



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Internal combustion engine systems

Course

Field of study

Year/Semester

Construction and operation of transport means

1/1

Area of study (specialization)

Profile of study

Combustion Engines

general academic

Level of study

Course offered in

Second-cycle studies

polish

Form of study

Requirements

part-time

compulsory

Number of hours

Lecture

Laboratory classes

Other (e.g. online)

18

9

0

Tutorials

Projects/seminars

9

0

Number of credit points

4

Lecturers

Responsible for the course/lecturer:

DSc. DEng. Piotr Lijewski prof. PUT

Responsible for the course/lecturer:

second person allowed

Prerequisites

KNOWLEDGE: the student has basic general knowledge about the construction of the surrounding world and the laws that govern it

SKILLS: the student is able to integrate the obtained information, interpret it, draw conclusions, formulate and justify opinions

SOCIAL COMPETENCES: the student is aware of the social and economic importance of environmental protection

Course objective

Providing basic information on the construction and construction of internal combustion engine systems, mainly automotive ones, taking into account the latest solutions.

Course-related learning outcomes

Knowledge

1. Has in-depth knowledge of the construction and principles of operation and classification of machines from a selected group.



2. Has a general knowledge of the types of research and methods of testing working machines with the use of modern measurement techniques and data acquisition.

Skills

1. Can develop a technical description, offer and design documentation for a complex machine from a selected group of machines.
2. Can formulate and test hypotheses related to simple research problems.

Social competences

1. Is ready to critically assess the knowledge and content received.
2. Is ready to recognize the importance of knowledge in solving cognitive and practical problems and to consult experts in case of difficulties in solving the problem on its own..

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written / oral exam. Mandatory individual reports on laboratory activities. Final credit of exercises.

Programme content

Construction of diesel and spark ignition engine systems: power supply, timing, supercharging, exhaust gas treatment. Operation of engine systems. Influence of operating parameters of selected systems, e.g. power supply, on engine performance indicators - power, torque, efficiency, emission of toxic exhaust gases. Influence of operating parameters of selected systems on the course of the combustion process. Development trends of internal combustion engine systems.

Teaching methods

1. Lecture with multimedia presentation
2. Exercises - solving problems
3. Laboratory classes - measurements on engine test bench

Bibliography

Basic

1. Serdecki W. (red.): Badania silników spalinowych. Laboratorium. WPP, Poznań, 2012 lub późniejsze wydania.
2. Wajand Jan A., Wajand Jan T.: Tłokowe silniki spalinowe średnio- i szybkoobrotowe. WNT, Warszawa, 2005.
3. Niewiarowski K.: Tłokowe silniki spalinowe. WKiŁ, Warszawa, 1983.

Additional

1. Materials of engine producers, conference and industry materials: Combustion Engines, MTZ, SAE



Breakdown of average student's workload

	Hours	ECTS
Total workload	86	4,0
Classes requiring direct contact with the teacher	36	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) ¹	50	2,0

¹ delete or add other activities as appropriate