



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Energy management in transport

Course

Field of study

Year/Semester

Transport

1/2

Area of study (specialization)

Profile of study

Railway Transportation

general academic

Level of study

Course offered in

Second-cycle studies

polish / english

Form of study

Requirements

full-time

elective

Number of hours

Lecture

Laboratory classes

Other (e.g. online)

15

0

0

Tutorials

Projects/seminars

15

0

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

dr hab. inż. Jarosław Bartoszewicz, prof. ucz.

Responsible for the course/lecturer:

mgr inż. Julian Kominowski

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Wydział Inżynierii Środowiska i Energetyki

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Prerequisites

KNOWLEDGE: Knowledge gained during the study of the following subjects: physics, chemistry, thermodynamics, mechanics, economics; has an organized, theoretically founded knowledge of means of transport, their functional properties and basic technical and operational parameters.

SKILLS: Can obtain information from literature, the Internet, databases and other sources, in Polish and foreign languages, can integrate the obtained information, interpret and draw conclusions from it, and create and justify opinions.

SOCIAL COMPETENCES: Is aware of the importance and understands the non-technical aspects and effects of a transport engineer's activity and its impact on the environment as well as responsibility for decisions made, the consequences of their own actions in the short and long term



Course objective

Getting knowledge and acquiring the ability to make a correct analysis and multi-criteria evaluation of energy processes with particular emphasis on the field of transport.

Course-related learning outcomes

Knowledge

Student has knowledge of development trends and the most important new achievements of means of transport and other selected, related scientific disciplines.

Skills

Student is able to make a critical analysis of existing technical solutions and propose their improvements (improvements).

Student is able - in accordance with a given specification, taking into account non-technical aspects - to design a complex device, system in the field of transport engineering or a process and implement this project - at least in part - using appropriate methods, techniques and tools, including adapting the existing or developing new ones tools

Social competences

Student understands that in the field of transport engineering, knowledge and skills very quickly become obsolete.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Discussion, ongoing preparation and activity in class. Credit and written exam.

Programme content

Energy consumption in the life cycle of the transport system, with particular emphasis on vehicles. Basic problems of energy. Indicators of specific energy consumption and exergy, calculation of accumulated energy consumption and exergy. Problems of technical and economic optimization of energy processes and systems used in transport. Energy technologies friendly to the natural environment of man.

Renewable and non-renewable fuels - the possibility of their use in rail transport.

Teaching methods

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

Bibliography

Basic

1. Bałandynowicz H.W. i inni: Energochłonność skumulowana, Polska Akademia Nauk. Instytut Podstawowych Problemów Techniki, Warszawa : Państwowe Wydawnictwo Naukowe, 1983.



2. Gronowicz J.: Energochłonność transportu kolejowego. Trakcja spalinowa, Warszawa, Wydawnictwo Komunikacji i Łączności, 1990.

3. Gronowicz J.: Gospodarka energetyczna w transporcie lądowym, Wydawnictwo Politechniki Poznańskiej, Poznań 2006.

Additional

1. J. Szargut, A. Ziębik - Podstawy energetyki cieplnej, PWN, Warszawa 1998.

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	3,0
Classes requiring direct contact with the teacher	30	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) ¹	20	1,0

¹ delete or add other activities as appropriate