

SYLLABUS

Course description

| Course description | | | | |
|---------------------------------------------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------|------------------------|
| Course code | | Course | TEORIA MECHANIZMÓW I MASZYN | |
| MB/O/I/ST/C2A.12 | | | MECHANISMS AND MACHINES THEORY | |
| Language of instruction | | English | | |
| Academic year | | 2023/2024 | | |
| 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 study | | |
| Semester(s) | | 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 |
| | | Lectures | 15 [h] | 3 ECTS |
| | | Project | 30 [h] | |
| Linkage of the course | with the education profile | related to the scientific activity carried out in the discipline that it belongs to course of study (general academic profile) | | 3 ECTS |
| | with qualifications | it is used for obtaining the student's competence engineering services | | 3 ECTS |
| | with science discipline | Mechanical engineering | | 3 ECTS |
| Form of teaching | | Traditional – classes organized at the University /classes conducted using online learning methods and techniques | | |
| Prerequisites | | Basic knowledge and skills in mathematics, fundamentals of mechanical engineering and mechanics | | |
| Department | | Faculty of Mechanical Engineering | | |
| Coordinator | | Tomasz Mazur PhD .Eng. | | |
| The website of the basic organizational unit | | www.wm.uniwersytetradom.pl | | |
| E-mail address, phone number of the coordinator | | Tomasz.mazur@uthrad.pl phone :76-86 | | |

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

| | |
|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective: | C1-acquisition of skills in analyzing issues related to technical implementation of the movement of typical mechanisms, car motion control and dynamic issues related to the movement of mechanisms and machines. C2-Acquisition of skills in applying engineering analysis in the following areas: questions of mechanical engineering. C3-acquisition of skills in presenting analysis results engineering services |
| Curriculum Content: | The content of classes is related to the conducted scientific research. Lectures: Basic concepts of structural analysis of mechanisms. Kinematic pair. Kinematic chain. Chain mobility kinematic. Analytical and graphical methods for determining the paths, velocities, and accelerations of points in lever mechanisms. Analytical and numerical methods of kinematic analysis of lever mechanisms. Kinetostatics of lever flat mechanisms. Balancing mechanisms and machines. Energy balance of the car. Driving periods. Mechanical efficiency. Reduced dynamic values. The equation of motion of the car. Study of machine movement under the action of forces. Uneven running of the car. Flywheel. Cam mechanisms. Synthesis of cam mechanisms. Gear mechanisms. Traffic mechanisms intermittent. Spatial mechanisms. Kinematic systems of manipulators. Content of design classes: Structural analysis of a flat lever mechanism. Determination of the speed and acceleration of the links of a flat lever mechanism. Kinetostatic analysis of a flat lever mechanism with consideration of friction problems in kinematic nodes. |
| Didactic (educational) methods: | information lecture, project method |
| Course assessment type, the criteria for assessing the achieved learning outcomes, and the method of calculating the final grade: | The condition for passing the subject is to meet all the required requirements. required learning outcomes defined for the subject. Lectures - Score for the final test. Project exercises - Final assessment of the project task, taking into account the correctness, variability, independence and timeliness of its implementation. |

| 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 methods and algorithms structural, kinematic analysis and dynamic movement-related typical mechanisms used in construction havesZin. | K_WG09 | lectures | test for evaluation purposes | test |
| U1 | The student knows how to correctly model the structural elements of typical mechanisms, applied in mechanical engineering, and conduct its analysis. | K_UW08 | workout design | test for evaluation purposes | project test |
| U2 | The student can build a mathematical model describing the kinematic and dynamic parameters of the mechanism, solve it, and analyze the results obtained. | K_UW02 K_UW08 | workout design | test for evaluation purposes | project test |
| K1 | The student is aware of the need for lifelong learning and can choose the right teaching methods for themselves and others | K_KR05 | workout design | conversation | conversation |

| Literature and teaching aids |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. John Uicker J., Pennock G., Shigley J.: Theory of Machines and Mechanisms. Oxford University Press. 2010 2. R.S. Khurmi, J.K. Gupta: Theory of Machines. S Chand 2015 3. Thomas Bevan, The Theory of Machines. CBS Publishers & Distributors Pvt Ltd 2005 4. McKay Robert Ferrier: The Theory of Machines. Wentworth PR 2016 |

| 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 | 15 [h] |
| Participation in classes/laboratory classes | X | X | 30 h] |
| Meeting with teachers during their duty hours | 2 [h] | X | X |
| Preparation for lectures/classes/.... , Preparation for ... credit / exam | X | 15 [h] 13 [h] | X |
| Total student workload | 2 [h]/ 0,1 ECTS | 28 [h]/1,1 ECTS | 45 [h]/ 1,8 ECTS |
| ECTS credits for the course | 75 [h]/3 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, przewlekle chorych).</p> |

