STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Electronics		**1010331131010330033**

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	**full-time**

No. of hours					No. of credits
Lecture: **2**	Classes: **-**	Laboratory: **2**	Project/seminars: **-**		**5**

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	**5 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

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

Assumptions and objectives of the course:

Knowledge concerning principles of operation of the electronic circuits;
the ability of analysis as well as designing the electronic circuits.

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

Knowledge:

1. K_W_12 - [K_W12]

Skills:

1. K_U15 - [K_U15]
2. K_U20 - [K_U20]
3. K_U23 - [K_U23]

Social competencies:

1. K_K04 - [K_K04]

Assessment methods of study outcomes

- Lectures: written test , examination in semester 4
- Laboratory: attendance in exercises, evaluation of written reports on laboratory exercises.

Course description

- Lectures: Passive electronic components. Semiconductor materials ; p-n junction. Diodes , its models and applications; Bipolar transistors, field effect transistors. Integrated circuits of small and medium scale of integration. Operational amplifiers.

Applications of operational amplifiers to analogue signal processing. Analogue controllers and filters. Electronic switches, S&H, DA and AD converters; switched capacitors devices. Selected problems of industrial electronics.

Laboratory: diodes, transistors, operational amplifiers, filters; circuit-oriented simulation programs.

Basic bibliography:

1. Lecture materials provided by the teacher in electronic form
2. Elektronika. Układy elektroniczne, Waldemar Nawrocki, WPP, Poznań 2010
3. Wprowadzenie do elektroniki i energoelektroniki, Marian P. Kaźmierkowski, Jerzy T. Matysik, Oficyna Wyd. Pol. Warszawskiej, Warszawa, 2005

Additional bibliography:

1. Układy półprzewodnikowe, Ulrich Tietze, Christoph Schenk, WNT, Warszawa, 1996,2009
2. Elementy i układy elektroniczne w pytaniach i odpowiedziach, Mirosław Rusek, Jerzy Pasierbiński, WNT, Warszawa, 2006

Result of average student's workload

Activity	Time (working hours)
1. Lectures	30
2. Laboratory excersises	30
3. Preparation to laboratory excersises, elaboration of reports	30
4. Home excersises	15
5. Preparation to test	15
6. Attendance in consultations	5

Student's workload

Source of workload	hours	ECTS
Total workload	125	5
Contact hours	65	3
Practical activities	60	2