

<b>Course code</b>																																	
<b>Type and description</b>	PD – elective course from a different discipline																																
<b>ECTS credit</b>	1																																
<b>Course name</b>	<b>Advanced Manufacturing</b>																																
<b>Course name in Polish</b>	<b>Zaawansowane Techniki Wytwarzania</b>																																
<b>Language of instruction</b>	English																																
<b>Course level</b>	8 PRK																																
<b>Course coordinator</b>	<b>Ph.D. D.Sc. Grzegorz Gumienny, prof. LUT,</b>																																
<b>Course instructors</b>	<b>Ph.D. D.Sc Grzegorz Gumienny, prof. LUT, Ph.D. D.Sc inż. Ryszard Władysław, prof. LUT, Ph.D. D.Sc. Paweł Just</b>																																
<b>Delivery methods and course duration</b>	<table border="1"> <thead> <tr> <th></th> <th>Lecture</th> <th>Tutorials</th> <th>Laboratory</th> <th>Project</th> <th>Seminar</th> <th>Other</th> <th>Total of teaching hours during semester</th> </tr> </thead> <tbody> <tr> <td>Contact hours</td> <td>15</td> <td></td> <td>0</td> <td></td> <td></td> <td></td> <td>15</td> </tr> <tr> <td>E-learning</td> <td>No</td> <td>No</td> <td>No</td> <td>No</td> <td>No</td> <td>No</td> <td></td> </tr> <tr> <td>Assessment criteria (weightage)</td> <td></td> <td></td> <td>0</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Lecture	Tutorials	Laboratory	Project	Seminar	Other	Total of teaching hours during semester	Contact hours	15		0				15	E-learning	No	No	No	No	No	No		Assessment criteria (weightage)			0				
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<b>Course objective</b>	1. The aim of the course is to enable PhD students to acquire knowledge in the field of modern casting and plastics processing.																																
<b>Learning outcomes</b>	<p>After completing the course PhD student is able to:</p> <ol style="list-style-type: none"> <li>1. characterize the processes influencing the physicochemical state of the liquid alloy;</li> <li>2. characterize the processes taking place during the alloy crystallization in the mold;</li> <li>3. evaluate and select the appropriate casting technology depending on the customer's requirements and the production batch;</li> <li>4. describe modern technologies used in the processing of macromolecular plastics;</li> <li>5. interpret and evaluate the influence of technological parameters on the quality of the molded part ;</li> </ol> <p>W1, W3, U3, K2</p>																																
<b>Assessment methods</b>	<p>Verification methods of learning outcomes:  learning outcome 1–5 – reports from laboratory exercises  The final grade consists of:  the grade of the laboratory reports – 100%</p>																																
<b>Prerequisites</b>																																	
<b>Course content with delivery methods</b>	<p>LABORATORY</p> <ol style="list-style-type: none"> <li>1. Ecological technology of ausferritic nodular cast iron. 4 h</li> <li>2. Basics of Lost Foam technology 3 h.</li> <li>3. Increasing the properties of high-quality aluminium alloys through intensive, computer-controlled mold cooling. 4 h</li> <li>4. Manufacturing of precision castings in investment casting technology 2 h</li> <li>5. The effect of injection parameters on the quality of products made of macromolecular materials. 2 h</li> </ol>																																
<b>Basic reference materials</b>	<ol style="list-style-type: none"> <li>1. Campbell, J. (2015). Complete casting handbook: metal casting processes, metallurgy, techniques and design. Butterworth-Heinemann.</li> <li>2. Malloy, R., Plastic Part Design for Injection Molding, Hanser/Gardner, Cincinnati (1994).</li> <li>3. Vijay K. Stokes, Introduction to Plastics Engineering, John Wiley &amp; Sons Ltd (2020)</li> </ol>																																
<b>Other reference</b>	1. Groover M.P., 2010. Fundamentals of Modern Manufacturing: Materials, Processes and																																

<b>materials</b>	Systems. 4th edition. John Wiley & Sons, Inc., USA. 2. M. Chanda, S. Roy, Plastics Technology Handbook 4th ed - (CRC, 2006)
<b>Average student workload outside classroom</b>	10 h
<b>Comments</b>	
<b>Last update</b>	March 2023