GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Design of Welded Structures, PG_00040094		
Field of study	Mechanical 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	Part-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	Department of Materials Engineering and Bonding -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Grzegorz Rogalski	
	Teachers	dr hab. inż. Grzegorz Rogalski	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	22.0	0.0	15.0	0.0	0.0	37

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	37	10.0	53.0	100

Subject objectives

To acquaint students with deepened information on the performance characteristics of the weldment and the formation of welded joints under the influence of static and dynamic loads. The student is able to apply different methods of dimensioning complex structures, working in various environmental conditions. Can also based on an analysis of weldability choose in a systemic way the material for welded structures.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U09] is able to plan the manufacturing, assembly and quality control processes of typical constructions and mechanical devices, estimating their costs	On the basis of the information obtained, the student is able to plan the stages of manufacturing steel structures and estimate the initial production costs.	[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_W08] possesses basic knowledge including the methodology of designing machine parts, mechanical devices, selection of construction materials, manufacturing and operation, with the lifetime cycle	On the basis of the information obtained, the student is able to adapt the existing tools and acquired skills to solve the construction problem	[SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge
[K6_W11] possesses knowledge on design, technology and manufacturing of machine parts, metrology, and quality control; knows and understands methods of measuring and calculating basic values describing the operation of mechanical systems, knows basic calculating methods applied to analyse the results of experiments	The student is able to combine the aspects of construction, technology and quality control in relation to the production of steel structures.	[SW2] Assessment of knowledge contained in presentation

Subject contents

Basic concepts and definitions concerning the strength of materials in relation to the welded joints. Elastic and plastic deformation of the material under external load. Types of breakthroughs. Relations between the state of stress and strain. Effects of temperature and type of load on the behavior of the material. Basic principles for the design of welded structures: the method of calculating the stress equilibrium conditions, geometric conditions, compounds physical stress permissible. Characteristics of types of stress: tensile, shear stress, tension membrane formation conditions of stress concentration, multi-axis stress state. Calculation of complex structural design contains butt and fillet welds

Prerequisites and co-requisites	Basic knowledge of metallurgy, mechanics and strength of materials.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	written exam	50.0%	70.0%
	laboratory	100.0%	30.0%
Recommended reading	Basic literature	1. K. Ferenc, J. Ferenc: Projektowanie konstrukcji spawanych" WNT W-wa 2002 - Design of welded structures - in Polish 2. Poradnik inżyniera - Spawalnictwo - T 1, WNT W-wa 2003/ Welding handbook Part one - in Polish 3. J. Augustyn, E Śledziewski: Technologiczność konstrukcji stalowych Arkady W-wa 1981- Producibility of steel construction - in Polish 4. M. Porębska, A. Skorupa: Połączenia spójnościowe, Wyd. Naukowe PWN W-wa 1997 - Welding design - in Polish	
	Supplementary literature	Technical Journals: 1. Welding Journal 2. Metallurgical Transaction A, B 3. Transaction of ASME	
	eResources addresses	Adresy na platformie eNauczanie: Projektowanie konstrukcji spawanych, W, L, MiBM, Sem.6, niestacjonarne I stopień, Lato 2023/2024 - Moodle ID: 36533 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36533	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		