COURSE DESCRIPTION CARD – SPECIMEN

<table>
<tr><td colspan="10">Faculty of Mechanical Engineering</td></tr>
<tr><td>Field of study</td><td colspan="5">Erasmus</td><td colspan="2">Degree level and programme type</td><td>Bachelor’s degree</td></tr>
<tr><td>Specialization/ diploma path</td><td colspan="5">-</td><td colspan="2">Study profile</td><td>-</td></tr>
<tr><td rowspan="2">Course name</td><td colspan="5" rowspan="2">Kinematics and Dynamics of Machines</td><td colspan="2">Course code</td><td>IS-FME-00132S
IS-FME-00132W</td></tr>
<tr><td colspan="2">Course type</td><td>obligatory</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 colspan="2">Semester</td><td>Winter/summer</td></tr>
<tr><td>30</td><td></td><td></td><td>30</td><td></td><td></td><td></td><td colspan="2">No. of ECTS credits</td><td>4</td></tr>
<tr><td>Entry requirements</td><td colspan="9">Engineering Mechanics I</td></tr>
<tr><td>Course objectives</td><td colspan="9">To provide the students with methods of kinematic and dynamic analysis of machines</td></tr>
<tr><td>Course content</td><td colspan="9">Lecture: Introduction to Kinematic and Dynamics, Degree of Freedoms and nodes, determine of velocity and acceleration of mechanism: graphical method, Fundamentals of Rigid and Flexible Mechanism, Dynamics Modelling, Holomonic and Nonholomonic systems, Project: Lagrange equations of the second kind. The equations of motion of mechanical systems, analysis of the mechanism with using Matlab and Adams softwares</td></tr>
<tr><td>Teaching methods</td><td colspan="9">Lectures: blackboard lectures, multimedia presentations and showing some examples, discussions
Project: work in groups, discussion, homework assignments
Self- study under supervision: tutorial sessions with worked examples, discussion, problem solving, homework assignments.</td></tr>
<tr><td>Assessment method</td><td colspan="9">Test/ Evaluation 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 recognize type of systems: holomonic and nonholomonic</td><td colspan="2">K_W07</td></tr>
<tr><td>LO2</td><td colspan="7">Student knows how find inertial forces and reactions in kinematics pairs</td><td colspan="2">K_W07</td></tr>
<tr><td>LO3</td><td colspan="7">Student understands the structure of the dynamic equation of motion</td><td colspan="2">K_W07</td></tr>
<tr><td>LO4</td><td colspan="7">Student uses Lagrangian method for deriving the equation of motion</td><td colspan="2">K_W01, K_U05</td></tr>
<tr><td>LO5</td><td colspan="7">Student is able to work in a team</td><td colspan="2">K_K03 K_K04</td></tr>
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LO6		
Symbol of learning outcome	**Methods of assessing the learning outcomes**	**Type of tuition during which the outcome is assessed**
LO1	Test	**L**
LO2	Test	**L**
LO3	Test and evaluation report	**L/P**
LO4	Test and evaluation report	**L/P**
LO5	evaluation report	**P**
LO6		
Student workload (in hours)		**No. of hours**
Calculation	Lecture attendance	30
	Participation in classes, laboratory classes	15
	Preparation for classes, laboratory classes, projects	13
	Participation in the student-teacher sessions related to classes/project	3
	Implementation of project task	4
	Working on projects, reports	6
	Preparation for and participation in the exams/test	10
	TOTAL:	**81**

Quantitative indicators	**HOURS**	**No. of ECTS credits**
Student workload – activities that require direct teacher participation	**48**	**1,5**
Student workload – practical activities	**39**	**1,5**

Basic references	1. John J. Uicker, Jr., Gordon R. Pennock and Joseph E. Shigly, “Theory of Machines and Mechanisms”, Oxford University Press, Third Edition, 2008. 2. J.Angeles, A. Kecskementhy, Kinematics and Dynamics of Mulit-body Systems, Springer Publisher, 1995 3. Hamilton H. Mabie, Charles F. Reinholtz, “Mechanisms and Dynamics of Machinery”, John-Wiley and Sons, Inc., New York, Fourth Edition, 1987. 4. R. L. Norton, "Design of Machinery: An Introduction to the Synthesis and Analysis of Mechanisms and Machines”, McGraw-Hill, Fifth Edition, 2011. 5. T. Bevan, "Theory of Machines", Published by Pearson Education, Third Edition, 2009.
Supplementary references	1. J.J.Craig, "Introduction to robotics: mechanics and control", Addison-Wesley, Third Edition, 2003.
Organisational unit conducting the course	**Department of Mechatronic Systems and Robotics** — **Date of issuing the programme**
Author of the programme	**Andrzej Koszewnik, D.Sc** — **19.03.2021**

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