



COURSE DESCRIPTION CARD - SYLLABUS

Course name

PO6: Electronics of electric vehicles in practice - Electronic circuits design

Course

Field of study

Electromobility

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

3/6

Profile of study

general academic

Course offered in

polish

Requirements

elective

Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

Michał Boltrukiewicz Ph.D. Eng.

email: michal.boltrukiewicz@put.poznan.pl

tel. 61 6652032

Faculty of Automatic, Robotics and Electrical Engineering

Piotrowo 3 Street, 60-965 Poznań

Responsible for the course/lecturer:

Grzegorz Wiczyński D.Sc. Eng.

email: grzegorz.wiczynski@put.poznan.pl

tel. 61 6652639

Faculty of Automatic, Robotics and Electrical Engineering

Piotrowo 3 Street, 60-965 Poznań

Prerequisites

Basic knowledge of electrical engineering and electronics. Basic knowledge of electronic analog and digital circuits. Knowledge in scope of construction of electric vehicles. Ability to effectively self-study in the field related to the design and construction of electronic circuits. Awareness of the need to expand their competences and is ready to cooperate as part of a team.

Course objective

Presentation of the basics of designing, manufacturing, commissioning and testing of general-purpose electronic circuits.



Course-related learning outcomes

Knowledge

1. Knows the structure and principles of operation of general-purpose analog and digital electronic and optoelectronic systems.
2. Understands the processes taking place in life cycle of simple electronic systems.

Skills

1. Can design general purpose simple electronic systems and devices for industrial applications.
2. Can create and run typical general purpose electronic circuits and devices.
3. Can test and diagnose simple general purpose electronic circuits and devices.

Social competences

1. Understands the importance of knowledge in solving problems in the field of general purpose electronics.
2. Is aware of the need to use the knowledge of experts when solving engineering tasks beyond their own competences.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lectures

Evaluation of the knowledge with a written test related to the content of lectures (test, computational and problem questions). Passing threshold of test equals 50%.

The grade from laboratory as well as attendance and activities during the lectures are taken into account.

Laboratory

Rewarding of knowledge necessary to implement the problems posed in the area of laboratory tasks. Current assessment of skill related with realised task. Evaluation of the as-built design. Assessment of knowledge demonstrated on the written test in the scope of laboratory content (test questions and calculating tasks).

Programme content

Lectures

The major general-purpose electronic systems. Requirements for electronic devices in industry applications. Systems with low energy consumption. Application and realisation of devices with galvanic separation. The standards of data transmission in industrial systems - RS232, RS-485, USB. Electronic circuits power supply - DC/DC and DC/AC converters. The interfaces of sensors and executive devices (controllers of DC and Stepper Motors). Selected industrial measuring devices. Connectors, wires,



housings, cooling, shielding of electronic circuits in industrial systems. Techniques of assembling electronic circuits and making of PCB.

Laboratory

Knowledge of the principle of safety during laboratory classes. Design and implementation of a simple general purpose electronic circuit . Diagnostics and testing of the completed electronic circuit. Preparation of as-built documentation for the completed circuit.

Teaching methods

Lecture

Lectures are performed using multimedia presentations illustrated with simulation examples and necessary mathematical calculations on the blackboard. Theoretical questions are presented in the exact reference to the practice.

Laboratory

Project development and making simple electronic circuit using method of soldering elements on printed circuit board (PCB). Individual use of laboratory equipment during diagnostics and testing of manufactured electronic circuits. Acquiring measurement results for as-built documentation.

Bibliography

Basic

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Additional

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Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	30	1,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) ¹	20	0,5

¹ delete or add other activities as appropriate