COURSE DESCRIPTION CARD - SYLLABUS

Course name
Electronics and optoelectronics [S1Elmob1>EiO2]

Course

Field of study
Electromobility

Year/Semester
2/4

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
0

Laboratory classes
30

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

Knowledge of the operation of analogue and digital electronic and optoelectronic systems. It knows and can explain the phenomena and properties of electronic and optoelectronic components. He recognizes basic electronic elements and, on basis of literature sources, can determine their parameters and application conditions. Able to design simple electronic and optoelectronic systems. Aware that for the proper design and maintenance of electronic and optoelectronic systems, it is necessary to understand how such systems work. It is aware of the importance of extending its competence and shows readiness to cooperate within a team.

Course objective

To understand the properties of basic components and operation of simple electronic and optoelectronic systems and their testing.

Course-related learning outcomes

Knowledge:
1. Knows the design and construction of simple analogue and digital electronic and optoelectronic systems.

2. Has practical knowledge of diagnostics and testing of simple electronic systems.

Skills:
1. Is able to plan and conduct tests on electronic and optoelectronic components and use the technical documentation attached to them.
2. Be able to test and diagnose simple electronic and optoelectronic systems from an electromobility range.
3. Is able to determine the operating conditions of simple electronic systems on basis of technical documentation.
4. Can build and document simple electronic systems used in electromobiles.
5. Be able to conduct tests on electronic and optoelectronic systems and present the results of the tests properly.

Social competences:
Aware that the rapidly developing science and technology forces the need to constantly improve knowledge of electronic and optoelectronic components and systems in electromobile applications.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Laboratory classes
The basic method of verifying knowledge achieved in the realization of laboratory exercises is the assessment of a report individually prepared by the student. Laboratory classes take place in cycles with a specific number of laboratory exercises, after which a test of evaluation of knowledge acquired by students is conducted. In addition, the entrance tests verify and reward the knowledge necessary for the realization of the problems posed in the area of laboratory tasks. The passing of laboratory classes is connected with the completion of all exercises, individual reports and positive evaluations from the entrance tests and tests.

Programme content

Laboratory classes
Laboratory classes are conducted in fifteen 90-minute meetings, in 4 subgroups. The subject of laboratory classes is divided into four parts.
a) Topics of the first part are: introduction, introduction to the measuring instruments and techniques used in the laboratory classes.
b) In the second part, laboratory tests shall be conducted on basic passive and active electronic components and systems, paying attention to their practical application.
c) More complex electronic and optoelectronic systems such as A/C and D/A converters, generators and sequential and combination digital systems shall be tested in the third part.
d) In the last cycle, optoelectronic components and systems such as fibre-optic cables, detectors and emitters of optical radiation will be tested.

Course topics

none

Teaching methods

Laboratory exercises are conducted in laboratory groups. During the classes, a connection of the measurement system is performed, the conduct of indicated measurements, preparation of measurement results and a report. In addition, an individual design and assembly of uncomplicated printed circuit boards is performed. The applied teaching methods are student-oriented and motivate students to actively participate in the teaching process through discussions and lectures.

Bibliography

Basic
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3. U. Tietze, Ch. Schenk, Układy półprzewodnikowe, WNT, Warszawa 2007
4. J. Zakrzewski, Czujniki i przetworniki pomiarowe, Wyd. Politechniki Śląskiej, Gliwice 2004
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Breakdown of average student's workload

	Hours	ECTS
Total workload	55	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	25	1,00