GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00059188		
Field of study	Environmental Engineering		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2026/2027
Education level	first-cycle studies	Subject group	Obligatory subject group 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	7	ECTS credits	6.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Sanitary Engineering -> Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Ewa Zaborowska	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	10.0	0.0	15.0	0.0	40

E-learning hours included: 0.0

eNauczanie source addresses:

Moodle ID: 7547 Ogrzewnictwo-NST_2026/2027 (zima)
https://enauczanie.pg.edu.pl/2025/course/view.php?id=7547

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	40	8.0	102.0	150

Subject objectives

The aim of the subject is to to acquaint students with detailed knowledge in the range of heating substations,current regulations and standards related to the subject, materials types and selection criteria, methods andtools supporting designing process, 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 sourcesof information, application of calculation methodology and the principles of designing.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U11] can use selected computer programs to support design, including CAD graphics programs	Can use selected computer programs supporting design (e.g., heat exchangers selection)	[SU4] Assessment of ability to use methods and tools
[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 and theoretically founded knowledge in the field of heating, knows design recommendations	[SW1] Assessment of factual knowledge
[K6_U12] can design installations, networks and facilities: water supply, sewage, heating and gas	Knows how to design a heating substation	[SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment

Subject contents	Course content – lecture Lectures: Heating substations classification. Direct and indirect heating substations. Hydraulic schematic diagrams. Heat exchange and heat exchangers. Functional modules of heating substations. Fittings, devicesand piping. Automatic control system. Safety device. Filling and refilling water system. Heating substationrooms. Water and wastewater installations in heating substation room. Regulations, standards, technical requirements. Technical requirements and tests. Heating energy tariffs and costs. Course content – exercises Tutorials: Calculations in the range of heating substations, supporting project. Course content – project Project: Project of heating substation, joined to high-parametersdistrict heating network. Schematic, technological diagrams. Hydraulic calculations of primary and secondarycircuits. Fittings, devices and thermal insulation matching. Filling and refilling systems. Water, sewage and ventilation systems in a heating substation room. Presentation in the field of heating systems.
Prerequisites and co-requisites	Basics of hydraulics and thermodynamics.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Project	50.0%	40.0%
Written exam	50.0%	60.0%

Recommended reading		
	Basic literature	1. Zaborowska E., Zasady projektowania wodnych węzłów ciepłowniczych. Wydawnictwo Politechniki Gdańskiej, Gdańsk, 2010 ornext editions. 2. Żarski K.: Węzły cieplne w miejskich systemach ciepłowniczych. Poradnik. Wyd. 2. Wydawnictwo Instal, Warszawa2014. 3. Regulations, Polish and European Standards related to the subject, COBRTI Instal technical requirements.
	Supplementary literature	1. Wolski A., Kaiser K., Legionella w instalacjach budynków. Ośrodek Informacji Technika instalacyjna w budownictwie, Warszawa, 2009. 2.Wytyczne producentów, karty katalogowe armatury i urządzeń.
	eResources addresses	
Example issues/ example questions/ tasks being completed	Project of a heating substation.	
Practical activites within the subject	Not applicable	

Document generated electronically. Does not require a seal or signature.