GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Advanced welding processes, PG_00064859		
Field of study	Mechanical Engineering		
Date of commencement of studies	February 2026	Academic year of realisation of subject	2026/2027
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	English
Semester of study	2	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Division of Structural Materials Technology and Welding -> Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Aleksandra Świerczyńska	
	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	15.0	0.0	45

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	45	5.0	25.0	75

Subject objectives

The aim of the course is to familiarize students with advanced welding processes

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_U03] plans and carries out experimental investigations to determine the parameters of devices, processes or systems in the field of Mechanical Engineering and Mechanical Engineering, appropriately selects methods, techniques and tools, interprets results and estimates measurement errors	The student understands the impact of welding methods on the properties of structures.	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject
[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	The student understands the impact of the selected welding technology on non-technical production aspects.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
[K7_W01] explains and describes, on the basis of general knowledge of the scientific disciplines forming the theoretical basis of Mechanics and Mechanical Engineering, the structure and principles of operation of mechanical systems and processes	The student knows the methods of increasing the efficiency of welding processes.	[SW1] Assessment of factual knowledge
[K7_U13] evaluates the feasibility and potential for utilizing new technical and technological achievements in accomplishing tasks characteristic for the field of study	The student is able to search for information on advanced welding methods.	[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools

Subject contents

Basic terms and definitions. Classification of welding processes. Advanced methods of TIG welding. FCAW welding. Gases used in advanced welding methods. Laser welding. Plasma welding. Electron beam welding. Hybrid welding. Solid state welding. Special welding processes

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<tr><td>Prerequisites and co-requisites</td><td colspan="3"></td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>exam</td><td>60.0%</td><td>60.0%</td></tr>
<tr><td>Project</td><td>60.0%</td><td>20.0%</td></tr>
<tr><td>Laboratory tests</td><td>60.0%</td><td>20.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">Norrish, J. (2006). Advanced Welding Processes. Elsevier.</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">Welding metallurgy and weldability of stainless steels / John C. Lippold, Damian J. Kotecki

Metallurgy of welding / J. F. Lancaster.

Principles of welding technology / L. M. Gourd.

Welding, brazing, and soldering / Scott D. Henry [et al.]; prepared under the direction of the ASM International Handbook Committee.

Procedure Handbook of Arc Welding

How To Weld (Motorbooks Workshop) / Todd Bridigum</td></tr>
<tr><td>eResources addresses</td><td colspan="2"></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">Describe the welding process.State the advantages of the welding process.Draw a diagram of the process implementation.</td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
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