DESCRIPTION OF THE COURSES

- Course code: ARR2307
- Course title: Methods of optimization in industrial power engineering
- Language of the lecturer: Polish

Course form	Lecture	Classes	Laboratory	Project	Seminar
Number of hours/week*	2	0	0	0	0
Number of hours/semester*	30	0	0	0	
Form of the course completion	test				
ECTS credits					
Total Student's Workload					

- Level of the course (basic/advanced): basic
- Prerequisites: Devices and Substations
- Name, first name and degree of the lecturer/supervisor:
  Kazimierz Herlender, dr inż.
- Names, first names and degrees of the team's members:
  Jan Bujko, dr hab. inż., prof. pwr
  Antoni Klajn, dr inż.
  Waldemar Dołęga, dr inż.
  Mirosław Kobusiński, mgr inż.
- Year:...2.....   Semester:.3.....................
- Type of the course (obligatory/optional): obligatory
- Aims of the course (effects of the course):
  Understanding of meaning search of optimization solutions in industrial power engineering, skills descriptions of design algorithms and skills utilization informatics in optimization of industrial power engineering processes.
- Form of the teaching (traditional/e-learning): traditional
- Course description:
  Basic definitions in methodology of design and design process, its structure and methods its rationalization. Kinds of strategies utilization in design process in power engineering. Analysis and synthesis of the design problem. Optimization and polioptymalization of the solutions in power engineering. The main methods of the polioptymalization. Unification of elements. Methods of description of uncertain data. Informatics in power engineering design. Organization of the information in CAD/CAE systems – data bases. Rules of production of the CAD/CAE software and experts systems.
- Lecture:

Particular lectures contents	Number of hours
1. Basic definitions in methodology of design.	2
2. General structure of the design process and methods its rationalization.	2
3. Characteristic of the design process – model examples.	2
4. Kinds of design strategies.	2

5. Structure of design process in power engineering.	*2*
6. Analysis and synthesis of the design problem.	*1*
7. Basic definitions concern optimization and polioptymalization.	*1*
8. The main methods of the polioptymalization.	*2*
9. Multicriterion optimization of the structures of industrial power network.	*2*
10. Unification of elements.	*2*
11. Utilization of fuzzy sets and fuzzy number in description of uncertain data.	*2*
12. Informatics in power engineering design.	*1*
13. Rules of production of the software.	*2*
14. Organization of the information in CAD/CAE systems – data bases.	*2*
15. CAD/CAE systems in power engineering.	*2*
16. Experts systems in power engineering.	*2*

- Classes – the contents: isn't concerned
- Seminars – the contents: isn't concerned
- Laboratory – the contents: isn't concerned
- Project – the contents: isn't concerned
- Basic literature:

    1. Stadnicki J., Teoria i praktyka rozwiązywania zadań optymalizacji, z przykładami zastosowań technicznych, WNT, Warszawa 2006

    2. Helt P., Parol M., Piotrowski P., Metody sztucznej inteligencji w elektro-energetyce, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2000,

- Additional literature:

    1. Prognozowanie w elektroenergetyce. Zagadnienia wybrane, pod red. Ireny Dobrzańskiej, Wydawnictwo Politechniki Częstochowskiej, Częstochowa 2002

    2. Markiewicz H.: Urządzenia elektroenergetyczne, WNT, Warszawa, 2005

- Conditions of the course acceptance/credition: completion of the test

* - depending on a system of studies