Course description

Course code	Course	**ZASTOSOWANIA SYSTEMÓW CAD/CAE**
MB/O/I/NST/C1A.17		**APPLICATION OF CAD/CAE SYSTEMS**
Language of instruction		English
Academic year		2023/2024
field of study:		Mechanics and machine construction
field of specialisation:		CAE Computer Aided Engineering
Educational level		First-cycle studies
Education profile		General academic
Mode of study		Part-time studies
Semester(s)		7
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	-- [h]	
	Classes	-- [h]	2 ECTS
	Project	16 [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 (general academic profile)	2 ECTS
	with qualifications	serves the student to acquire engineering competences	2 ECTS
	with science discipline	Mechanical Engineering	2 ECTS
Form of teaching		Traditional – classes organized at the University /classes conducted using online learning methods and techniques	
Prerequisites		knowledge in mathematics, mechanics, strength of materials, FEM, CAD	

Department	Department of Applied Mechanics and Mechatronics
Coordinator	PhD Marcin Wikło
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LEARNING OUTCOMES, CURRICULUM CONTENT, TEACHING CLASSES, VERIFICATION OF LEARNING OUTCOMES

Learning Objective:	C1 - Extension of skills related to FEM simulation, C2 - To consolidate and deepen knowledge of technical mechanics and strength of materials oriented towards practical tasks
Curriculum Content:	The content of the classes is related to the conducted scientific research. **Content of project exercises** Preliminary organizational activities: familiarization with the rules applicable in the classes, the applicable form of passing the course and a general outline of the material applicable to students. Summary of the CAD/CAE design approach – CAD software, CAE software, integration methods on the example of Ansys Discovery and Fusion 360 software. Presentation of the approach to design coupled with simulation - disadvantages, advantages, possibilities. Execution of projects, taking into account various scenarios of construction and load
Didactic (educational) methods:	Project exercises
Course assessment type, the criteria for assessing the achieved learning outcomes, and the method of calculating the final grade:	Project exercises - Average obtained by the student from grades for: project 70%, evaluation of work in classes 30%

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	It uses the steps necessary to build a computational model. It uses software to solve problems with mechanics and strength of materials.	K_WG01, K_WG02, K_WG05, K_WG17	projekt	Execution of projects	Evaluation of the correctness of project implementation
U1	He can perform numerical calculations for various types of mechanics, interprets the obtained results. Can choose software depending on the complexity of the problem.	K_UW08, K_UW09, K_UK16, K_UO19 K_UU21	projekt	Execution of projects	Evaluation of the correctness of project implementation
K1	Is able to cooperate and act in a group and understands the non-technical aspects of the mechanical engineer's activities, including the impact on the environment. Demonstrates creativity in the process of calculation. Demonstrates responsibility related to the calculations performed and the ethics of presenting results.	K_KK01, K_KK02, K_KO04, K_KR07	projekt	Verbal assessment	Verbal assessment

Literature and teaching aids
1. Daniel Inman, Engineering Vibrations, Pearson Education, Inc.; (2008) English
2. Rakowski G., Kacprzyk Z., Metoda elementów skończonych w mechanice konstrukcji, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 1993.
4. Jacek Stadnicki, Teoria i praktyka rozwiązywania zadań optymalizacji z przykładami zastosowań technicznych, Wydawnictwo WNT
5. Ansys manual
6. Fusion manual

Student workload required to achieve the assumed learning outcomes – the balance of ECTS credits			
	Student workload [h].		
Attendance, participation	Other contact hours (IGK)	Student's self-study hours Classes without a teacher (ZBN)	Classes
Participation in projects	X	X	30[h]
Meeting with teachers during their duty hours	6 [h]	X	X
Preparation for lectures/classes/.... , Preparation for ... credit / exam	X	28[h]	X
Total student workload	6 [h]/ 0.3 ECTS	28 [h]/1.1 ECTS	16[h]/ 0.6 ECTS
ECTS credits for the course	50 [h]/ 2 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).