GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Materials Processing, PG_00039821		
Field of study	Materials Engineering, Materials Engineering, Materials Engineering, Materials Engineering		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2022/2023
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	3	Language of instruction	Polish
Semester of study	6	ECTS credits	4.0
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	dr inż. Tomasz Seramak 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	30.0	0.0	15.0	0.0	0.0	45
	E-learning hours included: 0.0						

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	45	5.0	50.0	100

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_K01	The student learns the complexity of technological processes during the production of machine elements. The student knows the basics of designing technological processes and the directions of development of these techniques.	[SK4] Assessment of communication skills, including language correctness [SK5] Assessment of ability to solve problems that arise in practice
K6_U01	The student learns the methods of determining material defects recurring during the casting process. The student is able to determine the influence of forming processes on the mechanical properties of steel.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU5] Assessment of ability to present the results of task
K6_U03	The student is able to connect the manufacturing technique with favorable structural aspects in the processes of forming, powder metallurgy and foundry.	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject
K6_W05	The student uses the basics of technical drawing to design a mold. The student determines the basic strength properties on the basis of raw results from testing machines.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects

Subject contents	Lecture: Metallurgy of metals and its alloys. Methods of manufacturing of castings. Principles of plastic working of metals. Rolling of metals. Forging and pressing. Pulling and extrusion forming. Stamping. Definition of a powder metallurgy. The basic area of application. Aadvantages and disadvantages of the method. The basic stages of the process; method of powder fabrication; basic properties of the powder; methods of shaping and sintering; additional processes. The examples of products. Laboratory: 1. Preparing of production of castings 2. Preparing of moulds with split and unsplit pat tern. 3. Machines for plastic working of metals. 4. Effect of cold work on mechanical properties of metals. 5. Rolling. 6. Bending. 7. Stamping. Examination of same properties of the powders; analyze of the producing methods on the powder properties; analyze of the pressing parameters on the product properties. Some products analyze.	
Prerequisites and co-requisites	Knowledge of classification of metals and methods of testing of its properties.	
Assessment methods and criteria		

Subject passing criteria	Passing threshold	Percentage of the final grade
Practical exercise	50.0%	50.0%
Midterm colloquium	50.0%	50.0%

Recommended reading	Basic literature	1. Poradnik inżyniera: Odlewnictwo. WNT. Warszawa 1974 2. J. Nowacki; Spiekane metale i kompozyty z osnową metaliczną; WNT Warszawa, 2005. 3. Dobrucki W.: Zarys obróbki plastycznej metali. Śląsk 1992 4. Skoblik R., Wilczewski L.: Technologia Metali. Laboratorium. 2006r. www.wbss.pg.gda.pl 5. J. Nowacki; Spiekane metale i kompozyty z osnową metaliczną; WNT Warszawa, 2005.
	Supplementary literature	1. J. Lis, R. Pampuch; Spiekanie; Kraków: AGH Uczelniane Wydawnictwa Naukowo-Dydaktyczne, 2000. 2. Murza - Mucha K.: Techniki wytwarzania. Odlewnictwo. PWN Warszawa 1978 3. L.A. Dobrzański; Metaloznawstwo z podstawami nauki o materiałach, WNT Warszawa 1996.
	eResources addresses	Adresy na platformie eNauczanie: Technologie materiałowe, L, IM, Ist, sem. 06, letni 22/23 (PG_00039821) - Moodle ID: 29798 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=29798 Technologie materiałowe, L, IM, Ist, sem. 06, letni 22/23 (PG_00039821) - Moodle ID: 29798 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=29798
Example issues/ example questions/ tasks being completed	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.	
Work placement	Not applicable	