GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00056978		
Field of study	Civil Engineering		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2023/2024
Education level	first-cycle studies	Subject group	
Mode of study	Part-time studies	Mode of delivery	at the university
Year of study	4	Language of instruction	Polish
Semester of study	8	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Engineering Structures -> Faculty of Civil and Environmental Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Dariusz Kowalski	
	Teachers	dr inż. Dariusz Kowalski	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	20.0	20.0	0.0	0.0	0.0	40

E-learning hours included: 0.0

Additional information:
Lectures in stationary form

Exercise in the form of stationary laboratory classes in a dedicated laboratory

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	40	0.0	0.0	40

Subject objectives

The aim of the course is to acquaint students with the methods of inspection and evaluation of metal structures under applicable acceptance standards. In class, students learn methods and techniques to identify flaws and inconsistencies in the welded joints. Methods for evaluating the correctness of the screw connections. Students will be familiarized with the rules for the implementation of technical descriptions and specifications for the construction of metal

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W16] Has deeper and adequate knowlege of civil engineering, within offered specialization	Student acquainted with the commonly used methods of nondestructive testing of metallic structures,	[SW1] Assessment of factual knowledge
[K6_U17] has specialized skills in civil engineering within offered specialization	The student knows how to use measuring and research tools, knows their applications, working methods, limitations that affect the test result and assessment	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject
[K6_K05] can work on his own and in a team to solve a problem	The student knows the principles of division of tasks and responsibilities at the stage of design, manufacture, control and operation of the structure; knows how to assign tasks to individual stages; knows the relationships and responsibilities	[SK1] Assessment of group work skills [SK3] Assessment of ability to organize work

Subject contents	Program content lecture classes: Organizational meeting, getting to know the content object, the terms of credit. Quality requirements, assembly, research NDT, etc. included in the building project. The welding process as a source of . Classification of non-compliance of welded joints of metal structures. Acquainted with the testing methods: VT - Visual Testing of welded joints; PT - Penetrant testing of welds; MT - Magnetic studies of welded joints; RT - Radiographic examination of welded joints; UT - Ultrasonic testing of welded joints; UT - Ultrasonic testing of welded joints. Other techniques for testing and inspection of metal structures. Legal requirements relating to the technical description of the project and the technical specifications. Technical Description and technical specifications for the design of steel structure, the necessary studies. Regulations and standards for the reception of metal. Condition technical performance and acceptance of metal structures. Quality assurance systems in the construction of metal structures. Plans Audit and Research for the objects implemented in the technology of metal structures. Examination lecture / lab - final test. Program content of the laboratory: Introduction - the purpose of teaching the subject. Terms pass the course. The organization of the laboratory. The division into groups laboratory. Metrology - measurements of geometric features elements using various gauges. Visual Testing VT - Determination of dimensions of welded joints (Fillet Gauge , protractor). Visual Testing VT - Discrepancies welded joints. PT penetrant testing, magnetic studies MT. X-rays RT - slideshow welded joints. Ultrasonic testing UT - thickness measurements using gages. Ultrasonic testing UT - use flaw - patterns. Ultrasonic flaw detector UT- use - artificial defects, discrepancies in real samples of welded joints. Research anticorrosion coatings. Technical description of the design of metal structures. Technical specifications for the design of metal structures. Technical specifications for the design of metal structures. Overview prepared by the students of the technical specifications. Final test.
Prerequisites and co-requisites	Passed first degree course at the Faculty of Civil Engineering Knowledge of the design and production of construction of metal structures Knowledge of the techniques and welding processes used in building engineering
Assessment methods and criteria	

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

Recommended reading	Basic literature	1. Lewinska-Romicka A. Non-destructive testing. Basics defectoscopic. Scientific and Technical Publishing House, Warsaw 2001. 2. Czuchryj J. Stachurski M.: Non-destructive welding testing. Welding Institute, Gliwice 2002 3. PN EN 1090-1/2/3- Execution of steel structures and aluminum structures 1. Requirements for conformity assessment od structiral components / 2. Technical requirements for steel structures / 3. Technical requirements for aluminium structures 4. PN-B-06200: 2002 - Building steel structure. Constructional steelwork specification. Basic Requirements 5. Hlebowicz J.: Visual testing. General principles and application examples. Gamma Office, Warsaw 1997 6. Czuchryj J, Debski E.: Studies of welded joints according to European standards. Gamma Office, Warsaw 2000

	Supplementary literature	1. PN EN 1993 - Design of steel structures (EC3 series of standards) 2. PN-90/B-03200 - Steel structures. Design rules 3. Jezierski G: Industrial Radiography. WNT Warsaw 1993 4. Niedzielski A. Non Destructive Testing. Part I. Gdańsk, Ed. Gdansk University of Technology in 1991 5. The current versions of the legislation on the descriptive part of the construction design and technical specifications. 6. Current standards of conduct and grading structure based on non-destructive testing.
	eResources addresses	Adresy na platformie eNauczanie: Nieniszczące Metody Badań Konstrukcji Metalowych - Moodle ID: 38568 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=38568
Example issues/ example questions/ tasks being completed	Non-destructive testing of metal constructions Quality and safety requirements of metal structures What are the physical phenomena are used in NDT testing methods? As tests are carried out various research methods? What are the tests used to assess the surface of welded joints? What are the tests used to assess the volume of welded joints? Research and evaluation of welds selected non-destructive methods, interpretation of results; interpretation of project requirements; determining regulatory requirements based on standards; preparation of technical specifications metal structure based on performance standards and acceptance.	
Work placement	Not applicable	