



## Subject card

Subject name and code	Thermal Devices Design, PG_00055512						
Field of study	Mechanical Engineering						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2024/2025		
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			4.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Institute of Energy -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Paweł Ziółkowski				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	30.0	0.0	60
	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	60		5.0		35.0	100
Subject objectives	The aim of the course is to present the possibilities of numerical tools for the design of thermal equipment and cooperation between them						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W09] possesses basic knowledge within the range of thermodynamics and fluid mechanics, construction and operation of heat generating devices, process equipment, including renewable energy sources, cooling and air conditioning		The student has basic knowledge of thermodynamics and fluid mechanics, construction and operation of thermal power equipment, process apparatus, including renewable energy sources and refrigeration and air conditioning		[SW1] Assessment of factual knowledge		
	[K6_W11] possesses knowledge on design, technology and manufacturing of machine parts, metrology, and quality control; knows and understands methods of measuring and calculating basic values describing the operation of mechanical systems, knows basic calculating methods applied to analyse the results of experiments		The student has knowledge of the design of machine parts, knows and understands the principles of calculation of basic quantities describing the operation of mechanical systems, knows the basic calculation methods.		[SW1] Assessment of factual knowledge		
	[K6_U03] is able to identify, formulate and develop the documentation of a simple design or technological task, including the description of the results of this task in Polish or in a foreign language and to present the results using computer software or other aiding tools		The student is able to identify, formulate and prepare documentation of a simple design task including a description of the results of this task in Polish or foreign language and make a presentation of the results using computer programs.		[SU1] Assessment of task fulfilment [SU5] Assessment of ability to present the results of task		
Subject contents	Design of selected flow devices, e.g.: turbine stages, heat exchangers. Design of cooperation between different devices, ability to select boundary conditions and scope of work of a given element.						
Prerequisites and co-requisites							

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Credit for the project based on the presentation	56.0%	50.0%
	Written credit	56.0%	50.0%
Recommended reading	Basic literature	<p>1. S. Perycz: Turbiny parowe i gazowe, Wydaw. Politechniki Gdańskiej, Gdańsk, 1988</p> <p>2. J. Madejski: Teoria wymiany ciepła, Wydaw. Politechniki Szczecińskiej, Szczecin 1998.</p>	
	Supplementary literature	<p>1. Patankar S.V. Numerical Heat Transfer and Fluid Flow, Taylor and Francis, 1980.</p> <p>2. Minkowycz W. J., Sparrow E. M., Schneider G. E., Pletcher R. H., Handbook of Numerical Heat Transfer, Wiley, 1988</p>	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Balances necessary for equipment design Operating conditions Boundary conditions		
Work placement	Not applicable		