

SYLLABUS

Course description

| | | | | |
|---|---|---|------------------------|--------|
| Course code | Course | PAKIETY OPROGRAMOWANIA W MECHANICE | | |
| MB/O/I/NST/C1A.8 | | CAE SYSTEMS IN MECHANICS | | |
| Language of instruction | English | | | |
| Academic year | 2023/2024 | | | |
| field of study: | Mechanics and machine construction | | | |
| field of specialisation: | CAE | | | |
| Educational level | first-cycle studies | | | |
| Education profile | General academic | | | |
| Mode of study | part-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 | [h] | 4 ECTS | |
| | Classes | [h] | | |
| | Laboratories | 32 [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; | | 4 ECTS |
| | with qualifications | serves the student to acquire engineering competences | | 4 ECTS |
| | with science discipline | Mechanical Engineering | | 4 ECTS |
| Form of teaching | Traditional – classes organized at the University /classes conducted using online learning methods and techniques | | | |
| Prerequisites | Knowledge and skills acquired in the subjects: mathematics, mechanics, strength of materials, basics of FEM | | | |
| Department | Faculty of Mechanical Engineering | | | |
| Coordinator | PhD Marcin Wikło | | | |
| The website of the basic organizational unit | www.wm.uniwersytetradom.pl | | | |
| E-mail address, phone number of the coordinator | m.wiklo@uthrad.pl, phone 361- 71-16 | | | |

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

| | |
|---|--|
| Learning Objective: | C1 – the aim of the course is to acquire the ability to use software for numerical calculations, verification obtained results with the software for the Method Finite Elements (FEA), interpretation of differences resulting from the adopted assumptions. C2 – the aim of the course is to acquire knowledge and practice in the field of various CAE programs |
| Curriculum Content: | The content of the classes is related to the conducted scientific research Content of laboratory 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. Presentation of the capabilities of the software, Ansys Mechanical and Nastran InCad including geometry modifications, mesh generation and boundary conditions. A series of exercises presenting the capabilities of the new CAE software: modeling of contact, joints, symmetry, axial symmetrical models. Presentation of the idea of creating direct and parametric modeling, advanced creation of FEM meshes and basic static and dynamic calculations. Import/export capabilities of results and co-simulations |
| Didactic (educational) methods: | Laboratory exercises |
| Course assessment type, the criteria for assessing the achieved learning outcomes, and the method of calculating the final grade: | Average obtained by the student from grades for projects and from colloquia |

| 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 | Correctly classifies the steps of calculations performed in various MES systems. It uses software to solve problems with mechanics and strength of materials. | K_WG01 K_WG04 K_WG09 | laboratory | project | Made Projects Colloquia |
| W2 | Classifies and identifies the basic elements of optimization: goal function, constraints, and decision variables. | K_WG01 K_WG06 K_WG17 | laboratory | project | Made Projects Colloquia |
| U1 | Can perform numerical calculations for member elements, interprets the obtained results, compares them with MES software. | K_UW08 K_UW14 | laboratory | project | Made Projects Colloquia |
| U2 | Can formulate an optimization task, run calculations and interpret optimization results. | K_UW02 K_UW03 K_UK16 | laboratory | project | Made Projects Colloquia |
| K1 | Is able to collaborate and act in a group and understands the non-technical aspects of the mechanical engineer's activities, including environmental impact | K_KK01 K_KO02 K_KO04 | laboratory | project | Made Projects Colloquia |

| Literature and teaching aids |
|--|
| 1. Ansys manual 2. Nastran in Cad manual 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. Łączek S. Przykłady analizy konstrukcji w systemie Mes Ansys-Workbench PKRW 2012 |

| 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 laboratory classes | X | X | 32[h] |
| Meeting with teachers during their duty hours | 2 [h] | X | X |
| Preparation for classes, Preparation for credit | X | 53[h] 10[h] | X |
| Total student workload | 2 [h]/ 0,1 ECTS | 66 [h]/2,6 ECTS | 32 [h]/ 1,3 ECTS |
| ECTS credits for the course | 100[h] / 4 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> |

