

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Material sciences & elements of chemistry		Code 1011101331010242795
Field of study Logistics - Full-time studies - First-cycle studies	Profile of study (general academic, practical) general academic	Year /Semester 2 / 3
Elective path/specialty -	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 30 Classes: - Laboratory: 15 Project/seminars: -		No. of credits 2
Status of the course in the study program (Basic, major, other) other		(university-wide, from another field) university-wide
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 2 100% 2 100%
Responsible for subject / lecturer: dr inż. Andrzej Miklaszewski email: andrzej.miklaszewski@put.poznan.pl tel. 61 665 3665 Faculty of Mechanical Engineering and Management Piotrowo 3 Street, 60-965 Poznań		Responsible for subject / lecturer: dr inż. Andrzej Miklaszewski email: andrzej.miklaszewski@put.poznan.pl tel. 61 665 3665 Faculty of Mechanical Engineering and Management Piotrowo 3 Street, 60-965 Poznań
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic knowledge of chemistry, physics
2	Skills	Logical thinking, use of the information obtained from the library and the Internet
3	Social competencies	Understanding the need for learning and acquiring new knowledge
Assumptions and objectives of the course: -To know the nature, methods of manufacture, the structure and properties of materials		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. The student has a systematic general theoretical knowledge covering the key issues from the scope of the materials science. (T1A_W03) - [K_W08]		
2. The student has a systematic general theoretical knowledge on engineering materials. (T1A_U01) - [K_W10]		
Skills:		
1. The student can obtain information concerning materials engineering from literature, databases and other properly selected sources (also in English). (T1A_U01) - [K_U01]		
2. The student has the ability to self-study. (T1A_U05) - [K_U05]		
Social competencies:		
1. The student understands the need of the learning by the whole life; can inspire and organize the learning of others. (T1A_K01) - [K_K01]		
2. The student is aware of importance and understanding the different aspects and effects of engineering activity, including its impact on the environment and the associated responsibility for decisions. (T1A_K02, InzA_K01) - [K_K02]		
Assessment methods of study outcomes		

Lecture: formative assessment - activity cards, summary evaluation - written exam consisting of general and test questions (pass if at least 51% of points are obtained: <51% 2 - ndst, 51% -62% 3 - dst, 63% - 72% 3.5 - dst +, 73% -83% 4 - db, 84% - 94% 4,5 - db +,> 94% 5 - very good) carried out in the examination session.

Laboratories: formative assessment - current activity in class and report on each class, summary evaluation - average of the evaluation form

Course description

-Lecture:

1. Classification and characteristics of materials: metals, polymers, ceramics, composites.
2. Other categories of materials division: structural, functional, ecomaterials, biomaterials
3. The structure of materials on a macro, micro and nano scale.
4. Bonds, crystalline structure.
5. Defects of crystalline materials: point, linear, spatial.
6. The most important properties of materials: physical, chemical, mechanical, technological, and operational.
7. Basic methods for testing the properties of materials.
8. Fundamentals of thermodynamics and diffusion in materials.
9. Phase equilibrium systems, metal alloys, phases, solutions.
10. Mechanism of metal crystallization.
11. Characteristics of phase transformations and their classification.

Teaching methods:

Lecture - informative and conversational lecture

Laboratory - laboratory method

Basic bibliography:

1. Blicharski M. Wstęp do inżynierii materiałowej. WNT, Warszawa, 2003.
2. Przybyłowicz K. Metaloznawstwo, WNT, Warszawa, 2007.
3. Dobrzański L. Podstawy nauki o materiałach i metaloznawstwo. WTN, Warszawa, 2002.

Additional bibliography:

1. Materiały inżynierskie tom. 1 i 2, Ashby M.F., Jones D.R.H., WNT, 2004.
2. Współczesne materiały konstrukcyjne i narzędziowe, Leda H. , Wydawnictwo Politechniki Poznańskiej, Poznań, 1996
3. Wybrane metalowe materiały konstrukcyjne ogólnego przeznaczenia, Leda H. , Wydawnictwo Politechniki Poznańskiej, Poznań, 1997
4. Strukturalne aspekty własności mechanicznych wybranych materiałów, Leda H. , Wydawnictwo Politechniki Poznańskiej, Poznań, 1998

Result of average student's workload

Activity	Time (working hours)
1. lecture	30
2. laboratory	15
3. consultation	1
4. individual work of the student	10

Student's workload

Source of workload	hours	ECTS
Total workload	56	2
Contact hours	46	1
Practical activities	15	1