COURSE DESCRIPTION CARD - SYLLABUS

Course name
Construction materials used for automotive body and chassis systems [S1MiTPM1>MKnNPiwUP]

Course

Field of study
Materials and technologies for automotive industry

Year/Semester
3/6

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
15

Laboratory classes
15

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

Knowledge: basics of chemistry, physics and science of materials. Skills: the ability to think logically, use of information obtained from libraries and the Internet. Social competencies: understanding the need to learn and acquire new knowledge.

Course objective

Familiarization with construction materials from the all group of engineering materials used for vehicle bodies and chassis systems. Familiarization with the technology, microstructure and properties obtained in the production of parts intended for the automotive industry.

Course-related learning outcomes

Knowledge:
1. Student should be able to list the basic automotive parts used for bodies and chassis and should be able to assign them the group of engineering materials from which they are made.
2. Student should characterize the microstructure and properties typical of the group of materials used for chassis and chassis systems.

Skills:
1. Student is able to list the basic parts used for bodies and chassis in the automotive industry and is able to identify the group of materials from which they are made.
2. Student is able to determine the structure and properties of materials intended for car body and chassis parts.

Social competences:
1. Student is willing to work in a group to solve problems.
2. Student is aware of the role of construction materials for parts intended for the automotive industry.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

End-of-semester grade:
a) in the scope of laboratory classes, based on oral or written answers to each exercise, and a report on its progress according to the instructor's instructions. The final grade is obtained based on the average of all positive grades from the answers and reports.
b) in terms of lectures based on a written assessment conducted during the last classes.
Final grade criteria:
<90–100> 5.0 (A); <80–90) 4.5 (B); <70–80) 4.0 (C); <60–70) 3.5 (D); <50–60) 3.0 (E); <0–50) 2.0 (F)

Programme content

Construction materials used for vehicle bodies and chassis systems, including all groups of engineering materials. Getting acquainted with the microstructure of selected automotive parts, the most frequently used production technology and the obtained properties ensuring favorable operating conditions.

Course topics

Lecture:
1. General construction of vehicles in terms of engineering materials used for vehicle bodies and chassis.
2. Construction materials used for vehicle bodies (supporting structure and body car).
3. Construction materials used in the braking system.
4. Construction materials used in the steering system.
5. Construction materials used in the drive system.
6. Construction materials used in the suspension system.
7. Materials used for mechanical connections in the automotive industry.
Laboratory:
1. Analysis of the structure and properties of materials used for vehicle bodies.
2. Analysis of the structure and properties of materials used in the braking system.
3. Analysis of the structure and properties of materials used in the steering system.
4. Analysis of the structure and properties of materials used in the drive system.
5. Analysis of the structure and properties of materials used in the suspension system.

Teaching methods

Lecture: multimedia presentation, examples of samples after various processes, discussion.
Laboratory: practical exercises, discussion.

Bibliography

Basic:
1. Barbacki A. i in.: Materiały w budowie maszyn. Wydawnictwo Politechniki Poznańskiej. Poznań 2006
2. Barbacki A. i in.: Metaloznawstwo dla mechaników. Wydawnictwo Politechniki Poznańskiej. Poznań 1995
3. Ciszewski A.: Materiałoznawstwo. Oficyna Wydawnicza Politechniki Warszawskiej. Warszawa, 2009
4. Dobrzański L.: Metalowe materiały inżynierskie. WTN. Warszawa, 2004
5. Przybyłowicz K.: Inżynieria stopów żelaza. Wydawnictwo Politechniki Świętokrzyskiej. Kielce, 2008
6. Gabryelewicz M.: Podwozia i nadwozia pojazdów samochodowych. Budowa, obsługa, diagnostyka i naprawa. Wydawnictwa Komunikacji i Łączności. Warszawa 2018
7. Głowacka M., Łabanowski J., Landowski M.: Współczesne materiały inżynierskie. Wybrane grupy materiałów. Wydawnictwo Politechniki Gdańskiej. Gdańsk 2021

8. Głowacka M. i in.: Metaloznawstwo. Materiały do ćwiczeń laboratoryjnych. Wydawnictwo Politechniki Gdańskiej. Gdańsk 1996
9. Hucińska J. i in.: Metaloznawstwo. Materiały do ćwiczeń laboratoryjnych. Wydawnictwo Politechniki Gdańskiej. Gdańsk 1995
10. Kaczorowski M., Krzyńska A.: Konstrukcyjne materiały metalowe, ceramiczne i kompozytowe. Oficyna Wydawnicza Politechniki Warszawskiej. Warszawa 2017
11. Leda H.: Materiały w budowie maszyn i aplikacjach medycznych. Wydawnictwo Politechniki Poznańskiej. Poznań 2008
12. Lisica A., Ostrowski B., Ziewiec W.: Laboratorium materiałoznawstwa. Wydawnictwo Politechniki Radomskiej. Radom 2009

Additional:
1. Krajczyk A.: Podręczny atlas mikrostruktur metali i stopów. Oficyna Wydawnicza Politechniki Wrocławskiej. Wrocław 2005
2. Przybyłowicz K.: Metody badania tworzyw metalicznych. Wydawnictwo Politechniki Świętokrzyskiej. Kielce 2011

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