



## Subject card

|   |   |  |                 |                                     |   |            |     |
|---|---|--|-----------------|-------------------------------------|---|------------|-----|
| Subject name and code                       | , PG_00058896   |  |                 |                                     |   |            |     |
| Field of study                              | Mechanical Engineering  |  |                 |                                     |   |            |     |
| Date of commencement of studies             | February 2022   | Academic year of realisation of subject                  |                 |                                     | 2022/2023   |            |     |
| Education level                             | second-cycle studies  | Subject group  |                 |                                     |   |            |     |
| Mode of study                               | Part-time studies   | Mode of delivery   |                 |                                     | at the university   |            |     |
| Year of study                               | 2   | Language of instruction                                  |                 |                                     | Polish  |            |     |
| Semester of study                           | 3   | ECTS credits   |                 |                                     | 4.0   |            |     |
| Learning profile                            | general academic profile  | Assessment form  |                 |                                     | assessment  |            |     |
| Conducting unit                             | Department of Mechanics and Mechatronics -> Faculty of Mechanical Engineering and Ship Technology   |  |                 |                                     |   |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor  |  |                 |                                     |   |            |     |
|   | Teachers  |  |                 |                                     |   |            |     |
| Lesson types and methods of instruction     | Lesson type   | Lecture  | Tutorial        | Laboratory                          | Project   | Seminar    | SUM |
|   | Number of study hours   | 20.0   | 0.0             | 0.0                                 | 10.0  | 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   |                 | 0.0                                 |   | 0.0        | 30  |
| Subject objectives                          | Learning the principles of operation and diagnosis of hydraulic systems   |  |                 |                                     |   |            |     |
| Learning outcomes                           | Course outcome  |  | Subject outcome |                                     | Method of verification  |            |     |
|   | [K7_W11] possesses organized knowledge useful in understanding ex-technical conditioning connected with performing the profession of an engineer and taking it into consideration in engineering practice; possesses well-established knowledge within the range of intellectual property, management and organization of manufacturing processes, including the management and life-cycle of a product |  |                 |                                     | [SW1] Assessment of factual knowledge<br>[SW3] Assessment of knowledge contained in written work and projects   |            |     |
|   | [K7_U01] is able to acquire information from specialist literary sources and other sources regarding the construction and operation of machines and related disciplines in Polish and in a foreign language, is able to conduct a self-learning process, is able to synthesize the information, form conclusions and justify opinions   |  |                 |                                     | [SU1] Assessment of task fulfilment<br>[SU2] Assessment of ability to analyse information<br>[SU4] Assessment of ability to use methods and tools<br>[SU5] Assessment of ability to present the results of task |            |     |
|   | [K7_W06] possesses organized, profound knowledge necessary for designing and optimization of complex technological processes, modelling and calculations using numerical methods, knows modern manufacturing methods and tools for designing manufacturing processes of machines, devices, their elements and components  |  |                 |                                     | [SW1] Assessment of factual knowledge<br>[SW3] Assessment of knowledge contained in written work and projects   |            |     |

| Subject contents   | <p>1. Measurements in the laboratory of hydraulics and pneumatic systems for data collection and measurement.</p> <p>2. Wear of the machinery components and monitoring of oil.</p> <p>3. Preparation of the hydraulic system to operate.</p> <p>4. Methods for determining of pressure losses in the internal channels of pump and hydraulic and pneumatic motor.</p> <p>5. Determination of the theoretical displacement of hydraulic and pneumatic machine.</p> <p>6. Methods of testing the motor and the pump at a constant low speed. Starting torque.</p> <p>7. Methods of description of the losses in hydraulic and pneumatic motors.</p> <p>8. Methods of testing of the hydraulic and pneumatic systems components at low ambient temperatures.</p> <p>9. Methodology of the testing of the seals in the reciprocating and rotary motion.</p> <p>10. Methods of dewatering oil. Methods for determining the amount of water in oil.</p> |   |  |                          |                   |                               |         |       |       |         |       |       |
|--|--|---|--|--------------------------|-------------------|-------------------------------|---------|-------|-------|---------|-------|-------|
| Prerequisites and co-requisites                          | Basic knowledge of hydraulics and pneumatics.  |   |  |                          |                   |                               |         |       |       |         |       |       |
| Assessment methods and criteria                          | <table border="1" data-bbox="448 987 1487 1093"> <thead> <tr> <th data-bbox="448 987 794 1025">Subject passing criteria</th> <th data-bbox="794 987 1141 1025">Passing threshold</th> <th data-bbox="1141 987 1487 1025">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 1025 794 1055">Project</td> <td data-bbox="794 1025 1141 1055">56.0%</td> <td data-bbox="1141 1025 1487 1055">25.0%</td> </tr> <tr> <td data-bbox="448 1055 794 1093">Lecture</td> <td data-bbox="794 1055 1141 1093">56.0%</td> <td data-bbox="1141 1055 1487 1093">75.0%</td> </tr> </tbody> </table>   |   |  | Subject passing criteria | Passing threshold | Percentage of the final grade | Project | 56.0% | 25.0% | Lecture | 56.0% | 75.0% |
| Subject passing criteria                                 | Passing threshold  | Percentage of the final grade   |  |                          |                   |                               |         |       |       |         |       |       |
| Project  | 56.0%  | 25.0%   |  |                          |                   |                               |         |       |       |         |       |       |
| Lecture  | 56.0%  | 75.0%   |  |                          |                   |                               |         |       |       |         |       |       |
| Recommended reading                                      | Basic literature   | <p>1. P. Śliwiński, Satelitowe maszyny waporowe. Wyd. PG, 2016.</p> <p>2. A. Osiecki, Hydrostatyczny napęd maszyn, WNT, W-wa 1998.</p> <p>3. A. Balawender and others, Laboratorium napędów hydraulicznych. Part 1. Podstawy hydrauliki. Wyd. IMP PAN, Gdańsk 1996.</p> <p>4. S. Stryczek, Napęd hydrostatyczny, Volume I i II, WNT, W-wa 1997.</p> |  |                          |                   |                               |         |       |       |         |       |       |
|  | Supplementary literature   | There is no requirement.  |  |                          |                   |                               |         |       |       |         |       |       |
|  | eResources addresses   |   |  |                          |                   |                               |         |       |       |         |       |       |
| Example issues/ example questions/ tasks being completed | Given during the course  |   |  |                          |                   |                               |         |       |       |         |       |       |
| Work placement   | Not applicable   |   |  |                          |                   |                               |         |       |       |         |       |       |