

DESCRIPTION OF THE COURSES

- Course code: ELR2106
- Course title: DIGITAL MODELLING IN ELECTRICAL POWER ENGINEERING
- Language of the lecturer: polish

<i>Course form</i>	<i>Lecture</i>	<i>Classes</i>	<i>Laboratory</i>	<i>Project</i>	<i>Seminar</i>
<i>Number of hours/week*</i>	1			1	
<i>Number of hours/semester*</i>	15			15	
<i>Form of the course completion</i>	pass			pass	
<i>ECTS credits</i>	1			1	
Total Student's Workload	30			30	

- Level of the course (basic/advanced):): advanced
- Prerequisites:
completed course: Fundamentals of Circuit Theory, Informatics in Electrotechnics.
- Name, first name and degree of the lecturer/supervisor:
Eugeniusz Rosołowski, Prof., Ph. D., D. Sc.
- Names, first names and degrees of the team's members:
Jan Iżykowski, Ph. D., D. Sc.
Marek Michalik, Ph. D.
- Year: 5 Semester: 9
- Type of the course (obligatory/optional): obligatory
- Aims of the course (effects of the course):
The course provides descriptions of digital models used for solution of electromagnetic transients in complex three-phase electric networks.
- Form of the teaching (traditional/e-learning): traditional
- Course description:
The course consists of the lecture and projects. Both of these forms deal with the following problems: Modelling of multi-phase electrical network. Models of three-phase system elements: lines, transformers, generators and motors. Representation of control system blocks in network model. EMTP application to simulation of selected problems. EMTP-MATLAB interface.
- Lecture:

<i>Particular lectures contents</i>	<i>Number of hours</i>
1. <i>Introduction to modelling of multi-phase complex network.</i>	2
2. <i>Mathematical model of multiphase power line with distributed parameters. Taking into account the dependence of parameters on frequency.</i>	2
3. <i>Mathematical model of multi-phase and multi-winding transformer with non-linear magnetising branch.</i>	2
4. <i>Mathematical model of synchronous generator. Numerical representation of the generator model.</i>	2

5. <i>Modelling of static loads and motors.</i>	2
6. <i>Modelling of relays, relaying algorithms and instrument transformers.</i>	2
7. <i>Modelling of power electronic devices.</i>	2
8. <i>Pass test.</i>	1

- Classes – the contents:
- Seminars – the contents:
- Laboratory – the contents:
- Project – the contents:
Students work on individual projects related to the problems presented during the lecture.
- Basic literature:
 - [1] Dommel H.W.: Electromagnetic Transients Program. Reference Manual. BPA, Portland, 1986.
 - [2] Alternative Transients Program. Rule Book. K.U. Leuven, EMTP Center, 1987.
 - [3] <http://www.rose.pwr.wroc.pl>
- Additional literature:
 - [1] Kacejko P., Machowski J., Zwarcia w systemach elektroenergetycznych, WNT Warszawa 2002.
 - [2] Bernas S., Ciok Z.: Modele matematyczne elementów systemu elektroenergetycznego. WNT, Warszawa, 1977.
 - [3] Ogrodzki J.: Komputerowa analiza układów elektronicznych. PWN, Warszawa, 1994.
- Conditions of the course acceptance/creditation:
test pass, project pass.

* - depending on a system of studies