

## 於。GDAŃSK UNIVERSITY 奶 OF TECHNOLOGY

## Subject card

Subject name and code	Technics of material manufacturing, PG_00055749								
Field of study	Mechanical and Medi	cal Engineerin	g						
Date of commencement of studies	October 2023		Academic year of realisation of subject			2024/	2024/2025		
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	at the university		
Year of study	2		Language of instruction			Polish	Polish		
Semester of study	3		ECTS cred	ECTS credits					
Learning profile	general academic pro	ofile	Assessmer	nt form	exam	exam			
Conducting unit	Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology								
Name and surname	Subject supervisor		dr inż. Aleksa	ńska					
of lecturer (lecturers)	Teachers								
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
	Number of study hours	30.0	0.0	30.0	0.0		0.0	60	
	E-learning hours included: 0.0								
Learning activity and number of study hours	Learning activity Participation ir classes includ plan				Self-study SU		SUM		
	Number of study hours	60	4.0		61.0		125		
Subject objectives	The aim of the course is to obtain basic knowledge of metal welding, casting and metal forming.						ng.		
Learning outcomes	Course outcome		Subject outcome			Method of verification			
	[K6_W06] he/she has basic knowledge in the fields of automatics and mechanical system robotics or electrical engineering and electronics		Student knows automatic and robotic welding and forming processes. Recognizes their advantages and areas of application.			[SW1] Assessment of factual knowledge			
	[K6_W10] he/she has knowledge in the field of machine part manufacturing and metrology		Describes the metallurgical processes of ferrous and non- ferrous alloys. Presents the casting process. Classifies and recognizes plastic forming processes. Defines the processes of joining metals. Distinguishes between methods of welding and cutting metals.			[SW1] Assessment of factual knowledge			
	[K6_U04] he/she is able to use basic medical apparatus and methods to assess measurement errors		Can assess the correctness of conducted measurements and their usefulness.			[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools			

