiring knowledge of the basics of the theory of the finite element method
C2. Acquiring the ability to define the appropriate model for FEM calculations.
C3. Ability to interpret the results of numerical calculations

PROGRAM CONTENTS

Form of classes – lecture (Lec)		Number of hours
Lec1	Introduction	1
Lec2	Assumptions of the finite element method	2
Lec3	Shape function	3
Lec4	Stiffness matrix	3
Lec5	Classification of finite elements	2
Lec6	Plane element	2
Lec7	Discretization rules	2
Lec8	Types of analysis	4
Lec9	Global stiffness matrix	2
Lec10	Frames and trusses	3
Lec11	Surface structures	3
Lec12	Volumetric structures	3
	Total hours:	**30**

Form of classes – foreign language course (Lng)		Number of hours
Lng1		
Lng2		
Lng3		
..		
	Total hours:	

Form of classes – seminar (Sem)		Number of hours
Sem1		
Sem2		
Sem3		
…		
	Total hours:	

Form of classes – mixed forms (mix)		Number of hours
Mix1		
Mix2		
Mix3		
…		
	Total hours	

TEACHING TOOLS USED
N1. lecture with the use of multimedia presentations N2. problem discussion N3. analysis and interpretation of numerical calculations presented by the teacher

ACHIEVED SUBJECT LEARNING OUTCOMES		
Type of learning outcome	Code of learning	Assessment of learning outcome

	outcome	
Knowledge	P8S_WG	Knowledge at an advanced level of FEM computer modelling and its impact on computational accuracy
Knowledge	P8S_WG	Knowledge at an advanced level of the theoretical fundamentals of the finite element method
…		
Skills	P8S_UW	Ability to choose the type of model, type of analysis and finite element selection to the problem
Skills	P8S_UW	Ability to select parameters of numerical analysis
…	P8S_UW	Ability to interpret FEM analysis results
Social competence		
Social competence		
…		

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Rusinski E., Czmochowski J., Smolnicki T.: Zaawansowana metoda elementów skończonych w konstrukcjach nośnych, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2000
[2] Zienkiewicz O.C.: Metoda elementów skończonych, Arkady 1972

SECONDARY LITERATURE:

[1] Rusiński E.: Zasady projektowania konstrukcji nośnych pojazdów samochodowych. Oficyna Wyd. PWr Wrocław 2002
[2] Rakowski G., Kacprzyk Z.: Metoda elementów skończonych w mechanice konstrukcji, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2005
[3] Szmelter J., Dacko M., Dobrociński S., Wieczorek M.: Metoda elementów skończonych w statyce konstrukcji, Arkady 1979
[4] Gawroński W., Kruszewski J., Ostachowicz W., Tarnowski K., Wittbrodt E.: Metoda elementów skończonych w dynamice konstrukcji, Arkady, Warszawa 1984
[5] Waszczyszyn Z., Cichoń Cz., Radwańska M.: Metoda elementów skończonych w stateczności konstrukcji, Arkady, Warszawa 1990
[6] Kleiber M.: Wprowadzenie do metody elementów skończonych, PWN, Warszawa-Poznań 1989

SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)

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