POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

pl. M. Skłodowskiej-Curie 5, 60-965 Poznań

COURSE DESCRIPTION CARD - SYLLABUS

Course name

Problems of hydrodynamic lubrication

Course

Field of study	Year/Semester
Mechanical and Automotive Engineering	1/2
Area of study (specialization)	Profile of study
Hybrid powertrain systems	
Level of study	Course offered in
	polish
Form of study	Requirements

Number of hours

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

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

dr hab. inż. Jarosław Kałużny

email: jaroslaw.kaluzny@put.poznan.pl

tel. 61-6652049

Wydział Inżynierii Lądowej i Transportu

ul. Piotrowo 3, 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

Knowledge: Base knowledge in design and function of combustion engines; base knowledge in mechanics of fluids

Competences: Ability to read and understand diagrams, technical scetches etc.

Social competences: Understanding of continuous personal developement; understanding of the impact of engineering products on the human environment.

Course objective

Analysis of the process of piston-cylinder friction. Hydrodynamic theory of lubrication.

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Course-related learning outcomes

Knowledge

Has extended knowledge of thermodynamics and fluid mechanics to the extent necessary to understand the principle of operation and calculations of thermodynamic and flow processes occurring in working machines such as heating, cooling, drying, thermal and pressure agglomeration, etc., pneumatic transport, energy conversion, etc.

Has extensive knowledge of the processes taking place in the surface layer of machine structural elements and surface engineering methods.

Has general knowledge of standardization, EU recommendations and directives, national, industry and international standards systems, and industrial standards.

Skills

Can formulate and test hypotheses related to simple research problems.

Can plan and carry out experimental research of specific processes taking place in machines and routine tests of a working machine or a vehicle from a selected group of machines.

Is able to carry out basic measurements of mechanical quantities on the tested working machine with the use of modern measuring systems.

Social competences

He is ready to critically assess his knowledge and received content.

It is ready to initiate actions for the public interest.

Is ready to fulfill professional roles responsibly, taking into account the changing social needs, including.

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

- Parts of the piston-cylinder group: materials, design and function

- Methods for oil film parameter calculation

- Navier-Stockes equation in the application to the cylinder liner and journal bearings

- Nanomaterials in friction and lubrication

Teaching methods

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various

Bibliography

Basic

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

2. Zima S., Kurbeltriebe. Vieweg GmbH. Braunschweig, Wiesbaden 1999

Additional

Köhler E., Verbrennungsmotoren ? Motormechanik, Vieweg ? ATZ-MTZ-Fachbuch, Braunschweig/Wiesbaden 2002

Breakdown of average student's workload

	Hours	ECTS
Total workload	45	3,0
Classes requiring direct contact with the teacher	27	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	18	1,0

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[1] delete or add other activities as appropriate