



Subject card

Subject name and code	Typification of steel products, PG_00055259						
Field of study	Management and Production Engineering						
Date of commencement of studies	October 2021		Academic year of realisation of subject		2023/2024		
Education level	first-cycle studies		Subject group		Optional subject group 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		3.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Jerzy Łabanowski				
	Teachers		prof. dr hab. inż. Jerzy Łabanowski dr inż. Jacek Haras				
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		4.0		26.0	75
Subject objectives	To familiarize students with the principles of standardization and classification of metallurgical products included in industry standards and technical regulations.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U02] has the ability of self-learning and expanding knowledge in a specialized field of engineering production		Can independently acquire knowledge in the field of production engineering		[SU1] Assessment of task fulfilment		
	[K6_W02] has knowledge of materials, their properties and research methods, including construction materials used in the machinery industry, has ordered, theoretically founded knowledge of mechanics including modeling of mechanical systems in the field of statics, kinematics and dynamics, and has an ordered, theoretically founded knowledge in the field of strength analysis materials and products		Has knowledge of the classification of construction materials and the standardization of metallurgical products used in the engineering industry		[SW1] Assessment of factual knowledge		
	[K6_K01] feels the need for self-realization by learning throughout life, is looking for modern and innovative solutions in their actions, is able to think creatively and act in an entrepreneurial way		Is aware of the need to constantly replenish professional knowledge		[SK5] Assessment of ability to solve problems that arise in practice		

Subject contents	LECTURE Classification of steel, cast steel, cast iron, non-ferrous metals and their alloys, division into classes and categories. Rules for marking grades of ferrous and non-ferrous metal alloys according to Polish and European standards, ISO and American AISI, UNS. Semi-finished and metallurgical products - terminology, forms and classification states, stamping, packing, transport. Steel products and metallurgical products of non-ferrous metals - rolled products, forgings, drawn and extruded products, castings, metal powders and sintered products metal powders. Unification and standardization of marking of steel products. Review of groups and requirements for metal materials used in various branches of the economy: materials for the energy sector conventional and nuclear, materials for marine structures, materials for the automotive industry and aviation, materials for the chemical and petrochemical industries, materials for construction. Recipes specifying acceptance requirements for steel products (standards, regulations of Ship Companies Classification regulations, UDT regulations). Principles of selecting substitutes for steel and non-ferrous metal alloys. LABORATORY: Practical use of regulations and standards specifying requirements for products metallurgical. Determining the acceptance requirements for rolled, forged, drawn, and steel products steel castings. Setting criteria and selecting materials for specific industrial applications automotive, aviation, petrochemical, shipbuilding in nuclear and conventional energy and construction. Selection of substitutes for steel, cast steel and cast iron according to Polish and foreign standards - exercise in using a computer database. .		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Lecture	50.0%	60.0%
	Laboratory	50.0%	40.0%
Recommended reading	Basic literature	1. Blicharski M.: Inżynieria materiałowa. Stal. WNT Warszawa, 2004 2. Dobrzański L.: Podstawy nauki o materiałach i metaloznawstwo. WNT, Warszawa 2002. 3. Łabanowski J.: Ocena jakości wyrobów hutniczych. Wyd. PWSZ w Elblągu, Elbląg 2012 4. Adamczyk J.: Inżynieria materiałów metalowych, cz I i II. Wyd. Politechniki Śląskiej, Gliwice 2004.	
	Supplementary literature	1. Dobrzański L.A.: Materiały inżynierskie i projektowanie materiałowe. WNT, Warszawa, 2005. 2. Standards; PN, PN-EN, ISO, ASTM, przepisy UDT. 3. Ship Classification Society rules: PRS, DNV, LR, GL.	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	What is the form and qualification condition of a steel product? General classification of non-ferrous metals and their alloys Provide a scheme for classifying steel into groups, What is the basic division of steel according to the current standards What are the strength categories and ductility varieties of weldable structural steels? Classification of stainless steels due to their structure, Principles of marking steel for heavy plates for shipbuilding Explain the given metallurgical terms: What types of marks are used in the guild hallmarking of steel products? What normative documents may regulate the receipt of metallurgical products or semi-finished products? Explain the given designations of steels and non-ferrous alloys		
Work placement	Not applicable		