POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Microscopy methods in the examination of vehicle parts [S1MiTPM1>MMwBCP]

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

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Lecturers

Prerequisites

Basic knowledge of chemistry, physics, materials science, and basic microscopy techniques: light and electron microscopy. 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 microscopy methods with particular emphasis on vehicle parts. Expanding knowledge acquired in the subject: Microscopy methods in materials testing.

Course-related learning outcomes

Knowledge:
1. The student should know microscopy methods of examining vehicle parts.
2. The student should know the preparation methodology for examining vehicle parts using microscopy methods.
3. The student should know the physical basis of various microscopy methods used in automotive.

Skills:

1. The student is able to select a research method that leads to obtaining the correct result.
2.The student is able to independently perform tests of vehicle parts using microscopy methods.
3. The student is able to interpret the results of vehicle parts tests obtained using microscopy methods.

Social competences:
1. Student is able to work in a group.
2. The student is aware of the importance of modern microscopy methods in the study of vehicle parts in the modern economy and 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, students will learn about microscopy methods used in the automotive industry.

Course topics

Lecture: Macroscopic examination of vehicle parts. Confocal microscopy. Digital microscopy. Modern observation techniques in light and electron microscopy. X-ray microanalysis EDS and WDS. Examples of the use of microscopic methods and sample preparation in production plants.
Laboratory classes: 1. Macroscopic examination. 2. Digital microscopy. 3. Scanning electron microscopy in the examination of vehicle parts. 4. EDS X-ray microanalysis. 5. Preparation of intermediate replicas - microscopic observations and interpretation.

Teaching methods

multimedia presentations.

Bibliography

Basic:
1. A. Barbacki (red.), Mikroskopia elektronowa, Wyd. PP, 2007.
2. A. Barbacki (red.), Metody i techniki strukturalnych badań metali, Wyd. P.P., Poznań 1994.
3. L.A. Dobrzański, E. Hajduczek, Metody badań metali t. 2, WNT 1987.

Additional:
1. Kurzydłowski K., Lewandowska M., Nanomateriały inżynierskie konstrukcyjne i funkcjonalne,Wyd. PWN. 2010.

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	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)	20	1,00