

FACULTY OF ELECTRICAL  
ENGINEERING**SUBJECT CARD**

Name in Polish: **Informatyka w elektrotechnice**  
 Name in English: **Informatics in electrical engineering.**  
 Main field of study (if applicable): **Electrical Engineering**  
 Specialization (if applicable):  
 Level and form of studies: **1st level, full-time**  
 Kind of subject: **obligatory**  
 Subject code: **ELR052505**  
 Group of courses: **NO**

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU):	15			15	
Number of hours of total student workload (CNPS):	30			30	
Form of crediting:	crediting with grade			crediting with grade	
For group of courses mark (X) final course:					
Number of ECTS points:	1			1	
including number of ECTS points for practical (P) classes :				1	
including number of ECTS points for direct teacher-student contact (BK) classes:	0.70			0.70	

**PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES**

1. Student has the basic knowledge of programming in C language.
2. Student has the basic knowledge of the electric circuit theory.
3. Student is capable of creating the algorithm and program in C language.
4. Student is capable of formulating the mathematical form of electric circuit task.
5. Student can think creatively.
6. Student can work in a team.

**SUBJECT OBJECTIVES**

- C1. To assimilate knowledge to create programs in Matlab to analyze the steady and transient states of electric circuits.  
 C2. To become skillful at the creation of the function reading and writing the external files.  
 C3. To be able to present the computation results as graphics.

**SUBJECT LEARNING OUTCOMES***relating to knowledge:*

- PEU\_W01 Student has the basic knowledge concerning the matrix and array operations.  
 PEU\_W02 Student has the knowledge to write scripts and functions in Matlab using the external file of external input data or results.  
 PEU\_W03 Student has the knowledge concerning the graphical presentation of the results of electric circuit solutions.

*relating to skills:*

- PEU\_U01 Student can use the matrix and array operations to solve electric circuits.  
 PEU\_U02 Student can write the Matlab program containing the functions of reading input data and writing computation results.

*relating to social competences:*

- PEU\_K01 Student can cooperate in a team while creating the program in

## PROGRAMME CONTENT

Form of classes - lecture		Number of hours:
Lec 1	Using Matlab for engineering computation - basic matrix and array operations.	2
Lec 2	Instructions in Matlab: if, switch, for, while. Export and import of data from disc to memory. Rules to create scripts and functions in Matlab.	2
Lec 3	Graphics in Matlab - the application of object programming.	2
Lec 4	Graphical user interface - applications in electrical engineering.	2
Lec 5	Cooperation with external files - input and output functions. Using Matlab for solving the set of non-linear equations and optimizing the goal function.	2
Lec 6	The application of Matlab library functions to solve differential equations describing the transient states in electric circuit.	2
Lec 7	The rules of creating the function for statistical and graphical analysis of electric measurements.	2
Lec 8	Final test.	1
Total hours:		<b>15</b>

Form of classes - project		Number of hours:
Proj 1	The selection of the project topic. The topic project consists in creating the program of the analysis of steady and transient electric circuit states.	1
Proj 2	Drawing up the solution algorithm of the selected topic.	2
Proj 3	Working out the function which reads equivalent parameters from external files.	2
Proj 4	Selecting the library function which is needed to solve the electrical task.	2
Proj 5	The transformation the electric model to the general mathematical model used in Matlab.	2
Proj 6	Working out the group of functions which solve the selected electric circuit	2
Proj 7	Working out the function which writes the computation results in an external editorial text file on disc.	2
Proj 8	Working out the function which generates the graph of transient processes in the electric circuit.	2
Total hours:		<b>15</b>

## TEACHING TOOLS USED

- N1. Information lecture and multimedia presentation.
- N2. Project: presentation and topic selection, consultations, the verification of the correctness of functions created by the student.

## EVALUATION OF SUBJECT LEARNING OUTCOMES ACHIEVEMENT

Evaluation <i>F - forming (during semester) P - concluding (at semester end)</i>	Educational effect number	Way of evaluating educational effect achievement
F1(W)	PEU_W01 PEU_W02 PEU_W03	Final test
P(W)	P=F1	
F1(P)	PEU_U01 PEU_U02	Mark in the preparation of the plan of algorithms and solutions.
F2(P)	PEU_U01 PEU_U02	Mark in the selection of the solution method from the Matlab library.
F3(P)	PEU_U01 PEU_U02	Mark in the correctness of individual functions.
F4(P)	PEU_U01 PEU_U02 PEU_K01	Final grade of project
P(P)	$P=0.2F1+0.1F2+0.2F3+0.5F4$	

## PRIMARY AND SECONDARY LITERATURE

### PRIMARY LITERATURE:

- [1] Sobierajski M., Łabuzek M., Programming in Matlab. Oficyna Wydawnicza Politechniki Wrocławskiej, 2005. /in polish/  
 [2] Mrozek B., Mrozek Z., Matlab and Simulink. User handbook. 3rd edition Hellion 2010. /in polish/

### SECONDARY LITERATURE:

- [1] Lecture of Informatics in electrical engineering accessible at <http://eps.pwr.wroc.pl/studenci> /in polish/

<b>SUBJECT SUPERVISOR</b>
Marek Kott, marek.kott@pwr.edu.pl