



## Subject card

Subject name and code	Casting and plastic working, PG_00039962						
Field of study	Management and Production Engineering, Management and Production 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	5	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	dr inż. Jacek Haras 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						
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_W06	The student has knowledge of the operation of machines and devices.			[SW1] Assessment of factual knowledge		
	K6_K01	The student learns the basic and advanced techniques of manufacturing metal elements. The student learns the possibilities and limitations of manufacturing techniques.			[SK5] Assessment of ability to solve problems that arise in practice		
	K6_U02	The student obtains the necessary information from databases of scientific articles and engineering guides.			[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information		
Subject contents	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.						

Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		56.0%	50.0%
		56.0%	50.0%
Recommended reading	Basic literature	<p>1. Poradnik inżyniera: Odlewnictwo. WNT. Warszawa 1974</p> <p>2. Murza - Mucha K.: Techniki wytwarzania. Odlewnictwo. PWN Warszawa 1978</p> <p>3. Dobrucki W.: Zarys obróbki plastycznej metali. Śląsk 1992</p> <p>4. Skoblik R., Wilczewski L.: Technologia Metali. Laboratorium. 2006r. <a href="http://www.wbss.pg.gda.pl">www.wbss.pg.gda.pl</a></p>	
	Supplementary literature	<p>1. Erbel S., Kuczyński K., Marciniak Z.: Obróbka plastyczna .Warszawa. PWN 1986 2. Romanowski W.P.: Poradnik obróbki plastycznej na zimno. Warszawa: WNT 1976 3. Szweyger M., Nadolska D.: Metalurgia i odlewnictwo. Poznań: Wyd. Polít. Pozn. 2002 Metody nauczania</p>	
	eResources addresses	<p>Adresy na platformie eNauczanie:  Odlewnictwo i przeróbka plastyczna, W,L ZIP, sem 5, zima 22/23(PG_00039962) - Moodle ID: 27079  <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=27079">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=27079</a></p>	
Example issues/ example questions/ tasks being completed	<p>Metallurgy of metals and its alloys.</p> <p>Manual and machine-made sand casting.</p> <p>Bases of the plastic working.</p> <p>Plastic strain of metals.</p> <p>The influence of the plastic strain in the metal features.</p>		
Work placement	Not applicable		