



## Subject card

Subject name and code	Design of welded constructions, PG_00055243						
Field of study	Management and Production Engineering						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2026/2027		
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	5	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	dr hab. inż. Grzegorz Rogalski					
	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		8.0		37.0	75
Subject objectives	The aim of the course is to familiarize students with the principles of designing welded structures, including the variables that affect the weldability of construction materials, welding stresses and deformations, and how to minimize the adverse effects of the welding process.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[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	The student is able to determine the construction problem and take action to eliminate them			[SK1] Assessment of group work skills [SK5] Assessment of ability to solve problems that arise in practice		
	[K6_W03] has knowledge of the design record (the record structure) for the preparation of the manufacturing process documentation and basic knowledge of the implementation and management of production systems, including the principles of designing machine parts and manufacturing technologies using information techniques	The student is able to design a structure with welded joints, taking into account the existing standards and requires			[SW3] Assessment of knowledge contained in written work and projects		
	[K6_U06] when formulating and solving engineering tasks a student can see aspects of system management and organization of individual and as a team, taking into account the human factor, has necessary preparation for work in an industrial environment, and knows the rules and standards related to occupational health and safety	Based on the obtained information, the student is able to adjust the existing tools and the acquired skills to solve a construction problem			[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject		
[K6_U02] has the ability of self-learning and expanding knowledge in a specialized field of engineering production	The student is able to broaden the knowledge of welded structures on the basis of available information and tools			[SU4] Assessment of ability to use methods and tools			

Subject contents	As part of the course, students learn the factors determining the weldability of construction materials along with their indicators, types of cracks and methods of their prevention, the impact of the thermal welding cycle on the properties of joints as well as welding deformations and stresses, rules for making joints, including calculations, e.g. using the allowable stress method.		
Prerequisites and co-requisites	Basic information on materials science and the basics of machine designe		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory	56.0%	50.0%
	Lecture	56.0%	50.0%
Recommended reading	Basic literature	<p>Chmielewski T.: Projektowanie procesów technologicznych spawalnictwo, Oficyna Wydawnicza Politechniki Warszawskiej, 2013</p> <p>Ferenc J.: Kazimierz Ferenc: Konstrukcje spawane Połączenia, Wydawnictwo Naukowe PWN, WNT, Wydanie 3, 2021</p> <p>Ferenc J.: Kazimierz Ferenc: Spawalnicze gazy osłonowe i palne, WNT, Warszawa, 2013</p> <p>Siwiek B.: Połączenia spawane, zgrzewane, lutowane i klejone, Wydawnictwo Politechniki Gdańskiej, 2002</p> <p>Tasak E.: Metalurgia spawania. Wydawnictwo Jak. Kraków, 2008</p> <p>Normy przedmiotowe</p>	
	Supplementary literature	Not require	
	eResources addresses	Adresy na platformie eNauczanie:	
	Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> <li>1. Explain the influence of the welding process on the formation of welding deformations</li> <li>2. Characterize the welding thermal cycle depending on the welding process and the number of beads</li> <li>3. Give the basic principles of calculating stresses in welded joints with butt and fillet welds</li> <li>4. Explain the reasons for the formation of cold, hot and lamellar cracks</li> <li>5. Explain the influence of the welding sequence on the formation of welding deformations</li> <li>6. Give methods of preventing welding distortions</li> </ol>	
Work placement	Not applicable		