GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Numerical Modelling in flow systems design (WM), PG_00042087		
Field of study	Power Engineering, Power Engineering, Power Engineering, Power Engineering, Power Engineering		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2022/2023
Education level	first-cycle studies	Subject group	
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	English
Semester of study	6	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Energy and Industrial Apparatus -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Tomasz Muszyński	
	Teachers	dr hab. inż. Tomasz Muszyński	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	0.0	0.0	15.0	30

E-learning hours included: 0.0

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	30	5.0	65.0	100

Subject objectives

Presentation of the basics of computer modelling of processes from the area of heat technology so that the student could be able to understand and interprete the results obtained using numerical codes.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_W06	Knowledge of basic methods and optimization algorithms for the selection of energy devices	[SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects
K6_U05	Student can evaluate and use common methods and tools we do solutions to the problem of energy balance, setting designated methods and tools	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools
K6_U01	The student has experience in implementing examples on their own, related to the modeling of energy processes and devices	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject

Subject contents

1 Introduction to the calculation possibilities of the EES / Matlab calculation code 2. Introduction to the computational capabilities of the Ansys computational code. 3. Implementation of an individual project

Prerequisites and co-requisites

mathematics I, II, III, physics, fluid mechanics

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Presentation	60.0%	40.0%
Final test	60.0%	60.0%

Recommended reading

Basic literature	Patankar S.V. Numerical Heat Transfer and Fluid Flow, Taylor and Francis, 1980.

	Supplementary literature	Minkowycz W. J., Sparrow E. M., Schneider G. E., Pletcher R. H., Handbook of Numerical Heat Transfer, Whiley, 1988 Dinçer I,Rosen M.A., Ahmadi P. Optimization of Energy Systems Whiley, 2017
	eResources addresses	Adresy na platformie eNauczanie: Numerical Modelling in flow systems design , W/L ,Energetyka. sem 6, lato 22/23 PG_00042087 - Moodle ID: 29380 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=29380
Example issues/ example questions/ tasks being completed	Pinch analysis,heat exchanger network optimization,combined heat and power generation	
Work placement	Not applicable	