<table>
<tr><td>Course code</td><td></td></tr>
<tr><td>Type and description</td><td>EC – elective subjects from the discipline of Mechanical Engineering</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>dr hab. inż. Bogusław Pisarek, prof. uczelni</td></tr>
<tr><td>Course instructors</td><td>dr hab. inż. Bogusław Pisarek, prof. uczelni; dr hab. inż. Ryszard Władysiak, prof. uczelni dr hab. inż. Grzegorz Gumienny, prof. uczelni; dr hab. inż. Cezary Rapiejko, prof. uczelni</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>5</td><td>0</td><td>0</td><td>5</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</td><td>0</td><td>0</td><td>100%</td><td>0</td><td>0</td><td>100%</td></tr>
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<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 program</td></tr>
<tr><td>Learning outcomes</td><td>A PhD student after completing the course is able to use:

1. CAD / CAM computer aided design and manufacturing systems – W1, U4, K3;
2. simulation methods to solve moderately complex engineering tasks related to flow and heat transfer – W1, U1, K1–K3.</td></tr>
<tr><td>Assessment methods</td><td>Verification methods of learning outcomes:

learning outcome 1, 2 – projects

The final grade consists of:

the grade of the projects – 100%</td></tr>
<tr><td>Prerequisites</td><td></td></tr>
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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	25h
Comments	
Last update	July 2020