



Subject card

Subject name and code	Heat Distribution Network , PG_00048010						
Field of study	Environmental Engineering						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2023/2024		
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	Part-time studies	Mode of delivery			at the university		
Year of study	4	Language of instruction			Polish		
Semester of study	8	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Sanitary Engineering -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Ewa Zaborowska					
	Teachers	dr hab. inż. Ewa Zaborowska					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	0.0	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	4.0	75.0	109		
Subject objectives	The aim of the subject is to acquaint students with detailed knowledge in the range of heating networks, current regulations and standards related to the subject, materials types and selection criteria, designing methods and technologies of installation, including other than technical conditions. The subject objective is to acquire skills in the range of utilising and converting different sources of information and data bases, application of calculation methodology and the principles of designing.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_U12] can design installations, networks and facilities: water supply, sewage, heating and gas	can design heating networks			[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment		
	[K6_U03] can prepare documentation regarding the implementation of an engineering task/project and prepare a text or presentation including a discussion of the results of the implementation	can prepare documentation on the implementation of the heating network project			[SU5] Assessment of ability to present the results of task [SU1] Assessment of task fulfilment		
	[K6_W09] has ordered, theoretically founded knowledge in the field of water supply, sewage, heating, ventilation and air conditioning, and the principles of shaping the microclimate of rooms; knows legal regulations, standardization issues and recommendations for the design of water supply, sewage, heating and gas networks and installations	has an ordered, theoretically founded knowledge of heating in the field of networks and underground heating installations			[SW1] Assessment of factual knowledge		
	[K6_U13] knows the rules of application and can choose the materials of the sanitary industry	knows the rules of application and is able to select materials for the sanitary industry in the field of heating networks			[SU3] Assessment of ability to use knowledge gained from the subject		

Subject contents	LECTURE: Classification, configuration and systems of heat distribution networks. Traditional and preinsulated, underground and over ground systems. Materials, components, fittings. Preinsulated systems characteristics. Monitoring systems. Methods of preinsulated underground pipes designing. Stress, elongation, compensators, fixed points. Compensation area. Branches, walls crossing, preinsulated fittings. Principles of assembling, joint sets. Pipes laying in excavation, distance from obstacles, buildings, other pipelines. Heat loss. Technical requirements, codes and standards. TUTORIALS/PROJECT: Project of a district heating preinsulated network. Location of fixed points, pipelines geometry, dimensioning of compensation area. Designing of branches, walls and underground obstacles crossings, pipes laying in excavation. Technical requirements and test.		
Prerequisites and co-requisites	Basics of hydraulics and heating systems. Knowledge from the courses: Thermal engineering and heating, Hydraulics, Heating systems		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Midterm colloquium	50.0%	50.0%
	Project	50.0%	50.0%
Recommended reading	Basic literature	1. Randlov. P.: Podręcznik ciepłownictwa system rur preizolowanych. European District Heating Pipe Manufactures Association, Fredericia, Dania 1998. 2. Żarski K.: Projektowanie preizolowanych sieci ciepłych w technologii ABB Zamech, ABB Zamech Ltd, Toruń 1994. 3. Regulations and standards related to the subject. http://isap.sejm.gov.pl/VolumeServlet?type=wdu . 4. Warunki techniczne wykonania i odbioru COBRTI INSTAL oraz PZITS. 5. Manufacturers guidelines, data sheets of fittings and devices, e.g.: http://www.zpum.pl/images/2_Wytyczne_do_Projektowania_2015.pdf	
	Supplementary literature	1. Krygier K.: Sieci ciepłownicze. Materiały pomocnicze do ćwiczeń. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2012. 2. Nantka M.: Ogrzewnictwo i ciepłownictwo. Wydawnictwo Politechniki Śląskiej, Gliwice 2010 lub 2013. 3. Technical professional magazines.	
	eResources addresses	Adresy na platformie eNauczanie: Sieci ciepłownicze_2023/2024 (lato) - Moodle ID: 36952 https://enauzanie.pg.edu.pl/moodle/course/view.php?id=36952	
Example issues/ example questions/ tasks being completed	Design of an underground installation / heating network made of pre-insulated pipes		
Work placement	Not applicable		