GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Numerical methods in thermal problems, PG_00055946		
Field of study	Power Engineering, Power Engineering, Power Engineering		
Date of commencement of studies	October 2021	Academic year of realisation of subject	2023/2024
Education level	first-cycle studies	Subject group	Optional subject group 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	3	Language of instruction	Polish
Semester of study	6	ECTS credits	3.0
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. Jacek Barański	
	Teachers	dr hab. inż. Jacek Barański	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	0.0	30.0	0.0	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	8.0	37.0	75

Subject objectives

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

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U06] is able to use the basic knowledge on the operation of energy equipment in the field of thermal power plants, thermal and energy and heating systems, combustion engines, compressors and rotating machines to assess the technical condition of the system	Students will be able to use basic knowledge of the operation of power equipment in the field of thermal power plants, thermal power and heating systems, internal combustion engines and compressors and rotating machinery to assess the technical condition of the system.	[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information
[K6_W11] has knowledge of known technologies and non-technical aspects to solve simple engineering tasks in the field of energy systems and devices	The student has the knowledge of the known technologies and non-technical aspects to solve simple engineering tasks in the field of energy systems and equipment.	[SW1] Assessment of factual knowledge
[K6_U08] can design the basic parameters of the selected technology related to energy conversion and select auxiliary devices and evaluate the project in terms of technical and economic	Students will be able to design the basic parameters of a selected energy conversion technology and select auxiliary equipment and evaluate the design from a technical point of view.	[SU1] Assessment of task fulfilment [SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools

Subject contents

Presentation of capabilities ANSYS Fluent of commercial package CFD

Prerequisites and co-requisites

mathematics, physics, fluid mechanics, heat transfer

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Final assessment on the basis of reports or presentations	56.0%	100.0%

Recommended reading

Basic literature

1. 1.Patankar S.V. Numerical Heat Transfer and Fluid Flow, Taylor and Francis, 1980.
2. 2.Minkowycz W. J., Sparrow E. M., Schneider G. E., Pletcher R. H., Handbook of Numerical Heat Transfer, Whiley, 1988
3. ANSYS - User's Guide

	Supplementary literature	1. Pope, Stephen B. Turbulent Flows. Cambridge University Press 2000.
	eResources addresses	Adresy na platformie eNauczanie: Metody numeryczne w zagadnieniach cieplnych, P, E, sem.6, letni 23/24 - Moodle ID: 38462 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=38462
Example issues/ example questions/ tasks being completed	Analysis of the physical phenomenon and the possibility of analysis in the numerical code. Solving engineering problems using advanced commercial tools.	
Work placement	Not applicable	