

DESCRIPTION OF THE COURSES

- Course code: ELR 2303
- Course title: Power electronic I
- 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>	2				
<i>Number of hours/semester*</i>	30				
<i>Form of the course completion</i>	Pass				
<i>ECTS credits</i>	2				
<i>Total Student's Workload</i>	60				

- Level of the course (basic/advanced): basic
- Prerequisites: Basic electronic and electrical engineering
- Name, first name and degree of the lecturer/supervisor: Stanisław Szkółka; Ph.D
- Names, first names and degrees of the team's members: Józef Borecki, Ph.D; Waldemar Dołęga, Ph.D.; Antoni Klajn, Ph.D.
- Year:.....III..... Semester:.....5.....
- Type of the course (obligatory/optional): obligatory
- Aims of the course (effects of the course):
- Form of the teaching (traditional/e-learning): traditional
- Course description:

Power semiconductor devices. Naturally commutating converters: uncontrolled and controlled rectifier under R, RL load. Inversion. Single- and three-phase A.C. regulators. Cycloconverter. D.C switching regulators. Static power inverters. PWM inverters (pulse-width modulation). Influence of line-commutated converters on a power network. Selected applications of converters in industry.

- Lecture:

<i>Particular lectures contents</i>	<i>Number of hours</i>
1. Switching behaviour of diodes, thyristors and power transistors.	2
2. Characteristics and ratings of diodes, thyristors and transistors.	2
3. Protection system for power semiconductors	1
4. The single-phase half-wave uncontrolled and controlled rectifier under R, RL load.	2
5. 2- and 3-pulse uncontrolled and controlled rectifiers	2
6. 6- pulse controlled bridge rectifiers	2
7. Transformers for line commutated static converters	1
8. Cycloconverters	2
9. Multiplex bridge rectifiers	1
8. Single-phase A.C. regulators.	1
9. Three-phase A.C. regulators	1
10. Inversion of controlled rectifier	2

11. DC/DC step down and up regulators.	2
12. PWM inverters	2
13. Selected problems of industry applications of converters.	1
14. Influence of line-commutated converters on a power network	2
15. Converters of decrease influence on a power network	2
16. Pass	2

- Classes – the contents:
- Seminars – the contents:
- Laboratory – the contents:
- Project – the contents:
- Basic literature:

1. A. M. TRZYNADLOWSKI, INTRODUCTION TO MODERN POWER ELECTRONICS; 1998
2. DANIEL W. HART, INTRODUCTION TO POWER ELECTRONICS; 1997
3. THOMAS H. BARTON, RECTIFIERS, CYCLOCONVERTERS, AND AC CONTROLLERS; 1994
4. B.M.Bird & K.G.King Power electronics 1983.

- Additional literature:

1. B. JAYANT BALIGA, POWER SEMICONDUCTOR DEVICES; 1996
2. LASZLO TIHANYI, ELECTROMAGNETIC COMPATIBILITY IN POWER ELECTRONICS, 1995

- Conditions of the course acceptance/creditation:

Passing grades of quizzes.

* - depending on a system of studies