COURSE DESCRIPTION CARD - SYLLABUS

Course name
Basics of teletransmission [S1Elmob1>PT]

Course

Field of study
Electromobility

Year/Semester
3/5

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
15

Laboratory classes
15

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

A student starting this course should have basic knowledge of mathematics, computer science and communication interfaces, as well as the ability to work in a laboratory group.

Course objective

Expanding knowledge on the systems of the Internet of Things. Learning the basics of programming mobile devices. Understanding the classification and detailed requirements for Industry 4.0. Getting to know the basics of building base stations and measuring and measuring systems. Acquiring practical skills in designing and programming of things and mobile internet devices.

Course-related learning outcomes

Knowledge:
1. Has knowledge about the construction of transmission tracks in automotive systems.
2. Has knowledge of actuators and measuring devices.

3. Has knowledge of basic transmission protocols.
4. Has knowledge of diagnostics of transmission systems.

Skills:
1. Knows how to use appropriate methods and tools, including advanced information and communication techniques, to diagnose the selected system.
2. Knows how to carry out basic functional tests of a modern car installation.
3. Can perform simple simulations of the operation of selected systems.

Social competences:
1. He understands that the knowledge of teletransmission is essential in the work of an engineer.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture:
The knowledge acquired during the lecture is verified during the written exam during the exam session and the partial test on the Moodle platform. The exam consists of open questions, scored depending on the difficulty level. Points from the partial test are added to the points obtained in the exam. Passing threshold: 50% of the total number of points. Exam issues are sent to the head of the year by e-mail using the university e-mail system 2-3 weeks before the exam date and discussed during the last lecture.
Laboratory:
The skills acquired during the laboratory exercises are verified on the basis of reports made by students at home after the exercises. Exercises are held in 4 cycles. Each cycle ends with a final test which checks the knowledge of students acquired during the exercises. During the laboratory classes, verbal preparation of students for the exercise is verified. Passing the laboratory classes requires the completion of all exercises, individual completion of the reports indicated by the teacher and passing tests.

Programme content

Lecture:
Methods and elements communicating with each other in automotive systems. Selected transmission protocols (CAN, LIN). Diagnostic methods for CAN and LIN protocols. FlexRay interface. Introduction to Media Oriente System Transport. Bluetooth technology in automotive systems. Review of Smart Cities solutions.
Laboratory:
The issues covered are related to:
- basics of telecommunications in car systems
- LIN bus
- CAN bus
- FlexRay interface in version 2.1
- Media Oriente System Transport (MOST)
- the use of Bluetooth in automotive systems
- the idea of Smart Cities.

Teaching methods

Lecture: multimedia presentation (including: drawings, photos, animations, films) supplemented with examples given on the board, especially computational ones. Taking into account various aspects of the issues presented, including: economic, ecological, legal and social. Presenting a new topic preceded by a reminder of related content, known to students from other subjects,
Laboratory: performing laboratory exercises in teams (preparation of the stand, building measuring systems, performing experiments) with the help and supervision of the teacher.

Bibliography

Basic:
1. Multiplexed Networks for Embedded Systems, Dominique Paret, 2007.
2. Embedded Networking with CAN and CANopen, Andrew Ayre, Christian Keydel, Olaf Pfeiffer, 2003
3. CAN system engineering, Wolfhard Lawrenz, 1997

4. CANopen Implementation: Applications to Industrial Networks, Mohammad Farsi, Manuel Bernardo Martins Barbosa, 2000.
5. Vehicle data buses in workshop practice, Martin Frei, Wydawnictwa Komunikacji i Łączności WKŁ, 2016.

Additional:
1. Controller Area Network Projects, Dogan Ibrahim, 2011.
2. MOST: The Automotive Multimedia Network, Andreas Grzemba, 2008.
3. Digital distributed controller operating as part of the Internet of Things, Michał Krystkowiak, Mariusz Świderski, Poznan University of Technology Academic Journals, Electrical Engineering, 2016, Issue 88, pp. 165-174.

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