COURSE DESCRIPTION CARD – SPECIMEN

<table>
<tr><td colspan="10">Faculty of Mechanical Engineering</td></tr>
<tr><td>Field of study</td><td colspan="6"></td><td>Degree level and programme type</td><td>Bachelor's degree</td></tr>
<tr><td>Specialization/ diploma path</td><td colspan="6"></td><td>Study profile</td><td></td></tr>
<tr><td rowspan="2">Course name</td><td colspan="6" rowspan="2">Computer Engineering Analysis</td><td>Course code</td><td>IS-MER0036S</td></tr>
<tr><td>Course type</td><td></td></tr>
<tr><td rowspan="2">Forms and number of hours of tuition</td><td>L</td><td>C</td><td>LC</td><td>P</td><td>SW</td><td>FW</td><td>S</td><td>Semester</td><td>summer</td></tr>
<tr><td></td><td></td><td></td><td>30</td><td></td><td></td><td></td><td>No. of ECTS credits</td><td>4</td></tr>
<tr><td>Entry requirements</td><td colspan="9">Computer Aided Design</td></tr>
<tr><td>Course objectives</td><td colspan="9">To familiarize students with the capabilities of today's CAE systems. Teaching the basics of verification using CAE techniques. Practical solving of engineering problems using CAE tools. Presentation of finite element method and the use in the design process. Creation FEM study using: beam, shell and solid finite elements.</td></tr>
<tr><td>Course content</td><td colspan="9">CAE terminology. Validation process of design. Principles and types of analysis in CAx systems. Verification problems of mechanical systems in machine building. Commercial CAE systems. Static analysis in mechanical problems. Types of mesh of CAD models. Results interpretation: stress, strain, displacement, factor of safety. Methods of results presentation. Background of SolidWorks Simulation. Types of validation of 3D models in SolidWorks environment. Various mesh options in verification problems. Carried out selected mechanical problems and their virtual simulation. Preparation and interpretation of results.</td></tr>
<tr><td>Teaching methods</td><td colspan="9">project</td></tr>
<tr><td>Assessment method</td><td colspan="9">project – assessment of report</td></tr>
<tr><td>Symbol of learning outcome</td><td colspan="7">Learning outcomes</td><td colspan="2">Reference to the learning outcomes for the field of study</td></tr>
<tr><td>LO1</td><td colspan="7">student: classifies types of CAE analyses</td><td colspan="2"></td></tr>
<tr><td>LO2</td><td colspan="7">knows tools for veryfication of mechanical project</td><td colspan="2"></td></tr>
<tr><td>LO3</td><td colspan="7">can create FEM study of basic mechanical parts or simple mechanical system</td><td colspan="2"></td></tr>
<tr><td>LO4</td><td colspan="7">solve static study, discretize CAD model using: beam, shell and solid finite elements</td><td colspan="2"></td></tr>
<tr><td>LO5</td><td colspan="7">is able to create buckling analysis</td><td colspan="2"></td></tr>
<tr><td>LO6</td><td colspan="7">can modify CAD model, boundary condition or kind of material for</td><td colspan="2"></td></tr>
</table>

	obtaining assumed factor of safety or condition of stiffness	
LO7	can define user izotripic material and use it to FEM study	
Symbol of learning outcome	**Methods of assessing the learning outcomes**	**Type of tuition during which the outcome is assessed**
LO1	**assessment of report, discussion during class**	**P**
LO2	**assessment of report, discussion during class**	**P**
LO3	**assessment of report, discussion during class**	**P**
LO4	**assessment of report, discussion during class**	**P**
LO5	**assessment of report, discussion during class**	**P**
LO6	**assessment of report, discussion during class**	**P**
LO7	**assessment of report, discussion during class**	**P**
Student workload (in hours)		**No. of hours**
Calculation	participation in project	30
	preparation for projects	15
	working on projects	15
	participation in student-teacher sessions related to the project	5
	implementation of project tasks	30
	preparation for and participation in exams/tests	5
	TOTAL:	**100**

Quantitative indicators	**HOURS**	**No. of ECTS credits**
Student workload – activities that require direct teacher participation	**30**	**1,5**
Student workload – practical activities	**60**	**2,5**

Basic references	**1. SolidWorks Simulation, DS SolidWorks Corporation, 2020** **2. SolidWorks Simulation Professional, DS SolidWorks Corporation, 2020** **3. Darbyshire A.: Mechanical Engineering, Elsevier, 2010**
Supplementary references	**1. Kurowski P.: Engineering Analysis with SolidWorks Simulation 2020, SDC Publications** **2. Steffen J.R. : Analysis of Machine Elements Using SolidWorks Simulation 2017, SDC Publications** **3. youtube tutorials**

Organisational unit conducting the course	**Department of Mechanical Engineering and Machine Operation**	**Date of issuing the programme**
Author of the programme	**Andrzej Łukaszewicz. PhD**	**22.03.2021**

L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work, S – seminar