STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Physical Aspects of Materials Science		**1010604211010622031**
Field of study: **Transport**	Profile of study (general academic, practical): **(brak)**	Year /Semester: **1 / 1**
Elective path/specialty: **-**	Subject offered in: **Polish**	Course (compulsory, elective): **obligatory**
Cycle of study: **First-cycle studies**	Form of study (full-time,part-time): **part-time**	
No. of hours: Lecture: **12** Classes: **10** Laboratory: **-** Project/seminars: **-**		No. of credits: **3**
Status of the course in the study program (Basic, major, other): **(brak)**	(university-wide, from another field): **(brak)**	
Education areas and fields of science and art: **technical sciences**		ECTS distribution (number and %): **3 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic knowledge of physics, mathematics and chemistry.
2	**Skills**	The ability to effectively self-education.
3	**Social competencies**	He is aware of the social role of the engineer. It manifests a desire to broaden their competence. He can work in a team.

Assumptions and objectives of the course:

Understanding microstructure and selected properties of solids used in engineering practice.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. He has expertise in the field of physics including Einstein - [K1A_W01]
2. It has a basic knowledge in the field of chemistry in terms of the understanding of science lectures for the protection of the environment, the doctrine of fuels and lubricants, materials science, comparing the structure and properties of engineering materials and construction materials. - [K1A_W03]

Skills:

1. Can obtain information from the literature related to the science of materials. - [K1A_U01]
2. Can communicate in a professional environment using the concepts and definitions known in the classes of the subject Physical Aspects of Materials. - [K1A_U01]

Social competencies:

1. Understands the need and knows the possibilities of lifelong learning, knows the need for new knowledge in order to develop professional - [K1A_K01]
2. Is aware of and understands the validity of the non-technical aspects and effects of activities in mechanical engineering and its impact on the environment and responsibility for decisions - [K1A_K02]
3. Able to work in a professional manner in their professional relations, compliance with the rules of professional ethics and respect for the diversity of cultures, work in a team of professionals of different disciplines. - [K1A_K03]

Assessment methods of study outcomes

http://www.put.poznan.pl/

Written examination covering the topics discussed in the lecture.
Written examination regarding the material discussed in the exercises.

Course description

Introduction to solid state physics. Solids and Materials Engineering. Breakdown of solids used in engineering practice. Breakdown properties of solids. The atomic structure of solids (basic types of networks, examples of network solids, diffraction on crystals). Imperfections in crystals networks - dislocations. The movement of atoms in the crystal networks - diffusion. Mechanical properties of solids (elasticity, plasticity, fracture, fatigue, creep). Electric and magnetic properties of solids. Thermal properties. Porous solid centers. Physical and mathematical models of solids.

Basic bibliography:

1. C. Kittel, Wstęp do fizyki ciała stałego, PWN, Warszawa 1974
2. B. N. Buszmanow, J. A. Chromow, Fizyka ciała stałego, WNT, Warszawa 1973
3. D. R. Askeland, The science and engineering of materials, PWS Publishers, Boston 1985

Additional bibliography:

1. M. F. Ashby, D. R. H. Jones, Materiały inżynierskie, t.1 i 2, WNT, Warszawa 1996

Result of average student's workload

Activity	Time (working hours)
1. Participation in the lecture	12
2. Fixation of the lecture	4
3. Consultation	4
4. Preparation for the exam / credit	4
5. Participation in exams / completing	2
6. Participation in exercises	10
7. Strengthening exercises content	3
8. Consultations on the content provided on exercises	2
9. Preparing to pass	2
10. Participation in completing	2

Student’s workload

Source of workload	hours	ECTS
Total workload	45	3
Contact hours	32	2
Practical activities	0	0

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