



## Subject card

|   |   |  |  |                                     |   |            |     |
|---|---|--|--|-------------------------------------|---|------------|-----|
| Subject name and code                       | Fluid-flow machinery, PG_00057407   |  |  |                                     |   |            |     |
| Field of study                              | Mechanical Engineering  |  |  |                                     |   |            |     |
| Date of commencement of studies             | February 2024   |  | Academic year of realisation of subject  |                                     | 2024/2025   |            |     |
| Education level                             | second-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                               | 1   |  | Language of instruction  |                                     | English   |            |     |
| Semester of study                           | 2   |  | ECTS credits   |                                     | 3.0   |            |     |
| Learning profile                            | general academic profile  |  | Assessment form  |                                     | assessment  |            |     |
| Conducting unit                             | Department of Energy and Industrial Apparatus -> Faculty of Mechanical Engineering and Ship Technology  |  |  |                                     |   |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor  |  | prof. dr hab. inż. Krzysztof Kosowski  |                                     |   |            |     |
|   | Teachers  |  |  |                                     |   |            |     |
| Lesson types and methods of instruction     | 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   |  | 6.0                                 |   | 24.0       | 75  |
| Subject objectives                          | Basic knowledge of turbomachinery principle of operation and turbomachinery enrgy power plants.   |  |  |                                     |   |            |     |
| Learning outcomes                           | Course outcome  |  | Subject outcome  |                                     | Method of verification  |            |     |
|   | [K7_W03] possesses a profound knowledge on thermodynamic processes and their simulation, knows simulation methods and programs aiding the design and operation of power generating machines and process equipment, including renewable energy sources, air conditioning and cooling |  | Student can discuss advanced thermodynamical problems connected with design and operation of turbomachinery. |                                     | [SW1] Assessment of factual knowledge   |            |     |
|   | renewable energy sources, air conditioning and cooling  |  |  |                                     |   |            |     |
|   | [K7_U06] when solving engineering problems on design, technology and operation of machines is able to assess and classify typical methods and tools, define systemic and ex-technical aspects using modern calculating methods and design tools or modifying the current ones       |  | Student can apply modern methods of turbomachinery design calculations                                       |                                     | [SU4] Assessment of ability to use methods and tools<br>[SU3] Assessment of ability to use knowledge gained from the subject<br>[SU1] Assessment of task fulfilment |            |     |
|   | [K7_U07] is able to perform a preliminary economic analysis of the undertaken engineering actions within the range of design, production and operation of machines and technical devices  |  | Student can discuss the basic methods of economic aspects of turbomachinery power plants                     |                                     | [SU4] Assessment of ability to use methods and tools<br>[SU2] Assessment of ability to analyse information  |            |     |
| Subject contents                            | [K7_W05] possesses profound knowledge on the operation of complex systems and mechanical devices, including process equipment   |  | Student can present principles of operation of turbomachinery power plants                                   |                                     | [SW1] Assessment of factual knowledge   |            |     |
|   | Basics of thermodynamical cycles. Elements of turbine power plants. Fluid problems in turbomachinery. Theory of turbine stages. Turbine flow parts.   |  |  |                                     |   |            |     |

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| Prerequisites and co-requisites                                | Basics of mechanics, fluid mechanics and thermodynamics. |  |                               |
| Assessment methods and criteria                                | Subject passing criteria                                 | Passing threshold  | Percentage of the final grade |
|  | Written exam   | 60.0%  | 100.0%                        |
| Recommended reading  | Basic literature   | Perycz S., Turbiny parowe i gazowe, IMP Ossolineum,<br><br>Kosowski K. ed., Steam and Gas Turbines, Alstom, ISBN 978-83-925959-3-9, 2007 |                               |
|  | Supplementary literature                                 | -  |                               |
|  | eResources addresses                                     | Adresy na platformie eNauczanie:   |                               |
| Example issues/<br>example questions/<br>tasks being completed |  |  |                               |
| Work placement   | Not applicable   |  |                               |