COURSE DESCRIPTION CARD - SYLLABUS

Course name
Ecology of Transport [N2Trans1-LogTr>ET]

Course

Field of study
Transport

Year/Semester
1/1

Area of study (specialization)
Logistics of Transport

Profile of study
general academic

Level of study
second-cycle

Course offered in
Polish

Form of study
part-time

Requirements
compulsory

Number of hours

Lecture
18

Laboratory classes
0

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

1,00

Coordinators

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Lecturers

Prerequisites

Assumptions and objectives of the course: general knowledge of the risks associated with human activities currently and the possible consequences in the future, refer to the topics of ecology in industry and transport; hazard classification, general knowledge about alternative sources of propulsion and power of modern vehicles.

Course objective

Getting to know the subject of ecology in transport, general knowledge of methods of measuring emissions from vehicles of various categories, general knowledge of alternative propulsion sources.

Course-related learning outcomes

Knowledge:
1. Has ordered and theoretically founded general knowledge related to key issues in the field of transport engineering - [T2A_W02]
2. Has knowledge of development trends and the most important new achievements of means of transport and other selected related scientific disciplines - [T2A_W04]
3. Knows advanced methods, techniques and tools used in solving complex engineering tasks and

conducting research in a selected area of transport - [T2A_W06]

Skills:
1. Can use information and communication techniques used in the implementation of projects in the field of transport - [T2A_U02]
2. Can plan and conduct experiments, including measurements and simulations, interpret the obtained results and draw conclusions, as well as formulate and verify hypotheses related to complex engineering problems and simple research problems - [T2A_U03]
3. Can, when formulating and solving engineering tasks, integrate knowledge from various areas of transport (and, if necessary, knowledge from other scientific disciplines) and apply a systemic approach, also taking into account non-technical aspects - [T2A_U05]

Social competences:
1. Understands the importance of using the latest knowledge in the field of transport engineering in solving research and practical problems - [T2A_K02]
2. Understands the importance of popularizing activities concerning the latest achievements in the field of transport engineering - [T2A_K03]
3. Is aware of the need to develop professional achievements and observe the rules of professional ethics - [T2A_K04]

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, combined with the assessment of exemplary implementation of engineering diploma theses.
Credit based on a study containing basic information on the student"s engineering diploma thesis.

Programme content

Lecture: environmental conditions in transport; natural resources, social and economic factors; vehicle classification, exhaust gas toxicity standards. The content of the lectures concern:
- overview of the general situation in the world related to the emission of gaseous compounds and particulates from various transport modes,
- discussion of the causes of harmful compounds and solid particles,
- discussion of the method of measuring harmful compounds and solid particles,
- discussion of methods for reducing emissions of harmful compounds and particulate matter,
- discussion of modern drive solutions for means of transport reducing emissions from road sources,
- discussion of legal regulations related to the limitation of harmful compounds and particulate matter in Europe and in the world.
Exercises:
- fuel consumption calculation,
- calculation of emissions in stationary tests,
- road test emissions calculation,
- calculation of specific emissions,
- calculation of emissions on the basis of test results in real operation conditions.

Course topics

Environmental, social and economic conditions of transport. Emissions of harmful gaseous compounds and particulate matter from different modes of transport and the causes of their formation. Emission measurement and reduction methods. Modern low-emission propulsion systems. Emission standards and legal regulations applicable in Europe and worldwide.

Teaching methods

1. Lecture with multimedia presentation
2. Exercises - solving problems

Bibliography

Basic

1. Torsten Schmidt: Pojazdy hybrydowe i elektryczne w praktyce warsztatowej. Wydawnictwa Komunikacji i Łączności WKŁ, 2019.
2. Jerzy Merkisz, Paweł Fuć, Piotr Lijewski, Fizykochemiczne aspekty budowy i eksploatacji filtrów cząstek stałych. Poznań 2016.
3. Jerzy Merkisz, Ekologiczne problemy silników spalinowych, Wyd. Politechniki Poznańskiej, Poznań 1998
4. Uwe Rokosch, Układy oczyszczania spalin i pokładowe systemy diagnostyczne samochodów. ISBN 978-83-206-1657-6.
Additional

Breakdown of average student's workload

	Hours	ECTS
Total workload	40	1,00
Classes requiring direct contact with the teacher	18	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	22	0,50