GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Methods of diagnostics and certification of products, PG_00064723						
Field of study	Management and Production Engineering						
Date of commencement of studies	February 2025		Academic year of realisation of subject	2025/2026			
Education level	second-cycle studies		Subject group	Specialty 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	1		Language of instruction	Polish			
Semester of study	2		ECTS credits	3.0			
Learning profile	general academic profile		Assessment form	assessment			
Conducting unit	Zakład Technologii Materiałów Konstrukcyjnych i Spajania -> Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Jacek Tomków				
	Teachers						
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		10.0		35.0	75
Subject objectives	Familiarizing students with the certification system of metallurgical products and the principles of diagnostics of welded structures e.g. using non-detructiv tests..						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W11] interprets social, economic, legal (including industrial and intellectual property laws), and other non-technical aspects of engineering activities, and includes them into engineering practice	Student potrafi znaleźć informacje dotyczące certyfikacji wyrobów oraz diagnostyki konstrukcji spawanych w dokumentach normatywnych, przepisach oraz zasobach internetowych 171 / 5 000 Student is able to find information concerning product certification and diagnostics of welded structures in normative documents, regulations and online resources	[SW3] Assessment of knowledge contained in written work and projects
[K7_W02] demonstrates structured and theoretically based knowledge covering key issues in the field of Management and Production Engineering allowing for modeling and analysis of stationary and non-stationary production processes and systems, devices and technological processes with continuous and discrete operation	Student knows the basic groups of metal materials and metallurgical products. He has a knowledge base concerning the operation of welded structures	[SW1] Assessment of factual knowledge
[K7_K71] is able to explain the need to apply knowledge from humanistic, social, economic or legal sciences in order to function in a social environment	Student proposes diagnostic methods of welded structures in terms of safe operation, savings and environmental protection	[SK5] Assessment of ability to solve problems that arise in practice
[K7_U02] formulates and tests hypotheses related to problems occurring in stationary and non-stationary systems as well as in production and technological processes combined with simple research problems	Student is able to anticipate problems occurring in products and is able to counteract them.	[SU2] Assessment of ability to analyse information

Subject contents

Accreditation and certification systems for confirming compliance of: tests, quality systems, products, according to European standards EN 450011 series and international standards ISO/IEC 17021. Purposes of certification. Models of certification systems. Procedures and principles of product certification. Certification mode. Product testing. Entities of the certification system. Accreditation of conformity assessment bodies. Semi-finished products and metallurgical products - terminology, forms and classification states, marking, packaging, transport Conformity assessment of metallurgical products. Model of quality assurance in control and final testing of steel products. Types of control documents. Certification of metallurgical products: technical conditions of delivery of wrought products made of steel and non-ferrous metal alloys, technical conditions of delivery of material for forging and forgings, technical conditions of delivery of ingots and castings. Acceptance tests of metallurgical products and semi-finished products. Assessment of the quality of metallurgical products. Office of Technical Inspection - certification of pressure and crane installations. Diagnostics of pressure installations. Threat analysis and risk assessment: Initial Threat Analysis, Threat and Operational Capabilities Analysis, Failure Type and Consequence Analysis, RBI (Risk Based Inspection) Inspection Planning Based on Risk Analysis. Lab: Certification of product conformity. Pressure tanks and equipment, gas cylinders. Pipelines and elements of pipelines. Auxiliary materials for welding. Planning inspections based on risk analysis (RBI) for the selected pressure installation. Non-destructive testing methods. Method of selecting non-destructive testing for various technological objects.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
	50.0%	60.0%
	100.0%	40.0%

Recommended reading

Basic literature	1. Knosala R. Inżynieria produkcji. Kompendium wiedzy. PWE, 2017 2. Urząd Dozoru Technicznego - przepisy. 3. Łabanowski J., Ocena jakości wyrobów hutniczych. Wyd. Państwowej Wyższej Szkoły Zawodowej w Elblągu, Elbląg 2008.
Supplementary literature	1. Norma PN-EN ISO/IEC 17067:2014-01. Ocena zgodności - Podstawy certyfikacji wyrobów oraz wytyczne dotyczące programów certyfikacji wyrobów. 2. Norma PN-EN ISO/IEC 17065:2013-03. Ocena zgodności - Wymagania dla jedno-stek certyfikujących wyroby, procesy i usługi.
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	Form and qualifying state of a metallurgical product, list examples of states and classification forms of steel, What documents do you know about the inspection of metallurgical products or semi-finished products? The role and tasks of the controller in the quality control of steel products What is the acceptance inspection of metallurgical products or semi-finished products. What types of inspection tests would you use to assess the quality of bar or plate for shipbuilding? List the product accreditation and certification systems Certification objectives. Models of certification systems. Procedures and principles of product certification. Models of quality assurance in control and final testing of steel products Principles of diagnostics of pressure installations List methods of hazard analysis and risk assessment List and describe non-destructive testing methods Select a non-destructive testing method for quality assessment....
Work placement	Not applicable

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