



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Lubricants and anti-wear materials [S1MiTPM1>MSiP]

Course

Field of study	Year/Semester
Materials and technologies for automotive industry	3/5
Area of study (specialization)	Profile of study
–	general academic
Level of study	Course offered in
first-cycle	Polish
Form of study	Requirements
full-time	compulsory

Number of hours

Lecture	Laboratory classes	Other
15	15	0
Tutorials	Projects/seminars	
0	0	

Number of credit points

2,00

Coordinators

dr hab. inż. Adam Piasecki prof. PP
adam.piasecki@put.poznan.pl

Lecturers

Prerequisites

Basic knowledge of chemistry, physics, materials science. Logical thinking, use of the information obtained from the library and the Internet. Understanding the need for learning and acquiring new knowledge,

Course objective

Learning about lubricants and anti-wear materials which are used in automotive industry. Knowledge of lubricants research methods.

Course-related learning outcomes

Knowledge:

1. Student should know the properties of lubricants and anti-wear materials used in automotive industry.
2. Student should know the research methods of the lubricants and anti-wear materials.

Skills:

1. Student is able to select a lubricant material depending on the working environment.
2. Student is able to investigate the properties of lubricants and anti-wear materials.

3. Student is able to analyze the results of the investigation of lubricants and anti-wear materials.

Social competences:

1. Student is able to work in a group.
2. The student is aware of the importance of modern microscopic methods in the study of materials in modern economy and for society.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: - credit on the basis of a test consisting of both open and test questions carried out at the end of the semester.. Scale of estimate: 51-60% - dst(C), 61-70% - dst+(C+), 71-80% - db(B), 81-90% - db+(B+), 91-100% - bdb(A).

Laboratory classes: evaluation of students knowledge necessary to prepare, and carry out the lab tasks and evaluation of reports.

Programme content

During the course student learn about lubricants and anti-wear materials used in e.g. automotive industry and method of their research.

Course topics

Lecture: Friction. Tribological systems. Characteristics of lubricants and anti-wear materials. Trends in development of lubricants and anti-wear materials. Solid, plastic lubricants and oils. Lubrication mechanism. Research methods of the properties of lubricants and anti-wear materials.

Laboratory classes: : 1. Investigation of the tribological properties of frictional pair - dry friction (part 1). 2. Investigation of the tribological properties of frictional pair - fluid friction (part 2). 3. Investigation of the properties of the solid lubricants. 4. Investigation of the properties of plastic lubricants and oils. 5. Wear surface analysis.

Teaching methods

multimedia presentations

Bibliography

Basic:

1. Burakowski T., Areologia. Podstawy teoretyczne, Instytut Technologii Eksploatacji - PIB / 2013.
2. Blicharski M., Inżynieria powierzchni, Wyd. PWN, 2021.
3. Urbaniak W., Smarowanie powierzchni biologicznych i inżynieryjnych substancjami o budowie warstwowej, Wyd. Uniwersytetu Kazimierza Wielkiego, Bydgoszcz, 2015.

Additional:

1. Klimpel A.: Napawanie i natryskiwanie cieplne. WNT Warszawa 2000.
2. Praca Zbiorowa. Poradnik Galwanotechnika. WNT Warszawa 2002.
3. Menezes Pradeep L., Rohatgi Pradeep K., Omrani E., Self-Lubricating Composites, Springer 2018.

Breakdown of average student's workload

	Hours	ECTS
Total workload	55	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	25	1,00