SYLLABUS

Course description

Course code	Course	**METODA ELEMENTÓW SKOŃCZONYCH II**		
MB/O/I/ST/C1A.7		**FINITE ELEMENT METHOD II**		
Language of instruction	English			
Academic year	2023/2024			
field of study:	Mechanical Engineering			
field of specialisation:	CAE Computer aided engineering			
Educational level	first-cycle studies			
Education profile	General academic			
Mode of study	full-time studies			
Semester(s)	5, 6			
Affiliation with a group of classes	Specialization module			
Course status	obligatory			
Types of classes, instruction hours, ECTS credits	Types of classes	Number of instruction hours	Number of ECTS credits	
	Lecture	15 [h]	4 ECTS	
	Classes	0 [h]		
	Lab	45 [h]		
Linkage of the course	with the education profile	Related to the conducted scientific activity in the discipline to which the field of study is assigned		
	with qualifications	It is used to acquire engineering competences by the student	4 ECTS	
	with science discipline	Mechanical engineering	4CTS	
Form of teaching	Traditional – classes organized at the University /classes conducted using distance learning methods and techniques			
Prerequisites	FEM I			
Department	Faculty of Mechanical Engineering			
Coordinator	Ph.D. K. Olejarczyk			
The website of the basic organizational unit	http://wm.uniwersytetradom.pl			
E-mail address, phone number of the coordinator	k.olejarczyk@uthrad.pl (48) 361-71-16			

LEARNING OUTCOMES, CURRICULUM CONTENT, TEACHING CLASSES, VERIFICATION OF LEARNING OUTCOMES

Learning Objective:	C1 - Calculations based on examples of linear and non-linear analysis using the finite element method (FEM). C2 - Calculations based on examples of problems in the field of stress-thermal and modal analysis using the finite element method (FEM).
Curriculum Content:	The content of classes is related to the conducted scientific research. Lecture content 5th semester: Discretization methods discussed. Contact issues. Discussion of issues related to linear, non-linear, modal, stress-thermal analysis. Content of laboratory exercises 5th semester Content of laboratory exercises Conducting comparative analyzes on various examples using 1D, 2D3D elements using the finite element method. Content of laboratory exercises 6th semester:Performing stress analyzes in the linear and non-linear range. Performing stress-thermal analyses. Performing a modal analysis. Conducting an analysis of the contact issue.
Didactic (educational) methods:	Didactical methods - feeding methods (informative lecture), − programmed methods (using a computer), − practical methods (demonstration)
Course assessment type, the criteria for assessing the achieved learning outcomes, and the method of calculating the final grade:	The condition for passing the course is to achieve all the required learning out comes specified for the course.

Learning outcomes for the course in relation to the field of study learning outcomes and the type of classes				Methods of verifying learning outcomes	
Learning outcome number	Description of the learning outcomes for the course (PEU) A student who has passed the course (**W**) knows and understands / (**U**) can / (**K**) is ready to:	Field of study learning outcome (KEU)	Types of classes	Form of verification (credits)	Methods of testing and assessment
W1	has knowledge of the theoretical foundations of the finite element method (FEM) and its application to the static and strength calculations of bar structures	K_WG04	Lecture, Laboratory exercises	Project/Test	Project/Test
U1	is able to perform strength calculations of bar structures (trusses, beams, frames) using the finite element method and using a computer program implementing FEM	K_UW02 K_UW13	Lecture, Laboratory exercises	Project/Test	Project/Test
K1	is able to analyze the tasks assigned to perform and is able to cooperate and work in a group.	K_KO04	Lecture, Laboratory exercises	Project/Test	Project/Test

Literature and teaching aids
1. Król K., Metoda elementów skończonych w obliczeniach konstrukcji, Wydawnictwo Politechniki Radomskiej, Radom, 2006. 2. Rakowski G., Kacprzyk Z., Metoda elementów skończonych w mechanice konstrukcji, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 1993. 3.Zienkiewicz O. C., Taylor R. L., The Finite Element Method , I: The Basis, Butterworth-Heinemann, Oxford, 2000. Programs that perform calculations using the finite element method

Student workload required to achieve the assumed learning outcomes – the balance of ECTS credits			
Attendance, participation	Student workload [h].		
	Other contact hours (IGK)	Student's self-study hours Classes without a teacher (ZBN)	Classes
Participation in lectures/classes/lab	X	X	15[h]/0[h]/45[h]
Meeting with teachers during their duty hours	5 [h]	X	X
Preparation for lectures/classes/lab , Preparation for ... credit / exam	X	8[h]/0[h]/30[h] 10[h]	X
Total student workload	5 [h]/ 0,2 ECTS	35 [h]/ 1.4ECTS	60 [h]/ 2.4 ECTS
ECTS credits for the course	100 [h] / 4 ECTS		

Additional information, comments
In the case of students with special needs, including disabilities, and chronic illnesses, the methods and forms of verification of learning outcomes specified above (in the syllabus) are adapted to the individual needs of these students, as appropriate. Detailed rules and forms of support for students with special needs, including those with disabilities and chronically ill, during classes, credits, and exams are specified in: University Regulations (Regulamin Studiów Uniwersytetu Technologiczno-Humanistycznego w Radomiu), Study Regulations (Zasady Studiowania), and Procedure for Ensuring Accessibility of the Educational Process to Students with Special Needs, Including Those with Disabilities and Chronically ill (Procedura dotycząca zapewnienia dostępności procesu kształcenia studentom ze szczególnymi potrzebami, w tym: z niepełnosprawnością, przewlekle chorych).