Object contents         Entropy           Medalurgy of molate and their altops Pig ion modalurgy. Stell metalurgy. Causing manufacturing methods. Medalurgy of molate and chain by hand and mechine. Moting sands. Autonating methods and cores. Special casing methods. Second and control of plants overing processes. Media ching. Rolling of blants and sites. Rolling of allows on the properties of media. Classification of plants overing processes. Media ching. Rolling of blants and sites. Rolling of allows on the properties of media. Classification of programs. Classification of pressing processes. Media ching. Media bending. Media plants and sites. Classification. Control of programs. Classification of pressing processes. Media ching. Media bending. Media plants and sites. Commandes for welding. Second the development of welding thermal processes. Neeling thermal cryde. Phase transformations in the weld and in the heat affected zone. Definition of welding. Media welding. Media welding. Media welding bits core writes. Plants and the development of welding. Media Second the development of welding. Second the development of welding technology. Case welding. Laser beam and relations welding. Media Welding, plants acting. Laser beam antiting. Welding deformations and methods of their relation. Control of welde plants. Second the development of a welding. GMAW and GTAW welding, plants acting. Laser beam antiting. Welding deformations and methods of onthe develop of post- and gipes. Pressing of non-unfolding coating.           Preparation of the production of centings. Making forms using the split and non-split model. Plants vorting methods and welding with covered electrodes, automatic submerged arc welding. GMAW and GTAW welding. Resistance welding. Second the development of a welded jorit. Imperiations of welded jorits. Second the development of the split science of the final grade Sonot tests at alboinatories development. Second tests de	Subject contents	LECTURE:						
Manufacturing of asian deatangs by hand and machine. Molding sands. Automation and memory counting and producing cores. Special interview of Balling Automation and the product of pasts or consign, Pinate caterination of medias. The influence of Balling Automation and the product of pasts or consign, Pinate caterination of medias. The influence of Balling Automation and mechanism of the pasts of the product of the pinate caterination of medias. The influence of Balling Automation processes. Present of the present automation presents and the present automation and mechanism of the present automation and methods of the interview of the the Pinate affected 2010.           Classification of Welding processes. Outline of welding thermal processes. Welding thermal cycle. Phase transformation in the weld and in the best affected 2010.         Present acting. Basiling and the welding thermal processes. Welding thermal cycle. Phase transformation in the weld and the the best affected 2010.           Classification of welding processes. Outline of welding thermal processes. Welding thermal cycle. Phase transformation and methods for their reduction. Control of welded prints. Cell-nition of welding the preduction of castings. Making forms using the split and non-split model. Plastic working machines. Influence of cushing on the mechanical properties of metals. Rolling. Plastic bending of profiles and correquisities           Addition provide and provide and correct and properties of metals. Rolling. Plastic bending of profiles and correquisities         Adving and the correct and properties of metals. Rolling. Plastic bending of profiles and correquisities           Advince the welding method. So the metals of the metals of the metal. Work	Subject contents							
Iteratorizations in the weld and in the heat affected zone. Definition of weldability, Basic materials and consumables for welding. Shick welding, Shick and Shick		Manufacturing of sand castings by hand and machine. Molding sands. Automation and mechanization of forming and producing cores. Special methods of making molds and cores. Special casting methods. Basics of plastic working. Plastic deformation of metals. The influence of plastic deformation on the properties of metals. Classification of plastic working processes. Metal rolling. Rolling of billets and slabs. Rolling of sections. Rolling of pipes. Forging and ironing. Forging and pressing machines. Open-die forging. Die forging. Classification of forgings. Characteristics of drawing and extrusion processes. Pressing of non-unfolding coatings. Classification of pressing processes. Metal cutting. Metal bending. Multiple and						
Preparation of the production of castings. Making forms using the spitt and non-spitt model. Plastic working and pipes. Pressing of non-unfolding coatings.           Manual welding with covered electrodes, automatic submerged arc welding. GMAW and GTAW welding. Resistance welding. Gas welding and cutting. Construction of a welded pimt. Imperfections of welded pimts.           Prerequisites and correquisites and correqui		transformations in the weld and in the heat affected zone. Definition of weldability. Basic materials and consumables for welding. Basics of the development of welding technology. Gas welding. MMA welding. Submerged arc welding. TIG welding. Shielding gases. Gas-shielded welding with the MIG/MAG method. Welding with flux cored wires. Pulsed arc welding. Laser, plasma and electron welding. Electric resistance welding. Basic process parameters. Other welding methods. Thermal cutting methods: oxygen cutting, plasma cutting. Laser beam cutting. Welding deformations and stresses and methods of their reduction.						
machines. Influence of crushing on the mechanical properties of metals. Rolling. Plastic bending of profiles and pipes. Pressing of non-unfolding coatings.         Manual welding with covered electrodes, automatic submerged arc welding. GMAW and GTAW welding. Resistance welding. Gas welding and cutting. Construction of a welded joint. Imperfections of welded joints.         Prerequisites       Basic knowledge of physics, chemistry, materials science, electrical engineering and mechanics.         Assessment methods       Subject passing criteria       Passing threshold       Percentage of the final grade         Short tests at laboratories       56.0%       20.0%       Einal test       56.0%       80.0%         Recommended reading       Basic literature       1. Klimpel A.: Technologia spawania i clęcia metali. WNT. Warszawa 1998.       2. Walczak W. (red.): Spawalnictwo. Ćwiczenia laboratoryjne. Wydawnictwo Politechniki Gdańskiej. Gdańsk, 2000.         3. Butnicki S: Spawalnicky. Cwiczenia laboratory ine.       Wydawnictwo Sląsk, Katowice 1996.       3. Butnicki S: Spawanie i napawanie elektryczne metali. Wydawnictwo WNT. Warszawa 1991.         4. Pilarczyk J., Pilarczyk J.: Spawanie i napawanie elektryczne metali.       Syngelementary literature       1. Poradnik inzyniera - Spawalnictwo. WNT Warszawa 2003.       2. Dobrucki W.: Zarys obrokki plastycznej metali. Laboratorium. 2006. www.wbss.pg.gda.pl         8. Supplementary literature       1. Poradnik inzyniera - Spawalnictwo. WNT Warszawa 2003.       2. Dobrucki W.: Zarys obrokki plastycznej metali. Wyd. Sląsk 1992.         ereso		LABORATORY:						
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		Not applicable						