COURSE DESCRIPTION CARD - SYLLABUS

Course name
Low-emission drives in transport [N1Trans1>NNwT]

Course

Field of study
Transport

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
part-time

Requirements
elective

Number of hours

Lecture
9

Laboratory classes
9

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

2,00

Coordinators

prof. dr hab. inż. Piotr Lijewski
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Lecturers

Prerequisites

Knowledge: the student has a basic knowledge of vehicle construction and knowledge of physics and thermodynamics. Skills: the student has the ability to read technical drawings and operation diagrams related to vehicle drives. Social competences: the student understands the relationship between ecology and the construction, construction and operation of vehicles with various drives.

Course objective

Presentation of basic information on the construction and operation of modern low-emission road vehicle drive systems.

Course-related learning outcomes

Knowledge:
The student has an ordered, theoretically founded general knowledge of technology, transport systems and various means of transport
The student has knowledge of important development trends and the most important technical achievements and of other related scientific disciplines, in particular transport engineering

Skills:
The student is able to take into account in the process of formulating and solving tasks in the field of transport engineering also non-transport aspects, in particular social, legal and economic issues
The student is able - in accordance with the given specification - to design (create a model of a fragment of reality), formulate a functional specification in the form of use cases, formulate non-functional requirements for selected quality characteristics) and implement a device or a widely understood system in the field of means of transport, using appropriate methods, techniques and tools
The student is able to design elements of means of transport using data on environmental protection

Social competences:
The student understands that in technology, knowledge and skills very quickly become obsolete
The student is aware of the importance of knowledge in solving engineering problems, knows examples and understands the causes of malfunctioning transport systems that have led to serious financial and social losses or to serious loss of health and even life
The student correctly identifies and solves dilemmas related to the profession of a transport engineer

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Discussion with the use of illustrative materials related to modern road vehicle drives.
Written exam

Programme content

Vehicle propulsion systems, structure and operation. The problem of reducing emissions from means of transport. Emissions related to the "life cycle" of the vehicle. Construction and operation of modern combustion engines used in road vehicles. Construction and operation of hybrid drives, types and applications. Construction and components of electric drives for vehicles, batteries and fuel cells (hydrogen). Methods of energy storage in vehicles. Modern alternative fuels used in vehicle drives.

Course topics

Teaching methods

problem lecture / conversation lecture / lecture with multimedia presentation

Bibliography

Basic
1.Merkisz J., Pielecha I., Układy mechaniczane pojazdów hybrydowych. Wydawnictwo Politechniki Poznańskiej,. Poznań 2015.
2.Merkisz J., Pielecha I., Układy elektryczne pojazdów hybrydowych. Wydawnictwo Politechniki Poznańskiej,. Poznań 2015.
Additional
1. Industry materials and magazines (SAE, Automotive Engineering, Engine Powertrain Technology)

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	18	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	32	1,00