<table>
<tr><td>Course code</td><td></td></tr>
<tr><td>Type and description</td><td>Elective Course</td></tr>
<tr><td>ECTS credit</td><td>1</td></tr>
<tr><td>Course name</td><td>Computational Heat and Mass Transfer</td></tr>
<tr><td>Course name in Polish</td><td>Komputerowa analiza transportu ciepła i wilgoci</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>Marcin Koniorczyk</td></tr>
<tr><td>Course instructors</td><td>Marcin Koniorczyk, Witold Grymin, Dalia Bednarska</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></td></tr>
<tr><td>Assessment criteria (weightage)</td><td></td><td></td><td></td><td>1.0</td><td></td><td></td><td></td></tr>
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<tr><td>Course objective</td><td>Aims of the course is:
1. to extend knowledge in the heat and mass transfer,
2. to learn numerical methods used to solve elliptic and parabolic PDE,
3. to learn numerical methods used for the Stefan problem.</td></tr>
<tr><td>Learning outcomes</td><td>After the course student:
1. knows the basic mechanisms of heat transport W4
2. knows the basic mechanisms of mass transport W4
3. have the basic knowledge about porous materials, their microstructure, basic properties W4
4. knows how to formulate the weak form of governing equations W4
5. will be able to apply the numerical methods to solve the uncoupled governing equations U4
6. will be able to apply the numerical methods to solve the coupled heat and mass equations U4
7. will be able to solve the Stefan problem associated with the moving phase boundary U4</td></tr>
<tr><td>Assessment methods</td><td>Verification methods of learning outcomes:
effects no. 1-8: by worksheet project.
W4 - oral exam
U4, K1 – project seminar presentation
W4, U4 – written project
The final grade is composed of:
75% - project
25% - oral presentation of achieved solutions in project</td></tr>
<tr><td>Prerequisites</td><td></td></tr>
<tr><td>Course content with delivery methods</td><td>The porous materials – microstructure, properties
Macroscopic description of Transport Phenomena in Porous Media
Mathematical Statement of the Problem, uncoupled, coupled heat and mass transfer
Some special cases
Phase transition – description, kinetics, measurement
Stefan problem – moving boundary between phases
Finite Differential Method – introduction, application, error
Finite Element Method – introduction, application, error</td></tr>
</table>

Basic reference materials	1. J. Bear, Y. Bachmat, Introduction to Modelling of Transport Phenomena in Porous Media, Kluver Academic Press, 1991. 2. R.W. Lewis, B.A. Schrefler, The Finite Method in the Static and Dynamic Deformation and Consolidation of Porous Media, John Wiley and Sons 1998. 3. D.R.J. Owen, E. Hinton, Finite Element in Plasticity: Theory and Practice, Pineridge Press Ltd. 1980.
Other reference materials	
Average student workload outside classroom	10h
Comments	
Last update	Brak informacji