



## Subject card

Subject name and code	Materials Technology , PG_00039870						
Field of study	Mechanical Engineering, Mechanical Engineering						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2020/2021		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study Subject group related to scientific research in the field of study		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Materials Engineering and Bonding -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Michał Landowski					
	Teachers	mgr inż. Adrian Wolski dr inż. Jacek Haras mgr inż. Anna Janeczek dr inż. Michał Landowski					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	E-learning hours included: 0.0						
	Adresy na platformie eNauczanie: Technologia materiałów - W/L, MiBM, sem. 2, PG_00039870 - Moodle ID: 13635 <a href="https://enauzanie.pg.edu.pl/moodle/course/view.php?id=13635">https://enauzanie.pg.edu.pl/moodle/course/view.php?id=13635</a>						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM		
	Number of study hours	30	5.0	40.0	75		
Subject objectives	Student gains the knowledge of basic technologies of getting metal alloys, creating casts and components worked plastically. Produces casting forms. Carries out practically rolling, pressing, cutting and drawing. Gets know how to examine metal features.						
Learning outcomes	Course outcome	Subject outcome	Method of verification				
	[K6_W03] possesses and is able to practically apply the knowledge on the construction, properties and testing methods of construction materials	Learns methods of testing the properties of metal materials. The student learns the methods of shaping elements by casting and forming.	[SW1] Assessment of factual knowledge				
	[K6_U10] is able to formulate the principles of selecting a material for a construction, ensuring the correct operation of a device	The student knows the basic groups of engineering materials. Is able to determine the influence of manufacturing techniques on the properties of materials.	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject				

Subject contents	<p>Metallurgy of metals and its alloys. Metallurgy of pig iron. Steelmaking. Smelting of the steel in the electric furnaces. Metallurgy of the cast iron. Methods of casting. Manual and machine-made sand casting. Moulding materials. Automatization and mechanization of forming and creating the core. Special methods of making forms of the core. Special methods of casting. Bases of the plastic working. Plastic strain of metals. The influence of the plastic strain in the metal features. Classification of plastic working processes. Rolling of metals. Construction and classification of the rolling mills. Rolling stock. Heating of the stock. Rolling of the billets and blooms. Rolling of the sections. Rolling of the tubes. Forging and pressing. Machines for forging and pressing. Flat die forging. Die/drop forging. Classifications of the forgings. Drawing and extrusion. Characteristic of the drawing and extrusion processes. Drawbenches. Extruding press. Bar, Wire and tube drawing technology. Extrusion processes technology. Stamping of coats and classification of its processes. Shearing of metals. Bending of metals. Progressive pressing and compound die. Casting and plastic working processes and its influence on the natural environment. LABORATORY PRACTICAL TRAINING. Preparing of casting processes. Execution of forms by using sectional and not-sectional models. Machines for plastic working. The influence of the plastic strain in the metal features. Rolling. Plastic bending of profiles and tubes. Stamping of coats.</p>											
Prerequisites and co-requisites	Not required											
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="453 732 794 763">Subject passing criteria</th> <th data-bbox="799 732 1141 763">Passing threshold</th> <th data-bbox="1145 732 1482 763">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="453 770 794 801"></td> <td data-bbox="799 770 1141 801">50.0%</td> <td data-bbox="1145 770 1482 801">50.0%</td> </tr> <tr> <td data-bbox="453 808 794 840"></td> <td data-bbox="799 808 1141 840">50.0%</td> <td data-bbox="1145 808 1482 840">50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade		50.0%	50.0%		50.0%	50.0%
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Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>1. Poradnik inżyniera: Odlewnictwo. WNT. Warszawa 1974</li> <li>2. Murza - Mucha K.: Techniki wytwarzania. Odlewnictwo. PWN Warszawa 1978</li> <li>3. Dobrucki W.: Zarys obróbki plastycznej metali. Śląsk 1992</li> <li>4. Skoblik R., Wilczewski L.: Technologia Metali. Laboratorium. 2006r. <a href="http://www.wbss.pg.gda.pl">www.wbss.pg.gda.pl</a></li> </ol>										
	Supplementary literature	<ol style="list-style-type: none"> <li>1. Erbel S., Kuczyński K., Marciniak Z.: Obróbka plastyczna. Warszawa. PWN 1986</li> <li>2. Romanowski W.P.: Poradnik obróbki plastycznej na zimno. Warszawa: WNT 1976</li> <li>3. Szwecyca M., Nadolska D.: Metalurgia i odlewnictwo. Poznań: Wyd. Polité. Pozn. 2002</li> </ol>										
	eResources addresses	Technologia materiałów - W/L, MiBM, sem. 2, PG_00039870 - Moodle ID: 13635 <a href="https://enauczenie.pg.edu.pl/moodle/course/view.php?id=13635">https://enauczenie.pg.edu.pl/moodle/course/view.php?id=13635</a>										
Example issues/ example questions/ tasks being completed	<p>Metallurgy of metals and its alloys. Manual and machine-made sand casting. Bases of the plastic working. Plastic strain of metals. The influence of the plastic strain in the metal features.</p>											
Work placement	Not applicable											