



## Subject card

|                                             |                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                 |                                     |                               |            |     |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------|------------|-----|
| Subject name and code                       | , PG_00060036                                                                                                                                                                                                                                                                                                                                                                                                    |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                 |                                     |                               |            |     |
| Field of study                              | Power Engineering, Power Engineering, Power Engineering                                                                                                                                                                                                                                                                                                                                                          |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                 |                                     |                               |            |     |
| Date of commencement of studies             | February 2026                                                                                                                                                                                                                                                                                                                                                                                                    |                                                          | Academic year of realisation of subject                                                                                                                                                                                                                                                                                                                                                         |                                     | 2026/2027                     |            |     |
| Education level                             | second-cycle studies                                                                                                                                                                                                                                                                                                                                                                                             |                                                          | Subject group                                                                                                                                                                                                                                                                                                                                                                                   |                                     |                               |            |     |
| Mode of study                               | Full-time studies                                                                                                                                                                                                                                                                                                                                                                                                |                                                          | Mode of delivery                                                                                                                                                                                                                                                                                                                                                                                |                                     | at the university             |            |     |
| Year of study                               | 1                                                                                                                                                                                                                                                                                                                                                                                                                |                                                          | Language of instruction                                                                                                                                                                                                                                                                                                                                                                         |                                     | Polish                        |            |     |
| Semester of study                           | 2                                                                                                                                                                                                                                                                                                                                                                                                                |                                                          | ECTS credits                                                                                                                                                                                                                                                                                                                                                                                    |                                     | 3.0                           |            |     |
| Learning profile                            | general academic profile                                                                                                                                                                                                                                                                                                                                                                                         |                                                          | Assessment form                                                                                                                                                                                                                                                                                                                                                                                 |                                     | assessment                    |            |     |
| 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                                                                                                                                                                                                                                                                                                                                                                                            | 30.0                                                     | 0.0                                                                                                                                                                                                                                                                                                                                                                                             | 0.0                                 | 15.0                          | 0.0        | 45  |
|                                             | 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                                                                                                                                                                                                                                                                                                                                                                                            | 45                                                       |                                                                                                                                                                                                                                                                                                                                                                                                 | 5.0                                 |                               | 30.0       | 80  |
| Subject objectives                          | The aim of the course is to provide knowledge about installations related to heat sources (heating water circuits, fuel and exhaust installations, ventilation and water and sewage installations in the heat source room), legal regulations and standards, installation materials and criteria for their selection, basics of design, methods and technologies for implementing the installations in question. |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                 |                                     |                               |            |     |
| Learning outcomes                           | Course outcome                                                                                                                                                                                                                                                                                                                                                                                                   |                                                          | Subject outcome                                                                                                                                                                                                                                                                                                                                                                                 |                                     | Method of verification        |            |     |
| Subject contents                            | Course content – lecture<br><br>Fuels, fuel installations/storage and combustion processes, boilers and boiler rooms, heat pumps, heating water circuits, combustion installations, accompanying installations in heat source rooms - ventilation, water and sewage.                                                                                                                                             |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                 |                                     |                               |            |     |
| Prerequisites and co-requisites             | Basics of hydraulics and thermodynamics. Knowledge in the range of heating and tap hot water systems. Drawing skills in AutoCAD.<br><br>Knowledge from the subjects related to heating systems at the engineering level.                                                                                                                                                                                         |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                 |                                     |                               |            |     |
| Assessment methods and criteria             | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                         |                                                          | Passing threshold                                                                                                                                                                                                                                                                                                                                                                               |                                     | Percentage of the final grade |            |     |
|                                             | Test                                                                                                                                                                                                                                                                                                                                                                                                             |                                                          | 50.0%                                                                                                                                                                                                                                                                                                                                                                                           |                                     | 50.0%                         |            |     |
|                                             | Project                                                                                                                                                                                                                                                                                                                                                                                                          |                                                          | 50.0%                                                                                                                                                                                                                                                                                                                                                                                           |                                     | 50.0%                         |            |     |
| Recommended reading                         | Basic literature                                                                                                                                                                                                                                                                                                                                                                                                 |                                                          | 1. Lewandowski W.M.: Proekologiczne źródła energii odnawialnej, WNT, Warszawa 2006. 2. Zaborowska E.: Projektowanie kotłowni wodnych na paliwa ciekłe i gazowe. Wydawnictwo PG, Gdańsk 2012/2013 etc. 3. Zalewski W.: Pompy ciepła sprężarkowe, sorpcyjne i termoelektryczne. IPPU Masta, Gdańsk 2001. 4. Przepisy prawne i Polskie Normy związane z tematem, warunki techniczne COBRTI Instal. |                                     |                               |            |     |

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|                                                                | Supplementary literature                                                                  | 1. Nantka M.: Ogrzewnictwo i ciepłownictwo. Wydawnictwo Politechniki Śląskiej, Gliwice 2006. 2. Rubik M.: Pompy ciepła w systemach geotermii niskotemperaturowej. MULTICO Oficyna Wydawnicza, Warszawa 2011. 3. Skorek J., Kalina J.: Gazowe układy kogeneracyjne. WNT, Warszawa 2005. 4. Wiśniewski G. i in.: Kolektory słoneczne. Energia słoneczna w mieszkalnictwie, hotelarstwie i drobnym przemyśle. Dom Wydawniczy MEDIUM, Warszawa 2008. 5. Żarski K.: Obiegi wodne i parowe w kotłowniach. Poradnik projektanta. Ośrodek Informacji Technika instalacyjna w budownictwie, Warszawa 2000. 6. Wytyczne projektowania i karty katalogowe producentów. |
|                                                                | eResources addresses                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Example issues/<br>example questions/<br>tasks being completed | Design of a complex heat source, including the use of renewable or hybrid energy sources. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Practical activities within<br>the subject                     | Not applicable                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

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