STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Electronics and Power Electronics**		Code **1010321231010323752**
Field of study **Electrical Engineering**	Profile of study (general academic, practical) **(brak)**	Year /Semester **2 / 3**
Elective path/specialty **-**	Subject offered in: **polish**	Course (compulsory, elective) **obligatory**

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

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

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

Education areas and fields of science and art
 	
technical sciences
     Technical sciences
	ECTS distribution (number and %**)**
	
	2 100%
	     2 100%

Responsible for subject / lecturer:

Michał Gwóźdź
email: michal.gwozdz@put.poznan.pl
tel. 61 665 2646
Elektryczny
ul. Piotrowo 3A, 60-965 Poznań

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 operate in the primary account of operator. Ability to effectively self-education in a field related to the chosen field of study
3	**Social competencies**	Is aware of the need to broaden their competence, willingness to work together as a team

Assumptions and objectives of the course:

Getting to know the structure, characteristics and applications of basic electronic components. Getting to know the principles of analog and digital electronic circuits. Purchase of electronic design skills at a basic level.

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

Knowledge:

1. It is able to describe the principles of operation and characteristics of basic electronic components, characterize the structure and application of basic analog and digital electronic circuits - [K_W04 +, K_W07 +, K_W14 +++]

2. It is able to describe the basic criteria for the design of electronic circuits - [K_W04 +, K_W14 +++]

Skills:

1. Can use knowledge of the electronics for the analysis of basic analog and digital electronic circuits - [K_U01 +, K_U03 ++]

2. It can specify the criteria necessary for the proper design of the electronic system at primary level - [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

lecture

- Assess the knowledge and skills listed on the written exam with a test and problematic,

Laboratory:

- Test and favoring knowledge necessary to realize the set of problems in the area of tasks in the laboratory,

- Continuous evaluation, rewarding gain skills they met the principles and methods

- Assessment of knowledge and skills related to the implementation of laboratory exercises, the evaluation report made ??exercise.

Get extra points for the activity in the classroom, and in particular for:

- Propose to discuss further aspects of the subject;

- The effectiveness of the application of the knowledge gained during solving the given problem;

- Ability to work within a team practice performing the task detailed in the laboratory;

- Comments related to the improvement of teaching materials;

- Developed aesthetic diligence reports and jobs - in the self-study.

Course description

Properties and characteristics of the basic elements and electronic devices: passive components, pn junction, semiconductor diodes, bipolar transistors and field systems and their operation and use. Semiconductor optoelectronic devices - properties and application examples. Feedback in analog systems. Operational amplifiers - the ideal and the real, properties, performance and applications. Amplifiers - classification, properties, applications. Electronic Generators: generation vibration conditions, types and application generators. Analogue filters: linear systems, types, projects, and apply filters. Rectifier circuits and power. Introduction to Digital: write binary system of numbers, logic and logical operations - introduction (logic elements, logic, truth table, Karnaugh table), digital combinational and sequential circuits. Applications of digital circuits. TTL circuits. Semiconductor memory: the general classification, describes the basic properties of the selected types of memory. Introduction to microprocessor systems.

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. Participation in lecture classes	30
2. Participation in consultation	4
3. Exam Preparation	15
4. Participation in the exam	4

Student's workload

Source of workload	hours	ECTS
Total workload	53	2
Contact hours	38	2
Practical activities	0	0