

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Materials Science</b>		Code <b>1011101221011100142</b>
Field of study <b>Engineering Management - Full-time studies -</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>1 / 2</b>
Elective path/specialty <b>-</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>First-cycle studies</b>	Form of study (full-time, part-time) <b>full-time</b>	
No. of hours Lecture: <b>30</b> Classes: <b>-</b> Laboratory: <b>15</b> Project/seminars: <b>-</b>		No. of credits <b>4</b>
Status of the course in the study program (Basic, major, other) <b>(brak)</b>		(university-wide, from another field) <b>(brak)</b>
Education areas and fields of science and art		ECTS distribution (number and %)
<b>Responsible for subject / lecturer:</b> dr hab. inż Jarosław Jakubowicz, prof. nadzw. email: jaroslaw.jakubowicz@put.poznan.pl tel. 616653781 Wydział Budowy Maszyn i Zarządzania ul. Piotrowo 3, 60-965 Poznań		<b>Responsible for subject / lecturer:</b> Maciej Tuliński email: maciej.tulinski@put.poznan.pl tel. 061 665 3628 Wydział Budowy Maszyn i Zarządzania ul. Piotrowo 3, 60-965 Poznań
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Basic knowledge of physics and mathematics (program basis for high school level)
2	<b>Skills</b>	Ability to solve basic problems of physics on the basis of existing knowledge, the ability to obtain information from identified sources
3	<b>Social competencies</b>	Understanding the need to broaden the competence, willingness to work together as a team
<b>Assumptions and objectives of the course:</b>		
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		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
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]		
<b>Skills:</b>		
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]		
<b>Social competencies:</b>		
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 - [K1A_K02]		

<b>Assessment methods of study outcomes</b>		
<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>		
<b>Course description</b>		
<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>		
<p><b>Basic bibliography:</b></p> <ol style="list-style-type: none"> <li>Leszek. A. Dobrzański, ?Podstawy nauki o materiałach?, Wydawnictwo Naukowo-Techniczne</li> <li>Leszek. A. Dobrzański, ?Metaloznawstwo i obróbka cieplna? Wydawnictwo Naukowo-Techniczne</li> <li>Karol Przybyłowicz, Janusz Przybyłowicz, ?Materiałoznawstwo w pytaniach i odpowiedziach? , Wydawnictwo Naukowo-Techniczne</li> <li>Skrypt: ?Materiały do ćwiczeń laboratoryjnych z metaloznawstwa? Wydawnictwo Politechniki Poznańskiej</li> </ol>		
<p><b>Additional bibliography:</b></p> <ol style="list-style-type: none"> <li>Michael Ashby i in.: ?Inżynieria materiałowa? tom I i II, Wydawnictwo Galaktyka</li> <li>Poradnik Inżyniera: ?Obróbka cieplna metali?, Wydawnictwo Naukowo-Techniczne</li> </ol>		
<b>Result of average student's workload</b>		
Activity	Time (working hours)	
1. Participation in classes	30	
2. Participation in laboratory	15	
3. Consultations	10	
4. Preparation for laboratory	20	
5. Preparation for the exam	20	
6. Exam	5	
<b>Student's workload</b>		
Source of workload	hours	ECTS
Total workload	100	4
Contact hours	60	2
Practical activities	15	1