



Subject card

Subject name and code	Basic principles of heating, PG_00040109						
Field of study	Mechanical 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	Part-time studies	Mode of delivery			at the university		
Year of study	3	Language of instruction			Polish		
Semester of study	6	ECTS credits			5.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Zakład Ogrzewnictwa, Wentylacji, Klimatyzacji i Chłodziwnictwa -> Institute of Energy -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Marcin Jewartowski				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	22.0	0.0	15.0	0.0	0.0	37
	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	37		11.0		77.0	125
Subject objectives	Students acquire basic knowledge of heating in in terms of theory and practice						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[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		Student is able to calculate the thermal load of buildings and design simple heating installations with the use of dedicated software.		[SU1] Assessment of task fulfilment		
	[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 is able to characterize heating systems, their components and functioning.		[SW1] Assessment of factual knowledge		
Subject contents	LECTURE: Basic concepts and regulations regarding heating and district heating. Designed heat load of buildings. Central heating systems. Hot tap water systems. Heat sources in heating. Heat centres. Radiators. Heating pipes and their thermal insulation. Guidelines for design and calculations of central heating systems. Hydraulic control. Passive buildings. LABORATORY: Heat sources (water boiler, solar collector). Radiators. Calculations of designed heat load using commercial software. Design of heating installations using commercial software						
Prerequisites and co-requisites	Knowledge from course of Thermodynamics						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Laboratory: attendance and reports		100.0%		20.0%		
	Lecture: written exam		56.0%		80.0%		

Recommended reading	Basic literature	<ol style="list-style-type: none"> 1. Pr. zbiorowa pod red. T.R.Fodemskiego, Wentylacja, klimatyzacja, ogrzewanie. Projektowanie, montaż, eksploatacja, modernizacja. Verlag Dashofer, Warszawa, 2010. 2. Pieńkowski K., Krawczyk D., Tumel W., Ogrzewnictwo. Politechnika Białostocka, Białystok, 1999. 3. Recknagel, Sprenger, Schramek, Kompendium ogrzewnictwa i klimatyzacji. Omni Scala, Wrocław, 2008. 4. Pr. zbiorowa Albers J. i inni, Systemy centralnego ogrzewania i wentylacji. Poradnik. WNT, Warszawa, 2007.
	Supplementary literature	standards and regulations for calculating the design heat load and energy performance of buildings
	eResources addresses	
Example issues/ example questions/ tasks being completed	Present classification of central heating systems. Characterize the pressure losses in pipes.	
Work placement	Not applicable	