STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Fundamentals of electronics		**1010334131010335180**

Field of study	Profile of study (general academic, practical)	Year /Semester
Control Engineering and Robotics	**(brak)**	**2 / 3**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
-	**polish**	**obligatory**

Cycle of study:	Form of study (full-time,part-time)
First-cycle studies	**part-time**

No. of hours					No. of credits
Lecture: **24**	Classes: **-**	Laboratory: **24**	Project/seminars: **-**		**7**

Status of the course in the study program (Basic, major, other)	(university-wide, from another field)
(brak)	**(brak)**

Education areas and fields of science and art	ECTS distribution (number and %)
technical sciences	**7 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	K_W02: K_W08:
2	**Skills**	K_U01: K_U04:
3	**Social competencies**	K_K_02:

Assumptions and objectives of the course:

Knowledge concerning principles of operation of power electronics converters, rectifiers, AC/AC converters, AC/DC converters and inverters.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. K_W12 - [K_W12]
2. K_W19 - [K_W19]

Skills:

1. K_U06 - [K_U06]
2. K_U20 - [K_U20]
3. K_U23 - [K_U23]

Social competencies:

1. K_K04 - [K_K04]

Assessment methods of study outcomes

- Written and (optionally) oral examination,
- Laboratory: attendance in exercises, evaluation of written reports on laboratory exercises.

Course description

- Lectures: Introduction to power electronics. Overview of power semiconductor switches. Line-frequency phase commutated converters: analysis, simplified energy and signal models. Switch-mode converters: analysis , averaged models. DC/DC converters, inverters. Resonant converters. Power supply applications. Electric utility applications. Current harmonics. Developmental prospects of power electronics: new types of devices, "intelligent" modules.

- Laboratory: thyristor phase controlled rectifiers , switch-mode DC/DC converters , inverters.

Basic bibliography:

1. Lecture materials provided by the teacher in electronic form.

2. Wprowadzenie do elektroniki i energoelektroniki, Marian P. Kaźmierkowski, Jerzy T. Matysik, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 2005

3. Energoelektronika, część I - Półprzewodnikowe przyrządy i moduły energoelektroniczne, Leszek Frąckowiak, Stefan Januszewski , Wyd. Politechniki Poznańskiej, Poznań, 2003

Additional bibliography:

1. Power Electronics: Converters, Applications and Design, Ned Mohan, Tore M. Undeland, Wiliam P. Robins, Wiley, 2003

Result of average student's workload

Activity	Time (working hours)
1. Lectures	30
2. Laboratory excersises	20
3. Consultations	10
4. Preparation to laboratory excersises	40
5. Elaboration of	20
6. Preparation to examination	53
7. Attendance in examination	2

Student's workload

Source of workload	hours	ECTS
Total workload	175	7
Contact hours	62	2
Practical activities	42	2