# STUDY MODULE DESCRIPTION FORM

| Name of the module/subject | Code |
|---|---|
| **Electronics and Electrical Engineering** | **1011104341010537818** |

| Field of study | Profile of study (general academic, practical) | Year /Semester |
|---|---|---|
| **Logistics - Part-time studies - First-cycle** | **general academic** | **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** | **part-time** |

| No. of hours | No. of credits |
|---|---|
| Lecture: **8** Classes: **-** Laboratory: **-** Project/seminars: **8** | **2** |

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

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

**Responsible for subject / lecturer:**

Wojciech Kowalczyk
email: wojciech.kowalczyk@put.poznan.pl
tel. 61 6652043
Wydział Informatyki
60-965 Poznań, ul. Piotrowo 3a

**Responsible for subject / lecturer:**

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** | Has basic knowledge of decimal and binary arithmetic, algebra (including Boolean algebra), geometry, differential and integral calculus, complex numbers.<br>Has basic knowledge in the field of physics including electrical phenomena. |
| 2 | **Skills** | Has the ability to understand technical documentation of devices and their components.<br>Has the ability of individual and team work; can implement properly according to the assumed schedule / study.<br>Is able to develop documentation on the task, prepare a text containing a discussion of results and conclusions.<br>Has the ability to solve systems of algebraic equations.<br>Has the ability to use Boolean algebra. |
| 3 | **Social competencies** | Is aware of the need to care for your safety and your colleagues in contact with the laboratory / technical / industrial work environment.<br>He is aware of the social and economic consequences of an inappropriate, unprofessional use of devices and technical systems that could pose a threat to human life. |

## Assumptions and objectives of the course:

Acquainting with the basics of electrotechnics and electronics, both theoretical and practical. Acquiring the ability to read electrical diagrams, recognize elements, build simple electrical and electronic systems. Ability to algebraically solve simple electrical systems.

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

### Knowledge:

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

### Skills:

1. The student can independently develop a simple problem within electronics and electrical engineering - [K1A_U05]
2. He can use the methods he has learned to formulate and solve a project task within electronics and electrical engineering - [K1A_U09]

### Social competencies:

1. The student is aware of the need to learn throughout life and to inspire and organize the learning process of others - [K1A_K01]
2. He is willing to cooperate and work in a group in order to solve set tasks - [K1A_K03]

## Assessment methods of study outcomes

Forming rating:

a) in terms of the lecture: based on the answers to questions about the material discussed in previous lectures,

b) in the scope of the laboratory: based on the assessment of the current progress of laboratory tasks.

- Summary rating:

a) in the scope of the lecture: on the basis of a test of theoretical knowledge from the lecture material,

b) in the scope of the laboratory: based on the assessment of completed laboratory tasks and prepared reports.

Summary rating:

a) in the field of laboratories based on the results of the average partial grades of the formulating assessment

b) in the field of lectures: pass on the basis of a written knowledge check in the form of a test. You can take the test after passing the laboratories

## Course description

Electrical properties of various materials: conductors, dielectrics, semiconductors; types of electric charge carriers; basic electrical quantities (potential difference, voltage, current, power, energy, resistance, electrical capacity, inductance, impedance) and units used to express their size; construction and essential properties of basic elements used in electrotechnics: resistors, coils, capacitors and physical phenomena on which the functioning of these elements is based; basic laws of electrical engineering: Ohm's law, I and II Kirchhoff's law; properties of the actual voltage source and methods of combining many such sources in order to obtain a substitute source with different parameters; influence of temperature on conductors and semiconductors and ways of using this property in electrical / electronic devices; basic concepts related to alternating circuits: instantaneous values ??of voltage, current, power, relationships of these quantities; average and effective values ??of voltage and current; principle of operation of electrical relays; vector charts used to describe AC ??elements and circuits; active, reactive and apparent power as well as relations between them; RLC circuits, resonance phenomenon; semiconductors, structure and principle of operation of semiconductor devices: diodes, transistors, thermistors, integrated circuits, photoelectric and luminescent elements; power supply systems, including one- and two-split rectifiers, stabilizers with Zener diode; transistor as an amplifier; logic gates and simple combinational circuits; selected sequential elements; functions of digital elements in complex electronic devices; seven-segment displays based on LEDs and how to control them.

Teaching methods:

Lecture - informative and conversational lecture

## Basic bibliography:

## Additional bibliography:

## Result of average student's workload

| Activity | Time (working hours) |
|---|---|
| 1. Lectures | 8 |
| 2. Project | 8 |
| 3. Consultation | 10 |
| 4. Literature studying | 15 |

## Student's workload

| Source of workload | hours | ECTS |
|---|---|---|
| Total workload | 41 | 2 |
| Contact hours | 26 | 1 |
| Practical activities | 8 | 1 |