

Nazwa w jęz. angielskim: *Material science*

Dane dotyczące zajęć:
Information on course:

Jednostka oferująca: Wydział Inżynierii Środowiska i Energetyki // dr inż. Krzysztof Nawrat
Course offered by: Faculty of Energy and Environmental Engineering // dr inż. Krzysztof Nawrat

Język wykładowy:
Angielski
Language:
English
Strona WWW: Course homepage:
Skrócony opis:
Short description:
The subject introduces engineering materials used in technology. Main goal: to become familiar with various engineering materials, learn their basic properties and learn selected materials testing methods. Contact classes: lecture + laboratory exercises
Opis:
Description:
LECTURE The importance of engineering materials in the construction and operation of machines. Matter and its components. General characteristics of materials. Material structure: chemical bonds, structures, crystalline defects. The influence of structure on properties. Equilibrium phase diagrams. Modifying the structure and properties of engineering materials using technological methods. Natural and engineering technical materials. Material properties and applications. Steels and cast iron alloys. Non-ferrous metals and their alloys. Sintered and ceramic materials. Glasses and glass ceramics. Polymeric and composite materials. LABORATORY Studying the behavior of polymers under tension. Testing a coiled spring. Testing surface roughness. Testing regenerative materials. Material hardness measurements. Testing the properties of oils. Testing materials for flat gaskets. Equilibrium phase diagram. Testing the abrasion resistance of engineering materials. Material selection using the 0-1 method. FINAL TEST, PASSING THE LAB Number of hours of classes with direct participation of academic teachers or other persons teaching courses and students. Lecture: 15 h Laboratory: 30 h Number of ECTS credits: 3
Literatura:
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Bibliography:
• Jones D., Ashby M.: „Engineering Materials 1. An Introduction to Properties, Applications and Design”, Butterworth-Heinemann • Ashby M., Jones D.: „Engineering Materials 2. An Introduction to Microstructures, Processing and

- Design", Butterworth-Heinemann
- Ashby M.: „Materials Selection in Mechanical Design", Butterworth-Heinemann
- Shackelford James F. „Introduction to Materials Science for Engineers", Pearson Education International

Efekty uczenia się:

Learning outcomes:

Knowledge: the student knows and understands

1. Basic types of materials, their properties and areas of their application (K1A_W01);
2. The notion of a structure of materials, the impact of phase transformations on the change in the structure of materials and their properties change (K1A_W02);
3. Basic types of formation ways a structure and properties of materials (K1A_W05).

Skills: the student can

4. Plan and conduct selected research experiments on the properties of materials, interpret the obtained results and draw conclusions from the obtained research results (K1A_U02).
5. Work individually and in a team to conduct an experiment (K1A_U05).

Metody i kryteria oceniania:

Assessment methods and assessment criteria:

The final grade [FG] for the course consists of:

[A] Passing the thematic tests - average ≥ 0 (multiple-choice tests)

[B] Passing the laboratory - average, with passing each laboratory exercise - grade ≥ 3 required:

- class participation,
- report submission,
- oral response, quiz.

[C] Passing the Final Test - grade ≥ 3 (multiple-choice test, open-ended questions).

$$FG = A \cdot 0,2 + B \cdot 0,3 + C \cdot 0,5$$

Final grade limits

FG grade to USOS

$\geq 4,80$ 5,0

$\geq 4,30$ 4,5

$\geq 3,80$ 4,0

$\geq 3,30$ 3,5

$\geq 3,00$ 3,0

The syllabus is valid from the summer semester of the 2024/2025 academic year, and its content is not subject to change during the semester.

Przynależność do grup przedmiotów w cyklach: Element of course groups in various terms:

Opis grupy przedmiotów Course group description	Cykl pocz. First term	Cykl kon. Last term
przedmioty obieralne studia stacjonarne stopień studiów – dowolny kierunek studiów – dowolny, semestr dowolny elective courses full-time degree - any field of study - any	2024/25	

semester - any		
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