

Course code

Course item

## 1. INFORMATION ABOUT THE COURSE

### a. Basic information

Course title	<i>Welding and Joining Technologies</i>
Field of study	<i>Mechanical Engineering</i>
Cycle	<i>First degree</i>
Study profile	<i>General academic</i>
Study mode	<i>Full-time or part-time</i>
Specialization	<i>All</i>
Unit responsible for the field of study	<i>Department of Manufacturing Technologies</i>
Lecturer	<i>Piotr Czyżewski, PhD</i>
Introductory courses	<i>Mathematics, basic physics</i>
Prerequisites	<i>No prerequisites</i>

### b. Semester/ weekly timetable

Semester	Lectures (W)	Classes (C)	Laboratories (L)	Project classes (P)	Seminars (S)	Fieldwork (T)	ECTS credits ECTS*
	15		30				4

**C. Assumed outcomes and aims** - aims bind the course programme with the study programme and are referred to in learning outcomes point 2

## 2. LEARNING OUTCOMES (acc. to National Qualifications Framework)

No.	Description of learning outcomes	Reference to learning outcomes for the field of study	Reference to learning outcomes for the area of study
<b>KNOWLEDGE</b>			
K1	has knowledge related to the process of welding and joining elements made of metal and polymer materials.	K_W04	P6S_WG
K2	has knowledge in the field of designing inseparable connections from metal and polymer materials	K_W07	P6S_WG
<b>Skills</b>			
S1	is able to select methods of permanent joining to engineering materials and verify technological parameters.	K_U04	P6S_UW
S2	can design inseparable connections and verify with research methods.	K_U05	P6S_UW

SOCIAL COMPETENCES			
SC1	is aware of the importance and understands the non-technical aspects and effects of mechanical engineer's activities, including their impact on the environment and the related responsibility for decisions made	K_K04	P6S_KO

### 3. TEACHING METHODS

Multimedia lectures, practice laboratories, virtual systems

### 4. METHODS OF EXAMINATION

Lectures: class attendance and/or test, direction presentation

Laboratories: class attendance and reports

### 1. COURSE CONTENT

Specify the content separately for each type of classes in accordance with point I.B.	<p><i>LECTURES</i></p> <ol style="list-style-type: none"> <li>1. Introduction, Metallurgical Basics</li> <li>2. Fusion Welding and Gas Welding</li> <li>3. Arc Welding I</li> <li>4. Arc Welding II</li> <li>5. Arc Welding III</li> <li>6. Resistance Welding I and Mechanical Joining</li> <li>7. Mechanisation und Automation</li> <li>8. Special Processes I</li> <li>9. Special Processes II and Brazing</li> </ol> <p><i>LABORATORIES</i></p> <ol style="list-style-type: none"> <li>1. Practical aspects of Fusion Welding and Gas Welding</li> <li>2. Practical aspects of Arc Welding I</li> <li>3. Practical aspects of Arc Welding II</li> <li>4. Practical aspects of Arc Welding III</li> <li>5. Resistance Welding I and Mechanical Joining</li> <li>6. Practical aspects of Mechanisation und Automation</li> <li>7. Practical aspects of Special Processes I</li> <li>8. Practical aspects of Special Processes II and Brazing</li> </ol>
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### 1. VALIDATION OF LEARNING OUTCOMES

(Each learning outcome from the list requires validation methods to ensure that it was achieved by a student.)

Learning outcome	Form of assessment (for example:)					
	Oral examination	Written examination	Test	Project	Report	Class attendance
K1-K2			x	x	x	x
S1-S2			x	x	x	x
SC1			x	x	x	x

### 2. LITERATURE

Basic literature	<ol style="list-style-type: none"> <li>1. <i>UNITOR. Marine Welding Handbook.</i></li> <li>2. <i>Materials and Welding Author Germanischer Lloyd Aktiengesellschaft, Hamburg</i></li> </ol>
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	3. <i>Welder Guide Book Author Welding Equipment ESAB North America</i>
Supplementary literature	1. <i>B.J.Moniz, R.T.Miller: Welding skills book. Third Editon.</i> <a href="https://mmsallaboutmetallurgy.com/wp-content/uploads/2019/07/Welding-Skills-Book.pdf">https://mmsallaboutmetallurgy.com/wp-content/uploads/2019/07/Welding-Skills-Book.pdf</a> 2. <i>Handbook on Welding Techniques Athor Gwalior Maharajpur</i>

**3. TOTAL STUDENT WORKLOAD REQUIRED TO ACHIEVE EXPECTED LEARNING OUTCOMES EXPRESSED IN TIME AND ECTS CREDITS**

Student's activity		Student workload– number of hours (for example:)
Classes conducted under a direct supervision of an academic teacher or other persons responsible for classes	Participation in classes indicated in point 2.2	45
	Supervision hours	5
Student's own work	Preparation for classes	15
	Reading assignments	15
	Other (preparation for exams, tests, carrying out a project etc)	20
Total student workload		100
Final number of ECTS credits		4