COURSE DESCRIPTION CARD

<table>
<tr><td colspan="11">Faculty of Electrical Engineering</td></tr>
<tr><td>Field of study</td><td colspan="7">Electrical and Electronic Engineering</td><td>Degree level and programme type</td><td>Bachelor's degree</td></tr>
<tr><td>Specialization/ diploma path</td><td colspan="7">-</td><td>Study profile</td><td>-</td></tr>
<tr><td rowspan="2">Course name</td><td colspan="7" rowspan="2">Fundamentals of Electrical Problem Oriented Programming</td><td>Course code</td><td>IS-FEE-10071S</td></tr>
<tr><td>Course type</td><td>elective</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></td><td>30</td><td></td><td></td><td>No. of ECTS credits</td><td>3</td></tr>
<tr><td>Entry requirements</td><td colspan="10"></td></tr>
<tr><td>Course objectives</td><td colspan="10">To introduce students to the basics of algorithms, Matlab program and programming in C language. To receive the abilities to design the algorithm and use special software for the analysis of electrical circuits. Developing the skills of computer algorithms designing and implementing them in the form of Matlab program and program in C language. Teaching students how to design and solve a problem of electrical circuits using Matlab program and Microsoft Visual C++ or Dev C++.</td></tr>
<tr><td>Course content</td><td colspan="10">Algorithm description methods. Block diagrams. Application of Matlab program to solve simple problems related to electrical engineering. Introduction to Matlab program (general structure of the program, arithmetic operations on real and complex numbers, operations on arrays and matrices, writing functions and scripts, execution and formatting of function graphs). Application programming in C language to solve simple problems related to electrical engineering. Introduction to: the structure of the program using C programming, terminology, data types, mathematical operations on variables, arrays, creating functions, using argument to functions..</td></tr>
<tr><td>Teaching methods</td><td colspan="10">specialization workshop</td></tr>
<tr><td>Assessment method</td><td colspan="10">two practical tests, evaluation of computer programs
verification of preparation for classes, project completion, discussion</td></tr>
<tr><td>Symbol of learning outcome</td><td colspan="8">Learning outcomes
Student who pass this course</td><td colspan="2">Reference to the learning outcomes for the field of study</td></tr>
<tr><td>LO1</td><td colspan="8">uses basic Matlab operations</td><td colspan="2"></td></tr>
<tr><td>LO2</td><td colspan="8">uses basic operation in C language</td><td colspan="2"></td></tr>
<tr><td>LO3</td><td colspan="8">creates and writes scripts and functions in Matlab program solve the electrical engineering problems</td><td colspan="2"></td></tr>
<tr><td>LO4</td><td colspan="8">creates and writes computes program in C language solve the electrical engineering problems</td><td colspan="2"></td></tr>
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LO5			
Symbol of learning outcome	**Methods of assessing the learning outcomes**	**Type of tuition during which the outcome is assessed**	
LO1	tests		
LO2	tests		
LO3	evaluating the student's computer programs and project		
LO4	evaluating the student's computer programs and project		
LO5			
LO6			
Student workload (in hours)		**No. of hours**	
Calculation	attending the class sessions	**30**	
	preparation for workshop activities	**10**	
	working on homework	**20**	
	preparation for practical tests	**15**	
	participation in student-teacher sessions	**5**	
	TOTAL:	**80**	
Quantitative indicators		**HOURS**	**No. of ECTS credits**
Student workload – activities that require direct teacher participation		**35**	**1,5**
Student workload – practical activities		**80**	**3**
Basic references	1. Gilat A., Subramaniam V., Numerical methods for engineers and scientists: an introduction with applications using MATLAB, John Wiley & Sons, Hoboken, 2011. 2. Prata S., C Primer Plus (6th Edition) (Developer's Library). Addison-Wesley Professional, 2013. 3. Elsherbeni A.Z., Demir V., The finite-difference time-domain method for electromagnetics with MATLAB simulations, SciTech Publishing, Raleigh, 2009. Kochan S.G., Programming in C (4th Edition) (Developer's Library). Addison-Wesley Professional, 2014.		
Supplementary references	1. Mathews J.H., Fink K.D., Numerical methods using MATLAB, Pearson Education, 2004. Shaw Z.A., Learn C the Hard Way: Practical Exercises on the Computational Subjects You Keep Avoiding (Like C). Addison-Wesley Professional, 2015.		
Organisational unit conducting the course	**Department of Electrotechnics, Power Electronics and Power Engineering**	**Date of issuing the programme**	
Author of the programme	**Agnieszka Choroszucho, Ph.D. Eng.**	**27.02.2020**	

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