



Course title: Combustion engines

ECTS credit allocation (and other scores): 3ECTS

Semester: spring

Level of study: ISCED-6 - first-cycle programmes (EQF-6)

Branch of science: Engineering and technology

Language: English

Number of hours per semester: Lectures 30, Classes: 30

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Type of classes: classes and lectures

Substantive content

CLASSES: Calculation of theoretical efficiency of internal combustion engines, examination of the influence of compression ratio on the theoretical efficiency of engines. Calculation of indicators of internal combustion engine operation. Calculations of the crank-piston system of internal combustion engines. Analysis of the indicator diagram. General structure of modern internal combustion engine systems: crank and piston, timing, cooling, lubrication, fuel supply systems. Engine supercharging systems. Preparation of engine characteristics.

LECTURES: Theoretical and real cycles of internal combustion engines. Energy transformations in the engine, related to the fuel combustion process and the formation of toxic compounds. Indicators of engine work efficiency and its characteristics. Kinematics and dynamics of crank-piston systems, balancing of crank-piston systems. Construction of individual engine systems. General structure of power supply systems for spark ignition and compression ignition engines. The impact of motorization on the natural environment. Unconventional solutions for internal combustion engines.

Learning purpose: Preparing for the practical use, maintenance, and diagnostics of internal combustion engines.

On completion of the study programme the graduate will gain:

Knowledge: Student has knowledge of the thermal processes taking place in the internal combustion engine.

Skills: Student is able to determine correct operating conditions of the engine.

Social Competencies: Student is able to assess the impact of internal combustion engines on the natural environment

Basic literature:

1 Rychter T., Teodorczyk A.: Teoria silników tłokowych, WKŁ 2006

2 Luft S., Podstawy budowy silników, WKŁ 2006

3 Merkisz J., Ekologiczne problemy silników spalinowych, Wyd. Polit. Poznańskiej 1998

Supplementary literature:

Engine manufacturers' materials, conference and industry materials and magazines: Combustion Engines, SAE

The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 60

Student's independent work: 15