

SYLLABUS

Course description

Course description				
Course code		Course	Pakiety Oprogramowania w Mechanice	
ME/O/I/ST/C4b			Software packages in mechanics	
Language of instruction		English		
Academic year		2025/2026		
field of study:		Mechanical Engineering		
field of specialisation:		All		
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		C. Group of courses to choose from		
Course status		Electable		
Types of classes, instruction hours, ECTS credits		Types of classes	Number of instruction hours	Number of ECTS credits
		Lecture	30 [h]	9 ECTS
		Classes	0 [h]	
		Lab	75 [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		ECTS
	with qualifications	It is used to acquire engineering competences by the student		9 ECTS
	with science discipline	Mechanical engineering		ECTS
Form of teaching		Traditional – classes organized at the University /classes conducted using distance learning methods and techniques		
Prerequisites		knowledge of mechanics (statics) and mathematics		
Department		Faculty of Mechanical Engineering		
Coordinator		dr inż. Roman Król		
The website of the basic organizational unit		http://wm.uniwersytetradom.pl		
E-mail address, phone number of the coordinator		r.krol@uthrad.pl, +48 361 71 12		

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

Learning Objective:	C1 – the aim of the course is to obtain skills in using the numerical computations software used to analyse machines and structures, verification of results computed in the Finite Element
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	Analysis Software, interpretation of the differences between obtained numerical analysis results and the theoretical verification C2 – improving the skills in using various CAE software used in the mechanical engineering
Curriculum Content:	<p>The course curriculum is related to the scientific research performed in the Faculty of Mechanical Engineering.</p> <p>Laboratory exercises:</p> <p>To inform students about the rules and duties during the laboratory tasks and course tests. Presentation of the popular finite element analysis software facilities including ANSYS Mechanical and Inventor Nastran. Presentation of the geometry modifications, mesh generation and boundary conditions definition. Performing series of laboratory task and presentation of new CAE software. The laboratory tasks include topics of contact modeling, hinge definition, using symmetry and axisymmetric models. Presentation of the direct and parametric definition of the geometry. Improved mesh generation techniques and solution of static and dynamic models. Presentation of the export and import facilities in the CAE and FEA software.</p>
Didactic (educational) methods:	Traditional, tasks in the computer laboratory
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 computer-aided design, manufacturing and operation of mechanical, mechatronic and equipment;	K_WG11	Lecture/ Lab	Test, laboratory tasks	Laboratory project
W2	has knowledge of numerical methods used in simulation and analysis of mechanical systems, as well as in the process of their design, manufacturing and operation;	K_WG17	Lecture/ Lab	Test, Laboratory tasks	Laboratory project
U1	can use analytical, simulation and experimental methods to formulate and solve engineering tasks.	K_UW02	Lab	Laboratory tasks	Laboratory project
K1	is ready to complete and critically evaluate specialized knowledge and is able to select sources of knowledge and methods of learning appropriate for himself/herself and others;	K_KK01	Lab	Laboratory tasks	Laboratory project
K2	is willing to comprehensively analyze and effectively carry out assigned tasks, and in the event of difficulties in solving them, use expert opinion;	K_KK02	Lecture/ Lab	Verbal exam, Laboratory tasks	Answering questions

Literature and teaching aids
<p>Primary literature:</p> <ol style="list-style-type: none"> 1. ANSYS Mechanical manual 2. Inventor Nastran help center documentation 3. Król K., Metoda elementów skończonych w obliczeniach konstrukcji, Wydawnictwo Politechniki Radomskiej, Radom, 2006

4. Rakowski G., Kacprzyk Z., Metoda elementów skończonych w mechanice konstrukcji, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 1993
5. Łaczek S. Przykłady analizy konstrukcji w systemie Mes Ansys-Workbench PKRW 2012

Additional literature:

1. G. Nikishkov, Programming Finite Elements in Java, Springer, 2013
2. A. Anandarajah, Computational methods in Elasticity and Plasticity, Springer, 2013

Study aids:

Student workload required to achieve the assumed learning outcomes – the balance of ECTS credits		
Attendance, participation	Student workload [h].	
	Student's self-study hours Classes without a teacher (ZBN)	Classes
Participation in lectures/classes/lab	X	105 [h]
Preparation for lectures/classes/lab , Preparation for ... credit / exam	120 [h]	X
Total student workload Preparation for ... credit / exam	120 [h]/ 4.8 ECTS	105 [h]/ 4.2 ECTS
ECTS points per subject	9 ECTS	

Additional information, comments
<p>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.</p> <p>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, przewlekłe chorych).</p>

