



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Gas Engines

Course

Field of study

Year/Semester

Area of study (specialization)

Profile of study

general academic

Level of study

Second-cycle studies

Course offered in

english

Form of study

full-time

Requirements

compulsory

Number of hours

Lecture

15

Laboratory classes

0

Other (e.g. online)

0

Tutorials

0

Projects/seminars

15

Number of credit points

6

Lecturers

Responsible for the course/lecturer:

dr inż. Michał Gołębiewski

Responsible for the course/lecturer:

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Faculty of Environmental Engineering and Energetic

ul. Piotrowo 3 60-965 Poznań

Prerequisites

Students should have basic information about: thermodynamic, mechanics, fluid mechanics, strength of materials

Course objective

To acquaint students with the theoretical and practical problems related to the flow issues, materials issues and exploitation parameters of internal combustion gas engines.

Course-related learning outcomes

Knowledge

Student has expanded knowledge necessary to understand gas engines and specialist knowledge about



construction, methods of designing, manufacturing, operating, safety systems as well as impact on the economy, society and the environment in the field of gas engines

Student has extended and deep knowledge in the field of gas engines

Student has deep knowledge of operational parameters impact on the efficiency of gas engines and functioning of energy systems

Skills

Student is able to use his knowledge to find right sources and interpret founded information in order to solve both standard and non-standard problems related with gas engines

Student is able to solve research and engineering tasks requiring the use of engineering standards and norms as well as the use of technologies appropriate for gas engines, using experience gained in an professional environment engaged in engineering activities

Student use a foreign language at B2 + level (at European Language Training Description System) and specialized terminology related to gas engines

Social competences

Student is ready to recognize the importance of knowledge in solving cognitive and practical problems and to seek expert opinions in case of difficulties in solving the problems on field of gas engines

Student is ready to fulfill social obligations as well as inspire and organize activities for the social environment

Student is ready to perform responsible professional roles, taking into account changing social needs, including:

- development of the profession's achievements,
- maintainance the profession ethos,
- compliance of professional development with ethics principles and introduce actions to comply with these principles

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture - the written examination - The evaluation of student knowledge will be held based on an answers on 5 questions from the material presented during the lectures

Programme content

Construction of gas engines, internal combustion engines processes, rotary combustion engines, Stirling engines, exploitation of internal combustion gas engines, development trends in gas engines construction, work's cycles, turbocharging, ignition methods, diagnostic methods of engines, emission of



toxic compounds and its reduction, engine failures, combustion an unusual gases in engines, lubrication system.

Teaching methods

Lecture: multimedia presentation, illustrated with examples on the board

Project: solving of an engineering problems with using databases and numerical programs.

Bibliography

Basic

Heywood J.B., Internal Combustion Engine Fundamentals

C.R. Ferguson and A.T. Kirkpatrick, Internal Combustion Engines Applied Thermosciences,

Stone R., Introduction to Internal Combustion Engines

Additional

Willard W. Pulkrabek, Engineering Fundamentals of the Internal Combustion Engine

Breakdown of average student's workload

	Hours	ECTS
Total workload	150	6,0
Classes requiring direct contact with the teacher	35	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) ¹	115	5,0

¹ delete or add other activities as appropriate