

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Electronics and Electrical Engineering</b>		Code <b>1011105251011107818</b>
Field of study <b>Engineering Management - Part-time studies -</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>3 / 5</b>
Elective path/specialty <b>-</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>elective</b>
Cycle of study: <b>First-cycle studies</b>	Form of study (full-time, part-time) <b>part-time</b>	
No. of hours Lecture: <b>10</b> Classes: <b>-</b> Laboratory: <b>-</b> Project/seminars: <b>-</b>		No. of credits <b>2</b>
Status of the course in the study program (Basic, major, other) <b>(brak)</b>		(university-wide, from another field) <b>(brak)</b>
Education areas and fields of science and art		ECTS distribution (number and %)
<b>Responsible for subject / lecturer:</b> Wojciech Kowalczyk email: wojciech.kowalczyk@put.poznan.pl tel. 61 6652043 Wydział Informatyki 60-965 Poznań, ul. Piotrowo 3a		<b>Responsible for subject / lecturer:</b> Tomasz Jedwabny email: tomasz.jedwabny@put.poznan.pl tel. 61 6652757 Wydział Informatyki 60-965 Poznań, ul. Piotrowo 3a
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	One has basic knowledge about decimal and binary arithmetic, algebra (also Boole's algebra), geometry, differential/integral calculus, complex numbers and Laplace transformation. One has basic knowledge about electrical and electromagnetic phenomena in physics.
2	<b>Skills</b>	One has an ability to understand technical documentation of devices and their elements. One has an ability of individual and team work; knows how to work on the basis of time schedule and procedures. One is able to prepare documentation of realized tasks, prepare a report which presents results and conclusions. One knows how to solve a set of algebraic equations. One knows how to use Boole algebra.
3	<b>Social competencies</b>	One is aware of necessity to take care of one's own and co-workers' safety in contact with laboratory/technical/industrial environment. One is aware of social and economic consequences of improper, inconsistent with safety rules and unprofessional usage of equipment and technical systems which can generate threats for human life.
<b>Assumptions and objectives of the course:</b> Introduction of basics of electrical engineering and electronics from theoretical and practical point of view; obtaining skills of reading electrical data sheets, recognition of electrical components, building simple electrical and electronic sets; ability of algebraic solving of simple electrical sets.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. Studnet has a basic knowledge of: technology, electronics and electrical engineering - [K1A_W06]		
<b>Skills:</b>		
1. Student is able to independently develop a simple project in the area of the subject - [K1A_U05]		
2. Student can use known methods to formulate and solve given problem within the area of the subject - [K1A_U09]		
<b>Social competencies:</b>		
1. Student is aware of the need for lifelong learning and to inspire and organize the learning process of other - [K1A_K01]		
2. Student is willing to cooperate and work in teams to solve given tasks - [K1A_K03]		
<b>Assessment methods of study outcomes</b>		

<p>Formative assessment:  a) for the lecture: on the basis of answers to questions about the topics covered in previous lectures,  b) for the laboratory: based on an assessment of the progress of the laboratory tasks.  Recapitulative assessment:  a) for the lecture: on the basis of written work on the issues discussed during the lectures,  b) for the laboratory: on the basis of the assessment of performed laboratory tasks and their reports.</p>		
<b>Course description</b>		
<p>Electrical properties of materials: conductors, dielectrics, semiconductors, types of electrical charge carriers, basic electrical parameters (potential difference, voltage, current, power, energy, resistance, capacitance, inductance, impedance), and the units of these parameters, basic knowledge about construction and relevant properties of basic elements used in electrical engineering: resistors, coils, capacitors and physical phenomena which are basis for functioning of those elements, basic electrical engineering laws: Ohm laws, I and II Kirchhoff laws; properties of real voltage sources and ways of connecting several of those sources in order to obtain substitute sources with different parameters, influence of temperature on conductors and semiconductors and ways of using those influences in electrical/electronic devices, basic concept of electrical circuits: momentary value of voltage, current, power, dependence of those values, average and effective values of voltage and current, functioning of electrical transmitters, architecture of basic electrical machine, vector graphs which are used for description of elements and circuits for ac current, concept of real power, reactive and apparent power and knows dependence between those powers, functioning of RLC circuits, also about resonance phenomenon, semiconductors and also architecture and way of functioning of semiconductor elements: diode, transistor, thermistor, integrated circuits, photoelectrical and luminescent elements, the principle of operation of power supply circuits, especially those with one half and two half rectifiers, stabilizer with Zener diode, the principle of operation of transistor as amplifier, principle of operation of electrical logical gates and simple combination circuits and sequential elements, the role of digital elements in complex electrical circuits, principle of operation of 7 segment displays consisting of LED diodes and knows how to control them.</p> <p>Lecture - informative and conversational lecture  Laboratory - laboratory method</p>		
<b>Basic bibliography:</b>		
<ol style="list-style-type: none"> <li>1. Podstawy elektrotechniki i elektroniki, A. Kloskowski, J. Wawer, Ł. Marcinkowski, Wydawnictwo Politechniki Gdańskiej 2015</li> <li>2. Laboratorium elektrotechniki i elektroniki dla kierunku Inżynierii Bezpieczeństwa Pracy, red. E. Leśniewska, Wydawnictwo Politechniki Łódzkiej 2014</li> <li>3. Podstawy elektrotechniki i elektroniki dla nieelektryków, red. J. Smyczek, Wydawnictwo Uczelniane Politechniki Koszalińskiej, 2012</li> </ol>		
<b>Additional bibliography:</b>		
<ol style="list-style-type: none"> <li>1. Elektronika i elektrotechnika Kwartalnik Akademia Górniczo - Hutnicza im Staszica, Uczelniane Wydawnictwa Naukowo - Dydaktyczne 1999 -</li> </ol>		
<b>Result of average student's workload</b>		
<b>Activity</b>	<b>Time (working hours)</b>	
1. Lecture	10	
2. Consultations	10	
3. Preparation to exam	30	
4. final assessment	5	
<b>Student's workload</b>		
<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	55	2
Contact hours	25	1
Practical activities	5	0