STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Fundamentals of electronics**		Code **1010341741010325180**
Field of study **Mathematics in Technology**	Profile of study (general academic, practical) **general academic**	Year /Semester **2 / 4**
Elective path/specialty **-**	Subject offered in: **Polish**	Course (compulsory, elective) **obligatory**

Cycle of study: **First-cycle studies** **(Polish Qualifications Framework level six)**	Form of study (full-time,part-time) **full-time**

No. of hours				No. of credits **4**
Lecture: **30**	Classes: **-**	Laboratory: **30**	Project/seminars: **-**	

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

Education areas and fields of science and art	ECTS distribution (number and %)
Technical sciences	**4 100%**
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Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic knowledge of electrical engineering and mathematical analysis [K_W03 (P6S_WG)]
2	**Skills**	Using electrotechnical law to analyze DC and AC circuits [K_U10 (P6S_UW)]
3	**Social competencies**	It is aware of the need to expand his competencies and is ready to cooperate within the team [K_K02 (P6S_KK)]

Assumptions and objectives of the course:

Learning about the properties of basic elements and electronic circuits used in practice and the methodology of their analysis and experimental research

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

Knowledge:

1. well structured knowledge of the classification of basic electronic components and methods of processing electrical signals – [K_W04 (P6S_WG)]

2. Can explain the principles and techniques of acquisition and processing of measurement signals for industrial applications – [K_W08 (P6S_WG)]

Skills:

1. Can design and launch electronic systems for simple engineering applications - [K_U09 (P6S_UW)]

2. He can perform simple maintenance work in the area of electronic engineering - [K_U06 (P6S_UW)]; [K_U13 (P6S_UK)]

Social competencies:

1. Potrafi działać w sposób odpowiedzialny i przedsiębiorczy w obszarze inżynierii elektronicznej. – [K_K03 (P6S_KO)]

Assessment methods of study outcomes
-Lectures: -evaluation of the knowledge with a written exam related to the content of lectures (test, computational and problem questions), - rewarding presence and activity in lectures and marks obtained in laboratory exercises rcises   -Laboratory exercises: - continuous estimating with the tests, - the evaluation of knowledge and skills connected with the measuring tasks and marks of prepared reports
Course description
Updating 2018 Methods of education are orientated to students to motivate them to participate actively in education process by discussion and reports. Lectures: Multimedia presentations expanded by examples shown on a board. Activity of students is taken into consideration in final students evaluation. Theoretical questions are presented in the exact reference to the practice.   Laboratory: Detailed reviewing of particular exercises reports. Realization of laboratory tasks in teams.   Features of the basic semiconductor components: passive semiconductor components, semiconductor diodes, Zener diodes, bipolar transistors, optoelectronic components and their uses. Amplifiers of direct voltage and alternating voltage. The role of negative and positive feedback. Operational Amplifiers: properties, parameters and applications. Unstabilized and stabilized power supplies. Basics of signal filtering. The basics of digital technology - binary system, logic gates and logical operations. Boolean algebra laws. Integrated digital elements - technologies and major properties, combination and sequential systems. Semiconductor memories.

Basic bibliography:

1. A. Filipkowski, Układy elektroniczne analogowe i cyfrowe , WNT 1993

2. Z. Kulka , M. Nadachowski, Wzmacniacze operacyjne i ich zastosowania cz. 1 i 2 WNT 1983

3. U. Tietze, Ch. Schenk, Układy półprzewodnikowe, WNT, Warszawa 2007

4. J. Zakrzewski, Czujniki i przetworniki pomiarowe, Wyd. Politechniki Śląskiej, Gliwice 2004

Additional bibliography:

1. J. Jakubiec, J. Roj, Pomiarowe przetwarzanie próbkujące, wyd. Politechniki Śląskiej, Gliwice 2000

2. Denton J. Dailey, Electronic Devices and Circuits, copyright 2001 by Prentice-Hall, Inc., Upper Sadle River, New Jersey 07548, USA. Warszawa 2002.

Result of average student's workload	
Activity	**Time (working hours)**
1. Participation in lectures	30
2. Participation in laboratory exercises	30
3. Participation in consulting with the teachers	6
4. Preparation to laboratory exercises and preparation of the reports	20
5. Preparation to exam	14

Student's workload		
Source of workload	**hours**	**ECTS**
Total workload	100	4
Contact hours	66	2
Practical activities	50	2