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 colspan="2">Degree level and programme type</td><td>Bachelor's degree</td></tr>
<tr><td>Specialization/ diploma path</td><td colspan="6"></td><td colspan="2">Study profile</td><td></td></tr>
<tr><td rowspan="2">Course name</td><td colspan="6" rowspan="2">Mathematics II</td><td colspan="2">Course code</td><td>IS-MER0010S</td></tr>
<tr><td colspan="2">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>45</td><td>45</td><td></td><td>15</td><td></td><td></td><td></td><td>No. of ECTS credits</td><td>8</td></tr>
<tr><td>Entry requirements</td><td colspan="9">Mathematics I</td></tr>
<tr><td>Course objectives</td><td colspan="9">Ability of solving differential equations, using Laplace transform in engineering problems. Understanding of differential calculus of multivariable functions and ability of using them to finding extremas of multivariable functions. Ability of using mathematical statistics for analysis of real data</td></tr>
<tr><td>Course content</td><td colspan="9">Lecture and classes: Multivariable functions. Differential calculus of multivariable functions. Partial derivatives and their applications. Taylor series of function of two variables. Multiply integrals. Differential equations of the first order. Differential equations of n-th order. Laplace transform. Application of Laplace transform to differential equations. Probability. Bayes Theorem. Estimation. Statistical tests. Project: Numerical methods of Gauss elimination, solving nonlinear equations, diffeential equation. Application of computer packages to mathematical statistics.</td></tr>
<tr><td>Teaching methods</td><td colspan="9">Lecture, classes</td></tr>
<tr><td>Assessment method</td><td colspan="9"></td></tr>
<tr><td>Symbol of learning outcome</td><td colspan="8">Learning outcomes</td><td>Reference to the learning outcomes for the field of study</td></tr>
<tr><td>LO1</td><td colspan="8">Student has basic knowledge in differential equations of the I-st order and linear equations of n-th order and can solve them using classical methods and using Laplace transform</td><td></td></tr>
<tr><td>LO2</td><td colspan="8">Student has basic knowledge in derivation and integration of a multivariable function and can apply them to finding of extremas</td><td></td></tr>
<tr><td>LO3</td><td colspan="8">Student has a knowledge from fundamentals of probability and</td><td></td></tr>
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	mathematical statistics, in particular he/she can estimate and test an expected value and variation of a random variable.	
LO4	Student can use computer packages to solving simple numerical and statistical problems.	
LO5	Student can find needed information in literature and other sources.	
Symbol of learning outcome	**Methods of assessing the learning outcomes**	**Type of tuition during which the outcome is assessed**
LO1	test, writing exam	L,C
LO2	test, writing exam	L,C
LO3	test, writing exam	L,C
LO4	test, writing exam	L,C,P
LO5	test, writing exam	L,C,P
Student workload (in hours)		**No. of hours**
Calculation	lecture attendance	**45**
	participation in classes, projects	**60**
	preparation for classes, projects	**50**
	working on projects, reports, etc.	**20**
	participation in student-teacher sessions related to the classes/seminar/project	**5**
	preparation for and participation in exams/tests	**36**
	TOTAL:	**216**
Quantitative indicators	**HOURS**	**No. of ECTS credits**
Student workload – activities that require direct teacher participation	**116**	**4,5**
Student workload – practical activities	**160**	**6**
Basic references	1. J.Stewart, Calculus, 2011, 2. D.A. McQuarrie, Mathematical Methods for Scientists and Engineers, University Science Books, 2003, 3. E.W.Swokowski, Calculus with analytic geomety,	
Supplementary references	1. D.G.Zill, Differential Equations, Thomson, 2005	
Organisational unit conducting the course	Department of Robotics and Mechatronics	**Date of issuing the programme**
Author of the programme	Ewa Pawłuszewicz, DSc, Assoc. Prof.	**29.03.2021**

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