GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

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| Subject name and code | District Heating, PG_00039899 | | |
| Field of study | Mechanical Engineering, Mechanical Engineering | | |
| Date of commencement of studies | October 2020 | Academic year of realisation of subject | 2022/2023 |
| Education level | first-cycle studies | Subject group | Optional subject group<br>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 |

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| Conducting unit | Department of Energy and Industrial Apparatus -> Faculty of Mechanical Engineering and Ship Technology | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr inż. Marcin Jewartowski |
| | Teachers | dr inż. Marcin Jewartowski<br>dr hab. inż. Jan Wajs<br>mgr inż. Piotr Jasiukiewicz<br>dr hab. inż. Jacek Barański |

Lesson types and methods of instruction

| Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
|---|---|---|---|---|---|---|
| Number of study hours | 30.0 | 0.0 | 15.0 | 15.0 | 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 | 6.0 | 34.0 | 100 |

Subject objectives: Students acquire basic knowledge of heating in the dimension 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 auxiliary 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 about heating and heat engineering. 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 centres. Heat sources (water boiler, solar collector). Radiators. Calculations of designed heat load using commercial software. PROJECT: Design of central heating installation for a selected building

Prerequisites and co-requisites: Knowledge from course of Thermodynamics

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| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | Project | 100.0% | 30.0% |
| | Written exam | 56.0% | 50.0% |
| | Laboratory reports | 100.0% | 20.0% |
| Recommended reading | Basic literature | 1. Pr. zbiorowa pod red. T.R.Fodemskiego, Wentylacja, klimatyzacja, ogrzewanie. Projektowanie, montaż, eksploatacja, modernizacja. Verlag Dashofer, Warszawa, 2010.<br>2. Pieńkowski K., Krawczyk D., Tumel W., Ogrzewnictwo. Politechnika Białostocka, Białystok, 1999.<br>3. Recknagel, Sprenger, Schramek, Kompendium ogrzewnictwa i klimatyzacji. Omni Scala, Wrocław, 2008. | |
| | Supplementary literature | 1. Pr. zbiorowa Albers J. i inni, Systemy centralnego ogrzewania i wentylacji. Poradnik. WNT, Warszawa, 2007.<br>2. Mielnicki J.S., Centralne ogrzewanie, regulacja i eksploatacja. Arkady, Warszawa, 1974.<br>3. Polskie Normy do obliczania obciążenia cieplnego budynków. | |
| | eResources addresses | Adresy na platformie eNauczanie:<br>Ogrzewnictwo, W/L/P, MiBM, sem.06, letni 22/23 - Moodle ID: 29400<br>https://enauczanie.pg.edu.pl/moodle/course/view.php?id=29400 | |
| Example issues/ example questions/ tasks being completed | Present classification of central heating systems. Characterize the pressure losses in pipes. | | |
| Work placement | Not applicable | | |