

Course code																																	
Type and description	EC – elective subjects from the discipline of Mechanical Engineering																																
ECTS credit	1																																
Course name	Heat transfer																																
Course name in Polish	Wymiana ciepła																																
Language of instruction	English																																
Course level	8 PRK																																
Course coordinator	dr hab. inż. Artur Gutkowski																																
Course instructors	dr hab. inż. Artur Gutkowski, dr inż. Marcin Łęcki																																
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>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> </tbody> </table>		Lecture	Tutorials	Laboratory	Project	Seminar	Other	Total of teaching hours during semester	Contact hours	0	0	0	5	0	0	5	E-learning	no	no	no	no	no	no	no	Assessment criteria (weightage)	0	0	0	100%	0	0	100%
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Course objective	The aim of the subject is to broaden a knowledge and deepening understanding in heat transfer processes taking place in technical devices.																																
Learning outcomes	<p>After the course, PhD. student will be able to:</p> <ol style="list-style-type: none"> 1. Identify and describe the fundamentals of heat transfer processes , [W1 P8S_EG, U2 P8S_UK], 2. Answer heat transfer – related research questions [W1 P8S_EG ,U2 P8S_UK, K1 P8S_KK], 3. Plan and conduct systematic research studies on heat transfer problems [W2 P8S_EG, U1 P8S_UW], 4. Recommend heat transfer systems designs or R&D activities and communicate these to various stakeholders [W2 P8S_EG, U1 P8S_UW, K2 P8S_KO]. 																																
Assessment methods	<p>effect 1, 2, 3 and 4 – presentation,</p> <p>Final mark determined on the basis of: presentation - 100%.</p>																																
Prerequisites	Student should have basic knowledge of mathematics, physics, thermodynamics and fluid mechanics and heat transfer																																
Course content with delivery methods	<ol style="list-style-type: none"> 1. Mathematical description of heat transfer processes, 2. Extended analysis of heat transfer by conduction and convection, 3. Methods of heat transfer intensification, 4. Measurement methods used in heat transfer investigations, 5. Extended analysis of heat transfer by radiation, 6. Heat transfer during phase change processes, 7. Methods of heat exchanger calculations. 																																
Basic reference materials	<ol style="list-style-type: none"> 1. Cengel Y.A.: <i>Introduction to Thermodynamics and Heat Transfer</i>, Second Edition, McGraw-Hill, 2008, 																																

	<ol style="list-style-type: none"> 2. Holman J.P.: <i>Heat Transfer</i>, Tenth Edition, McGraw-Hill, 2009, 3. Bergman T.L., Lavine A.S., Incropera F.P., Devitt D.P.: <i>Fundamentals of Heat and Mass Transfer</i>, John Wiley & Sons, Inc., 2011, 4. Kutz M.: <i>Heat-Transfer Calculations</i>, New York, McGraw-Hill, 2006.
Other reference materials	<ol style="list-style-type: none"> 1. Serth R.W.: <i>Process Heat Transfer: Principles and Applications</i>, Amsterdam, Elsevier, cop. 2007, 2. Kaviany M.: <i>Heat Transfer Physics</i>, Cambridge University Press, 2008, 3. Lienhard IV J.H., Lienhard V J.H.: <i>A Heat Transfer Textbook</i>. 4th edition, Phlogiston Press, Cambridge Massachusetts, 2002.
Average student workload outside classroom	15 h
Comments	
Last update	July 2020