SYLLABUS

Course description

<table>
<tr><td>Course code</td><td rowspan="2">Course</td><td>MODELOWANIE I ANALIZA KONSTRUKCJI</td></tr>
<tr><td>MB/O/I/ST/C2A.16</td><td>MODELING AND ANALYSIS OF CONSTRUCTION</td></tr>
<tr><td>Language of instruction</td><td colspan="2">English</td></tr>
<tr><td>Academic year</td><td colspan="2">2023/2024</td></tr>
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field of study:	Mechanical engineering
field of specialisation:	Designing and Manufacturing of Machines
Educational level	first-cycle studies
Education profile	General academic
Mode of study	Full-time studies
Semester(s)	6

<table>
<tr><td colspan="2">Affiliation with a group of classes</td><td colspan="3">Specialization module</td></tr>
<tr><td colspan="2">Course status</td><td colspan="3">obligatory</td></tr>
<tr><td colspan="2" rowspan="3">Types of classes, instruction hours, ECTS credits</td><td>Types of classes</td><td>Number of instruction hours</td><td>Number of ECTS credits</td></tr>
<tr><td>Lecture</td><td>30 [h]</td><td rowspan="2">4 ECTS</td></tr>
<tr><td>Laboratory</td><td>30 [h]</td></tr>
<tr><td rowspan="3">Linkage of the course</td><td>with the education profile</td><td colspan="2">related to scientific activity in the discipline to which the field of study</td><td>4 ECTS</td></tr>
<tr><td>with qualifications</td><td colspan="2">obtaining engineering competencies</td><td>4 ECTS</td></tr>
<tr><td>with science discipline</td><td colspan="2">mechanical engineering</td><td>4 ECTS</td></tr>
<tr><td colspan="2">Form of teaching</td><td colspan="3">Traditional – classes organized at the University /classes conducted using online learning methods and techniques</td></tr>
<tr><td colspan="2">Prerequisites</td><td colspan="3">News in the field: Fundamentals of mechanical engineering, mechanics, theory of mechanisms and machines, Mathematical</td></tr>
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Department	Faculty of Mechanical Engineering
Coordinator	Professor Wojciech Żurowski
The website of the basic organizational unit	www.wm.uniwersytetradom.pl
E-mail address, phone number of the coordinator	wojciech.zurowski@uthrad.pl, phone: 48 3617615

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

Learning Objective:	C1-acquisition of skills in using basic methods and tools to solve simple engineering problems C2-acquisition of skills in applying engineering analysis in mechanical engineering issues C3-acquisition of skills in presenting the results of engineering analysis
Curriculum Content:	The content of classes is related to the conducted scientific research. **Lecture:** Modeling of kinematic systems With one degree of freedom. Determination of reduced values. Dynamic equation of motion of a kinematic system With one degree of freedom. Transition states in kinematic systems. Design analysis using selected CAD program modules. Static modeling and framework analysis. Analysis of machine components and their assemblies using FEM. Use of computational modules for bearing analysis and selection. Analysis and modeling of gear and synchronous belt drives. Synthesis of cam mechanisms. **Content of laboratory classes:** modeling of kinematic systems With one degree of freedom (determination of reduced values). Dynamic equation of motion of a kinematic system With one degree of freedom (calculation of the motor system). Transition states in kinematic systems. Static modeling and framework analysis. Analysis of machine components and their assemblies using FEM. Use of computational modules for bearing analysis and selection. Analysis and modeling of gear and synchronous belt drives. Synthesis of cam mechanisms.
Didactic (educational) methods:	- informational lecture using audio-visual means, - project method using CAD computer systems - laboratory method of the project using CAD computer systems
Course assessment type, the criteria for assessing the achieved learning outcomes, and the method of calculating the final grade:	Final score from CW. proj. this is the sum of grades: 40% of the colloquium, 50% of project work, and 10% of classroom activity.

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	The student has a simple knowledge of the principles of mechanical design; basic knowledge of development trends in machine design and production;	K_WG09	lecture	test assessment test	verification
W2	The student knows the basic tools needed to solve engineering problems from the field of mechanical engineering; has a simple knowledge of methods for modeling and analyzing mechanical systems;	K_WG11 K_WG16 K_WG17	lecture	test assessment test	verification
U1	The student is able to analyze calculations before starting work; can be used to formulate and solve engineering problems in the field of machine design calculation and modeling methods; is	K_UW09	lecture laboratories	test assessment test	project verification

	able to evaluate the usefulness of routine methods and tools used to solve a simple analysis problem and is able to choose and apply the correct method and tool;				
U2	Student can perform basic engineering analyses and uses computer programs for design; can present the results of engineering analysis; can communicate using various methods in a professional environment, as well as in other environments	K_UW12	lecture laboratories	test assessment test	project verification

Literature and teaching aids
1. Lucjan T. Wrotny: Kinematyka i dynamika maszyn technologicznych i robotów przemysłowych, Wyd. Politechniki Warszawskiej, Warszawa 1996 2. Lucjan T. Wrotny: Zadania z kinematyki i dynamiki maszyn technologicznych i robotów przemysłowych, Wyd. Politechniki Warszawskiej, Warszawa 1998 3. Lucjan T. Wrotny: Dynamika układów mechanicznych : repetytorium teoretyczne i zadania, Wyd. Politechniki Warszawskiej, Warszawa 1995 4. Andrzej Jaskulski - Autodesk Inventor 2011PL/2011 Metodyka projektowania, Wydawnictwo Naukowe PWN 2011 5. Andrzej Jaskulski - Autodesk Inventor Professional / Fusion 2012PL/2012+ Metodyka projektowania, Wydawnictwo Naukowe PWN 2012 6. Paweł Maciąg - Autodesk Inventor ćwiczenia, Politechnika Radomska, Wydawnictwo 2008

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	X	X	30 [h]
Participation in .... classes/laboratory classes	X	X	30[h]
Meeting with teachers during their duty hours	15 [h]	X	X
Preparation for lectures/classes/.... , Preparation for ... credit / exam	X	20 [h] 15 [h]	X
Total student workload	5 [h] / 0,2 ECTS	35 [h]/ 1,4 ECTS	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 (RegulaminStudiówUniwersytetuTechnologiczno-Humanistycznego w Radomiu), Study Regulations (ZasadyStudiowania), and Procedure for Ensuring Accessibility of the Educational Process to Students with Special Needs, Including Those with Disabilities and Chronically ill (Procedura dotyczącaza pewnie niadostępności procesu kształcenia studentom ze szczególnymi potrzebami, w tym: z niepełnosprawnością, przewleklechorych).