

Course code																																	
Type and description	Background Course																																
ECTS credit	2 and 2																																
Course name	Transport phenomena 1 and Transport phenomena 2																																
Course name in Polish	Zjawiska przenoszenia																																
Language of instruction	English																																
Course level	8 PRK																																
Course coordinator	Prof. dr. hab. inż. Marcin Bizukojć, Lodz. University of Technology, Faculty of Process and Environmental Engineering, Poland																																
Course instructors	Prof. dr. hab. inż. Marcin Bizukojć, Lodz. University of Technology, Faculty of Process and Environmental Engineering, Poland																																
Delivery methods and course duration	<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>30</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>30</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>0,00</td> <td></td> <td></td> <td></td> <td></td> <td>0,00</td> <td></td> </tr> </tbody> </table>		Lecture	Tutorials	Laboratory	Project	Seminar	Other	Total of teaching hours during semester	Contact hours	30	0	0	0	0	0	30	E-learning	No	No	No	No	No	No		Assessment criteria (weightage)	0,00					0,00	
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Course objective	Provide the knowledge on the fundamental principles (three pillars: momentum, heat and mass transfer) of chemical engineering.																																
Learning outcomes	After the course a PhD student we be able to: <ol style="list-style-type: none"> describe the momentum, heat and mass transfer phenomena with the use of valid mathematical tools: effects W1, W4, U3, K1 discuss the analogies between momentum, heat and mass transfer phenomena: effects W1, W4, U3, K1 apply the knowledge of transfer processes to describe the unit operations in chemical engineering: effects U3, K1, K2 																																
Assessment methods	The final grade consists of: Exam - 100% (effects W1, W4, U3, K1 i K2)																																
Prerequisites	None																																
Course content with delivery methods	Lecture: <ol style="list-style-type: none"> Momentum transfer, basic laws of fluid mechanics, differential balance of the flow, balance of energy in the flow, flow in the tube and other systems Heat transfer: differential balance of heat transfer, conduction, convection, radiation for various geometries 																																

	3. Mass transfer: differential balance of mass transfer, diffusion, convection, selected unit operations connected with mass transfer
Basic reference materials	Robert H. Perry (ed.) "PERRY'S CHEMICAL ENGINEERS' HANDBOOK" McGraw and Hill, New York
Other reference materials	Materials of the lecturer
Average student workload outside classroom	15 h
Comments	
Last update	