



Subject card

Subject name and code	Destructive and non-destructive tests of materials, PG_00055258						
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		4.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Jacek Haras				
	Teachers		dr inż. Jacek Haras dr inż. Krzysztof Krzysztofowicz dr inż. Artur Sitko				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	15.0	15.0	0.0	60
	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	60		4.0		36.0	100
Subject objectives	The aim of the course is to familiarize students with the issues related to destructive and non-destructive testing of metals.						

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	Distinguishes between learning methods, is able to independently search for information.	[SU1] Assessment of task fulfilment
	[K6_W08] has basic management knowledge, including process and product quality management, and detailed knowledge of integrated and standardized quality, environmental, health and safety management systems	Distinguishes between research methods. Knows the principle of implementation, the conditions for carrying out and the application of basic methods of material testing.	[SW1] Assessment of factual knowledge
	[K6_U04] is able to develop documentation in the area of preparation, implementation and control of production processes in Polish and in a foreign language considered basic for scientific fields, is able to identify and formulate the basic objectives of quality management in the product life cycle, is able to use information and communication techniques appropriate to the implementation of tasks typical in engineering activities including preparation, production and supervision of the manufacturing process	Student can prepare a test report, read data from standards and approvals and use them to prepare technological documentation.	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information
	[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	Student understands the challenges related to the development of modern methods of metal testing and is able to independently search for solutions to technological problems.	[SK5] Assessment of ability to solve problems that arise in practice
Subject contents	Destructive testing of materials: static tensile test, bend test, impact test, hardness measurements, metallographic tests, fatigue test, fracture mechanics, corrosion tests, creep test, fracture test and others. Non-destructive testing of materials: visual, penetration, magnetic, radiographic, ultrasonic and other testing.		
Prerequisites and co-requisites	Basic knowledge of materials science, mechanics, welding technology, plastic working of materials.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Mark from laboratory	56.0%	20.0%
	Completed project	56.0%	10.0%
	Final test	56.0%	70.0%

Recommended reading	Basic literature	<p>[1] Bachmacz W.: Wytrzymałość materiałów. Badania doświadczalne. Skrypt Politechniki Częstochowskiej, Częstochowa 1973.</p> <p>[2] Banasik M.: Ćwiczenia laboratoryjne z wytrzymałości materiałów. PWN, Warszawa 1977.</p> <p>[3] Boruszak A., Sykulski R., Wrześniowski K.: Wytrzymałość materiałów. Doświadczalne metody badań. Wydawnictwo Politechniki Poznańskiej, Poznań 1977.</p> <p>[4] Dyląg Z., Orłóś Z.: Wytrzymałość zmęczeniowa materiałów. Warszawa. WNT 1962.</p> <p>[5] Jastrzębski P., Mutermilch J., Orłóś W.: Wytrzymałość materiałów. Warszawa. Arkady 1985.</p> <p>[6] Katarzyński S., Kocańda S., Zakrzewski M.: Badania właściwości mechanicznych metali. WNT, Warszawa 1967.</p> <p>[7] Łączkowski R.: Wytrzymałość materiałów. Gdańsk. WPG 1988.</p> <p>[8] Mazurkiewicz S.: Laboratorium z wytrzymałości materiałów. Wydawnictwo Politechniki Krakowskiej, Kraków 1978.</p> <p>[9] Niezgodziński M.E., Niezgodziński T.: Wzory wykresy i tablice wytrzymałościowe. Warszawa. WNT 1996.</p> <p>[10] Orłóś Z.: Doświadczalna analiza odkształceń i naprężeń. PWN, Warszawa 1977.</p> <p>[11] Walczyk Z.: Wytrzymałość materiałów. Gdańsk. WPG 1998.</p>
	Supplementary literature	PKN standards
	eResources addresses	Adresy na platformie eNauczanie:
	Example issues/ example questions/ tasks being completed	Describe the research method. Indicate the limitations of the material testing method. Indicate the application of the material testing method.
Work placement	Not applicable	