STUDY MODULE DESCRIPTION FORM

Name of the module/subject	Code
Electronics and Power Electronics	**1010321331010323752**

Field of study	Profile of study (general academic, practical)	Year /Semester
Electrical Engineering	**(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: **30** Classes: **-** Laboratory: **-** Project/seminars: **-**	**2**

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	**2 100%**
Technical sciences	**2 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic knowledge of physics, electrical engineering and mathematical analysis
2	**Skills**	Analysis and synthesis of electrical circuits, carrying out activities in the primary account of operator. The ability to effectively self-education in a field related to the chosen field of study.
3	**Social competencies**	It is aware of the need to broaden their skills and demonstrate their willingness to cooperate within the team

Assumptions and objectives of the course:

Getting to Know the construction, parameters and applications of basic electronic components. Getting to know the principles of operation of analog and digital electronic circuits. The acquisition of electronic design skills at a basic level.

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

Knowledge:

1. Can describe the operating principle and the basic parameters of electronic components, characterize the structure and use of basic analog and digital electronic circuits - [K_W04 + K_W07 + K_W14 +++]
2. He can describe the basic criteria for the design of electronic circuits - [K_W04 + K_W14 +++]

Skills:

1. He can apply his knowledge of electronics to analyze the operation of basic analog and digital electronic circuits - [K_U01 + K_U03 ++]

Social competencies:

1. He can think and act in an entrepreneurial manner in the area of electronic design - [K_K02 ++]

Assessment methods of study outcomes

Assessment of the knowledge and skills shown on the written examination of a test and problematic

Course description

The properties and characteristics of the basic elements and electronic devices: passive components, p-n junction, diodes, transistors and their operation and application. Semiconductor optoelectronic devices - properties and application examples. Power rectifiers. Feedback in analog circuits. Operational amplifiers: ideal, real, properties, performance, and applications. Power amplifiers: classification, properties, and applications. Signal generators: generation conditions, types, and application of generators. Analog Filters: types, designing and aplication. Basics of digital technology: the binary system of writing numbers, logic states and logical operations: introduction (elements of logic, logic, truth table), digital circuits and sequential combination. The use of digital circuits. The TTL family. Semiconductor memory - general classification and properties of some types of memory.

Basic bibliography:

1. W. Golde, Układy elektroniczne, Wydanie drugie, WNT, Warszawa, 1974
2. Z. Kulka Z., M. Nadachowski, Analogowe układy scalone, WKŁ, W-wa 1980
3. Z. Kulka Z., M. Nadachowski, Wzmacniacze operacyjne i ich zastosowania cz.1 i 2, WNT, W-wa 1982
4. P. Horowitz, W. Hill, Sztuka elektroniki, t. I, II, WKŁ, 1997
5. J. Kalisz, Podstawy techniki cyfrowej, WKiŁ, Warszawa 1998
6. P. Górecki, Wzmacniacze operacyjne, BTC, Warszawa 2002

Additional bibliography:

1. U. Tietze, Ch. Schenk, Układy półprzewodnikowe, WNT, 1996
2. M. P. Kaźmierkowski, J. T. Matysik, Wprowadzenie do elektroniki i energoelektroniki, OficynaWyd. PW, Warszawa 2005

Result of average student's workload

Activity	Time (working hours)
1. Udział w zajęciach wykładowych	30
2. Udział w konsultacjach	5
3. Przygotowanie do egzaminu	10

Student's workload

Source of workload	hours	ECTS
Total workload	45	2
Contact hours	35	1
Practical activities	0	0