



COURSE DESCRIPTION CARD - SYLLABUS

Course name

AUTOSAR standard [S2Emob1-SPE>SA]

Course

Field of study

Electromobility

Year/Semester

1/2

Area of study (specialization)

Energy Processing Systems

Profile of study

general academic

Level of study

second-cycle

Course offered in

Polish

Form of study

full-time

Requirements

compulsory

Number of hours

Lecture

15

Laboratory classes

0

Other (e.g. online)

0

Tutorials

0

Projects/seminars

15

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

A student starting this subject should have basic knowledge of the basics of programming and mathematics and the construction of modern vehicles. He should also have the ability to obtain information from indicated sources and be ready to cooperate within a team.

Course objective

Providing students with basic knowledge about the AUTOSAR Standard. Familiarization with popular tools and components compatible with AUTOSAR.

Course-related learning outcomes

Knowledge:

1. Has extended knowledge in the field of programming techniques and the use of modern IT tools for the analysis and synthesis of electrical systems of hybrid and electric vehicles, including traction vehicles.

2. Has theoretically based knowledge of modern methods of data collection, processing and analysis, also in the field of machine learning.
3. Has extended and systematized knowledge in the field of designing algorithms and programming microcontrollers used in vehicles, as well as standards and the use of communication interfaces for exchanging data with vehicle components.

Skills:

1. Is able to formulate and test hypotheses related to complex engineering problems and simple research problems in the area of electromobility, as well as interpret the obtained results and draw critical conclusions.

Social competences:

1. Understands that in the field of technology, knowledge and skills devalue quickly, which requires constant supplementation.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge acquired during the lecture is verified by one 45-minute colloquium during the last lecture. The test consists of 15-20 questions (test and open), scored differently. Passing threshold: 50% of points. Assessment issues, on the basis of which questions are developed, will be sent to students by e-mail using the university e-mail system.

The skills acquired during project classes are verified on the basis of cleared projects. Passing threshold: 50% of points.

Programme content

Discussion of the current AUTOSAR standard, SOME/IP architecture and Car2Cloud, aspects system testing based on SIL / HIL, Model-Based Design Programming.

Course topics

Topics covered during the lecture: detailed discussion of the current AUTOSAR standard, global communication, cloud services and micro-servers in automotive, requirements engineering for communication systems, UI and UX design and ECU development, communication security: encryption, public and private keys and methods of their distribution and storage, user authorization, techniques: OTP, HMAC-SHA1, U2F, familiarization with the SOME/IP and Car2Cloud architecture, system security aspects based on SIL / HIL, review of communication solutions used on the European and American markets.

Issues covered during the projects: operation of AUTOSAR-compliant hardware blocks, testing of programming solutions discussed during the lecture

Teaching methods

1. Lecture: multimedia presentation, illustrated with examples given on the board.
2. Project: multimedia presentation, presentation illustrated with examples given on the board and completion of tasks given by the teacher - practical exercises.

Bibliography

Basic:

1. <https://www.autosar.org/>
2. O. Scheid, AUTOSAR Compendium - Part 1: Application & RTE , CreateSpace Independent Publishing Platform, 2015

Additional:

1. R. Wobst, Kryptologia. Budowa i łamanie zabezpieczeń, RM, Warszawa, 2002.
2. J. Stokłosa, T. Bilski, Tadeusz Pankowski, Bezpieczeństwo danych w systemach informatycznych, PWN, 2001

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 |