<table>
<tr><td>Course code</td><td></td></tr>
<tr><td>Type and description</td><td>EC</td></tr>
<tr><td>ECTS credit</td><td>1</td></tr>
<tr><td>Course name</td><td>Computer simulation of casting processes</td></tr>
<tr><td>Course name in Polish</td><td>Symulacja komputerowa procesów odlewania</td></tr>
<tr><td>Language of instruction</td><td>English</td></tr>
<tr><td>Course level</td><td>8 PRK</td></tr>
<tr><td>Course coordinator</td><td>Ph.D., D.Sc. Bogusław Pisarek, prof. LUT</td></tr>
<tr><td>Course instructors</td><td>Ph.D. D.Sc. Bogusław Pisarek, prof. LUT; Ph.D. D.Sc. Ryszard Władysiak, prof. LUT;
Ph.D. D.Sc. Grzegorz Gumienny, prof. LUT; Ph.D. D.Sc. Cezary Rapiejko; , prof. LUT</td></tr>
<tr><td>Delivery methods and course duration</td><td>
<table>
<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>
<tr><td>Contact hours</td><td>0</td><td>0</td><td>0</td><td>15</td><td>0</td><td>0</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>No</td></tr>
<tr><td>Assessment criteria (weightage)</td><td>0,00</td><td>0,00</td><td>0,00</td><td>1,00</td><td>0,00</td><td>0,00</td><td></td></tr>
</table>
</td></tr>
<tr><td>Course objective</td><td>1. The aim of the course is to enable PhD students to familiarize students with modern techniques of modelling and simulation of foundry processes using the MAGMA5 software.</td></tr>
<tr><td>Learning outcomes</td><td>After completing the course, a PhD student:

1) can recall and correctly interpret fundamental issues of a selected additional discipline unrelated to the dissertation - effect W4,
2) can select a methodology for conducting scientific research appropriate to the researched issue related to the dissertation being prepared - effect U4,
3) is ready to critically evaluate and analyze scientific achievements, including his own, in the area of doctoral studies, to carry out social tasks related to the ethos of the researcher, to act for the development of the knowledge economy - effect K1.</td></tr>
<tr><td>Assessment methods</td><td>Verification methods of learning outcomes:

Effects W4, U4, K1 – projects

The final grade consists of:

the grade of the projects – 100%</td></tr>
<tr><td>Prerequisites</td><td></td></tr>
</table>

Course content with delivery methods	PROJECT 1. Building a project in MAGMA5 - casting geometry, fill system and sand, ceramic mould or die; generation and optimization of the differential grid - discretization of the casting-mould system; selection of simulation parameters - description of casting parameters for selected casting techniques for sand, ceramic moulds or die and HTC heat transfer coefficients; visualization of the process of filling the mould cavity with metal; simulation of the crystallization and cooling process of the casting. 2. Optimization of the casting process and / or geometry: casting, casting system from the point of view of identified casting defects.
Basic reference materials	1. Mahi Sahoo, Ph.D., Sudhari "Sam" Sahu, Ph.D: Principles of Metal Casting, Third Edition, 2014, Publisher: McGraw-Hill Education: New York, ISBN: 9780071789752. 2. Magma5 - Manuals
Other reference materials	1. Campbell, J.: Complete Casting Handbook, 2011. Published by Elsevier Ltd.
Average student workload outside classroom	15h
Comments	
Last update	21 April 2023