STUDY MODULE DESCRIPTION FORM

Name of the module/subject	Code
Electronics and Electrical Engineering	**1011101241010537818**

Field of study	Profile of study (general academic, practical)	Year /Semester
Logistics - Full-time studies - First-cycle studies	**(brak)**	**2 / 4**

Elective path/specialty	Subject offered in:	Course (compulsory, elective)
-	**Polish**	**elective**

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

No. of hours	No. of credits
Lecture: **15**　　Classes: **-**　　Laboratory: **-**　　Project/seminars: **15**	**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　　　**Technical sciences**	**2　100%**　　　　**2　100%**

Responsible for subject / lecturer:	Responsible for subject / lecturer:
Wojciech Kowalczyk email: wojciech.kowalczyk@put.poznan.pl tel. 61 6652043 Wydział Informatyki 60-965 Poznań, ul. Piotrowo 3a	Tomasz Jedwabny email: tomasz.jedwabny@put.poznan.pl tel. 61 6652757 Wydział Informatyki 60-965 Poznań, ul. Piotrowo 3a

Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	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	**Skills**	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	**Social competencies**	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.

Assumptions and objectives of the course:

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.

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

Knowledge:

1. Studnet has a basic knowledge of: technology, electronics and electrical engineering - [K1A_W06]

Skills:

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]

Social competencies:

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]

Assessment methods of study outcomes

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.

Course description

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 there parameters, basic knowledge about construction and relevant properties of basic elements used in electrical engineering: resistors, coils, capacitors and 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 tchem.

Basic bibliography:

1. Praca zbiorowa Elektrotechnika i elektronika dla nieelektryków WNT 1995

2. Elektrotechnika ogólna, praca zbiorowa, Wyd. Politechniki Śląskiej, Gliwice, 1998

Additional bibliography:

Result of average student's workload

Activity	Time (working hours)
1. Lecture	15
2. Laboratory	15
3. Consultations	10
4. Preparation to laboratory	10

Student's workload

Source of workload	hours	ECTS
Total workload	60	2
Contact hours	45	1
Practical activities	15	1