

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Materials Science		Code 1011101321010230142
Field of study Management - Full-time studies - First-cycle	Profile of study (general academic, practical) (brak)	Year /Semester 1 / 2
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 4
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 study effects leading to the acquisition of engineering qualifications		ECTS distribution (number and %) 4 100%
Responsible for subject / lecturer: Maciej Tuliński email: maciej.tulinski@put.poznan.pl tel. 061 665 3628 Wydział Budowy Maszyn i Zarządzania ul. Piotrowo 3, 60-965 Poznań		Responsible for subject / lecturer: Mieczysław Jurczyk email: mieczyslaw.jurczyk@put.poznan.pl tel. 61 665 3508 Wydział Budowy Maszyn i Zarządzania ul. Piotrowo 3, 60-965 Poznań
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic knowledge of physics and mathematics (program basis for high school level)
2	Skills	Ability to solve basic problems of physics on the basis of existing knowledge, the ability to obtain information from identified sources
3	Social competencies	Understanding the need to broaden the competence, willingness to work together as a team
Assumptions and objectives of the course:		
1 Provide students with basic knowledge of materials, to the extent specified by the content of the program relevant to the field of study		
2 Development of students' ability to solve simple problems related to the choice of materials, distinguishing between materials and analysis of the results of microscopic observations based on the gained knowledge		
3 Development of students' teamwork skills		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. To explain the purpose and meaning of the technology of materials and their further processing - [K07-InzA_W5]		
2. To explain the purpose and importance of recycling of engineering materials - [K01-InzA_W01]		
3. To connect the microstructure of the material with its physico-chemical and mechanical properties etc., and on this basis to suggest the potential use - [K04-InzA_W02]		
Skills:		
1. To formulate simple conclusions on the basis of the calculations and results of measurements and conducted observations - [K01-InzA_U1]		
2. To choose materials with suitable physicochemical and structural properties for engineering applications - [K01-InzA_U7, K01-InzA_U8, K01-InzA_U12]		
3. To choose the appropriate production technologies in order to shape the products, their structure and properties - [K01-InzA_U7, K01-InzA_U6]		
Social competencies:		
1. To actively engage in solving the questions, independently develop and expand skills - [K1A_K01]		
2. To work together as a team, to discharge the duties assigned to the division of labor in a team, demonstrate responsibility for own work and the responsibility for the results of the team's work - [K1A_K02]		

Assessment methods of study outcomes		
<p>Assessment:</p> <p>a) in the laboratory: on the basis of the current progress of the tasks assessed by written work-report</p> <p>b) in respect of lectures: on the basis of answers to questions about the material assimilated in previous lectures,</p> <p>Assessment summary:</p> <p>a) in the laboratory on the basis of grade average of partial evaluation</p> <p>b) in respect of lectures: a written test exam. The exam can be applied after completion of laboratories.</p> <p>Assessment based on a written test of knowledge:</p> <p>3 50.1% -70.0%</p> <p>4 70.1% -90.0%</p> <p>5 from 90.1%</p>		
Course description		
<p>Matter and its components.</p> <p>Rules for selection of engineering materials.</p> <p>Basis of material design. Sources of information on engineering materials, their properties and applications.</p> <p>The strengthening of metals and alloys and shaping their structure and properties with technological methods (crystallization, plastic deformation, recrystallization, thermo-forming, phase transformations during heat treatment, diffusion, coatings and surface layers).</p> <p>Working conditions and mechanisms of wear and decohesion (mechanical properties, fracture toughness, fatigue, creep, corrosion, tribological wear).</p> <p>Steels, ferrous casting, non-ferrous metals and their alloys.</p> <p>Sintered materials and ceramic, glass and glass ceramics.</p> <p>Polymeric materials and composites.</p> <p>Modern functional and special materials.</p> <p>Methods of testing materials.</p>		
Basic bibliography:		
<p>1. L. A. Dobrzański, Wprowadzenie do nauki o materiałach, Wydawnictwo Politechniki Śląskiej, Gliwice 2007</p> <p>2. M. Blicharski, Wstęp do inżynierii materiałowej, Wydawnictwo Naukowo-Techniczne 2009</p>		
Additional bibliography:		
<p>1. M. Jurczyk, Nanomateriały, Wydawnictwo Politechniki Poznańskiej, Poznań 2001</p> <p>2. Ch. Kittel, Fizyka ciała stałego, PWN Warszawa 1996</p>		
Result of average student's workload		
Activity	Time (working hours)	
1. Participation in classes	45	
2. Preparation for laboratory	20	
3. Consultations	20	
4. Preparation for the exam	20	
5. Exam	5	
Student's workload		
Source of workload	hours	ECTS
Total workload	110	4
Contact hours	70	2
Practical activities	55	2