GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Thermodynamics for Medical and Mechanical Engineering, PG_00039311		
Field of study	Medical and Mechanical Engineering, Medical and Mechanical Engineering		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2021/2022
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	3	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Energy and Industrial Apparatus -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Jan Stąsiek	
	Teachers	dr hab. inż. Michał Klugmann prof. dr hab. inż. Jan Stąsiek dr inż. Marcin Jewartowski dr inż. Paweł Dąbrowski	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	8.0	7.0	0.0	0.0	45

E-learning hours included: 0.0

Termodynamika dla IMM, W, IMM, sem.03, zimowy 21/22, (M:31672W0) - Moodle ID: 18622
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=18622

Termodynamika dla IMM, L, IMM, sem.03, zimowy 21/22, (M:31672W0) - Moodle ID: 18623
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=18623

Termodynamika dla IMM, C, IMM, sem.03, zimowy 21/22, (M:31672W0) - Moodle ID: 18624
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=18624

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	45	3.0	27.0	75

Subject objectives

Students acquire basic knowledge of thermodynamics in the dimension of theory and practice

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_W08	tudent defines basic concepts of thermodynamic, 1st and 2nd Law of Thermodynamic and equations of state of gases. Student describes and analyses gas and steam thermodynamic processes and cycles and heat transport mechanisms. Student measures basic thermodynamic parameters and analysis energy balance of heat engines and devices.	[SW1] Assessment of factual knowledge
K6_U05	tudent defines basic concepts of thermodynamic, 1st and 2nd Law of Thermodynamic and equations of state of gases. Student describes and analyses gas and steam thermodynamic processes and cycles and heat transport mechanisms. Student measures basic thermodynamic parameters and analysis energy balance of heat engines and devices.	[SU1] Assessment of task fulfilment

<table>
<tr><td>Subject contents</td><td colspan="3">LECTURE: Basic concepts. The first law of thermodynamics for closed and open systems. Properties of ideal, semi-ideal and real gases. Gas laws. Thermal and caloric equation of state. Thermodynamic processes of ideal gas. Thermodynamics gas cycles. The second law of thermodynamics. Entropy. Steam and steam cycles. Exergy. Fundamentals of heat transfer. TUTORIALS: Pressure. Simple conversion of energy. Heat. Work. 1st Law of Thermodynamic. State and functions of state of ideal and semi-ideal gases. Gas mixtures. Thermodynamic processes. Gas thermodynamic cycles. Steam and steam cycles. Basic methods of heat transfer.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">Knowledge from course of physics and mathematics.</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Written test</td><td>56.0%</td><td>50.0%</td></tr>
<tr><td>Reports and oral or written test from laboratories</td><td>56.0%</td><td>50.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">1. Pudlik W., Termodynamika. Wyd. PG, 1998. 2. Wiśniewski S., Termodynamika techniczna. WNT, 2005 3. Pudlik W. (red.), Termodynamika - Laboratorium I miernictwa cieplnego. Wyd. PG, 1993. 4. Pudlik W. (red.), Termodynamika - Laboratrorium II badania maszyn i urządzeń. Wyd. PG, 1991.</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">1. Mayhew R., Engineering thermodynamics/Work & Heat Transfer. J. Wiley & Sons Inc. 1993. USA.</td></tr>
<tr><td>eResources addresses</td><td colspan="2"></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">Present equations of first low of thermodynamics. Describe Carnot Cycle. Describe Rankine Cycle. Present definitions of second low of thermodynamics. Present basic mechanisms of heat transfer.</td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
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