COURSE DESCRIPTION CARD - SYLLABUS

Course name
Combustion engines for vehicles

Course

Field of study
Transport

Year/Semester
3/5

Area of study (specialization)

Profile of study
general academic

Level of study
First-cycle studies

Course offered in
Polish

Form of study
part-time

Requirements
elective

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
18	9	0
Tutorials	**Projects/seminars**	
0	0	

Number of credit points

4

Lecturers

Responsible for the course/lecturer:

dr hab. inż. Jarosław Kałużny

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ul. Piotrowo 3, 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

Knowledge: Base knowledge in machines design and mathematics

Competences: Ability to analyse the informations, resume it and formulate the conclusions and oppinions

Social competences: Student has the basic social competences accordingly to the place and situation; student is for new informations and wants to gain new social competences

Course objective

Base informations in the field of design and operation of combustion engines, focusing on vehicle applications.

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 - 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:

Discussion during the lesson

Mutual or written exam

Programme content

The route from the idea towards the production of the combustion engine.

The general applications and contemporary meaning of combustion engines.

Design, function and operation of the combustion engine, presentation of the models and educational cross-sections.

Base engine parametrs: definition and formula.

Standard and alternative engine fuels, combustion process basics.

Cylinder pressure diagram - functional analysis.

Engine characteristics.

Piston, cylinder and crankshaft: forces, friction and lubrication

Design and function of fuel supply systems, valvetrain, charging, diagnostics and other systems

Systems for emmision controls

Teaching methods

various

Bibliography

Basic

1. Wajand J Tłokowe silniki spalinowe średnio- i szybkoobrotowe WNT, Warszawa 2005

2. Iskra A. Dynamika mechanizmów tłokowych silników spalinowych, Wydawnictwo Politechniki Poznańskiej, Poznań 1995

3. Iskra A. Studium konstrukcji i funkcjonalności pierścieni w grupie tłokowo-cylindrowej, Wydawnictwo Politechniki Poznańskiej, Poznań 1996

4. Iskra A. Parametry filmu olejowego w węzłach mechanizmu tłokowo-korbowego silnika spalinowego Wydawnictwo Politechniki Poznańskiej, Poznań 2001

Additional

1. Silniki Spalinowe kwartalnik

2. Rokosch U. Układy oczyszczania spalin i pokładowe systemy diagnostyczne samochodów, WKŁ, 2007

3. Krzymień A. Łożyska mechanizmu korbowego tłokowych silników spalinowych Wydawnictwo Politechniki Poznańskiej, Poznań 2007

4. Zimbardo P, Psychology and Life, 13th Edition, Allyn and Bacon, Boston, Massachusetts, USA, 1992, tłumaczenie polskie PWN

Breakdown of average student's workload

	Hours	ECTS
Total workload	90	4,0
Classes requiring direct contact with the teacher	27	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	63	3,0

[1] delete or add other activities as appropriate