| Type and description EC - elective subjects from the discipline of Mechanical Engineering ECTS credit 1 Course name Computer simulation of casting processes Course name in Polish Symulacja komputerowa procesów odlewania Language of instruction English Course level 8 PRK Course coordinator dr hab. inż. Boguslaw Pisarek, prof. uczelni dr hab. inż. Ryszard Władysiak, prof. uczelni dr hab. inż. Grzegorz Gumienny, prof. uczelni; dr hab. inż. Ryszard Władysiak, prof. uczelni dr hab. inż. Grzegorz Gumienny, prof. uczelni; dr hab. inż. Cezary Rapiejko, prof. uczelni dr hab. inż. Grzegorz Gumienny, prof. uczelni; dr hab. inż. Cezary Rapiejko, prof. uczelni Lecture Tutorials Laboratory Project Seminar Other Total of techning hours duning semestra Jesticki Jesti | Course code | | | | | | | | |
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| E-learning no | - | | Lecture | Tutorials | Laboratory | Project | Seminar | Other | teaching hours during |
| Assessment criteria (weightage) 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 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. Assessment methods Verification methods of learning outcomes: learning outcome 1, 2 – projects The final grade consists of: the grade of the projects – 100% | | Contact hours | 0 | 0 | 0 | 5 | 0 | 0 | 5 |
| Course objective 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 Learning outcomes 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. Assessment methods Verification methods of learning outcomes: learning outcome 1, 2 — projects The final grade consists of: the grade of the projects — 100% | | | no | no | no | no | no | no | no |
| modelling and simulation of foundry processes using the MAGMA5 program 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. Assessment methods Verification methods of learning outcomes: learning outcome 1, 2 — projects The final grade consists of: the grade of the projects — 100% | | criteria | 0 | 0 | 0 | 100% | 0 | 0 | 100% |
| 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. Assessment methods Verification methods of learning outcomes: learning outcome 1, 2 — projects The final grade consists of: the grade of the projects — 100% | Course objective | · | | | | | | | |
| 2. simulation methods to solve moderately complex engineering tasks related to flow and heat transfer - W1, U1, K1–K3. Verification methods of learning outcomes: learning outcome 1, 2 - projects The final grade consists of: the grade of the projects - 100% | Learning outcomes | A PhD student after completing the course is able to use: | | | | | | | |
| learning outcome 1, 2 — projects The final grade consists of: the grade of the projects — 100% | | 2. simulation methods to solve moderately complex engineering tasks related to flow and heat transfer | | | | | | | |
| The final grade consists of: the grade of the projects - 100% | Assessment methods | Verification methods of learning outcomes: | | | | | | | |
| the grade of the projects — 100% | | learning outcome 1, 2 – projects | | | | | | | |
| | | The final grade consists of: | | | | | | | |
| Prerequisites | | the grade of the projects — 100% | | | | | | | |
| | Prerequisites | | | | | | | | |

| Course content with | PROJECT | | |
|--|---|--|--|
| delivery methods | 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. Optimization of the casting process and / or geometry: casting, casting system from the point of view of identified casting defects. | | |
| Basic reference materials | Mahi Sahoo, Ph.D., Sudhari "Sam" Sahu, Ph.D: Principles of Metal Casting, Third Edition, 2014, Publisher: McGraw-Hill Education: New York, ISBN: 9780071789752. Magma5 – Manuals | | |
| Other reference materials | Campbell, J.: Complete Casting Handbook, 2011. Published by Elsevier Ltd. | | |
| Average student workload outside classroom | 25h | | |
| Comments | | | |
| Last update | July 2020 | | |