



Subject card

|   |   |  |  |                                     |   |            |     |
|---|---|--|--|-------------------------------------|---|------------|-----|
| Subject name and code                       | Pneumatic Systems Design, PG_00058897   |  |  |                                     |   |            |     |
| Field of study                              | Mechanical Engineering  |  |  |                                     |   |            |     |
| Date of commencement of studies             | February 2023   | Academic year of realisation of subject                  |  |                                     | 2023/2024   |            |     |
| 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  |  | dr inż. Piotr Patrosz  |                                     |   |            |     |
|   | Teachers  |  |  |                                     |   |            |     |
| Lesson types and methods of instruction     | Lesson type   | Lecture  | Tutorial   | Laboratory                          | Project   | Seminar    | SUM |
|   | Number of study hours   | 18.0   | 0.0  | 0.0                                 | 9.0   | 0.0        | 27  |
|   | 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   | 27   |  | 0.0                                 |   | 0.0        | 27  |
| Subject objectives                          | Presentation of various design methods of pneumatic drive and control 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 |  | The student is able to make a project in accordance with engineering practice. During its implementation, it takes into account the minimization of costs as well as the availability and rational use of production resources |                                     | [SW3] Assessment of knowledge contained in written work and projects<br>[SW1] Assessment of factual knowledge |            |     |
|   | [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   |  | The student is able to independently find and use the information necessary to carry out the design process  |                                     | [SU4] Assessment of ability to use methods and tools<br>[SU1] Assessment of task fulfilment                   |            |     |
|   | [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  |  | The student knows how to use the information presented in the lecture  |                                     | [SW3] Assessment of knowledge contained in written work and projects<br>[SW1] Assessment of factual knowledge |            |     |

| Subject contents   | 1. Properties of compressed air<br><br>2. Elements of pneumatic systems<br><br>3. Basic pneumatic systems<br><br>4. Methods of design: intuitive, algorithmic, analytic<br><br>5. Calculations of pneumatic systems<br><br>6. Design of chosen systems  |                               |  |                          |  |                               |                          |   |       |                      |                                  |       |
|--|---|-------------------------------|--|--------------------------|--|-------------------------------|--------------------------|---|-------|----------------------|----------------------------------|-------|
| Prerequisites and co-requisites                                | Pass of "Basic principles of hydraulics and pneumatics" at I stage studies  |                               |  |                          |  |                               |                          |   |       |                      |                                  |       |
| Assessment methods and criteria                                | <table border="1" data-bbox="448 620 1497 725"> <thead> <tr> <th data-bbox="448 620 794 656">Subject passing criteria</th> <th data-bbox="794 620 1141 656">Passing threshold</th> <th data-bbox="1141 620 1497 656">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 656 794 687">Lecture pass</td> <td data-bbox="794 656 1141 687">56.0%</td> <td data-bbox="1141 656 1497 687">70.0%</td> </tr> <tr> <td data-bbox="448 687 794 725">Laboratory pass</td> <td data-bbox="794 687 1141 725">56.0%</td> <td data-bbox="1141 687 1497 725">30.0%</td> </tr> </tbody> </table>   |                               |  | Subject passing criteria | Passing threshold                            | Percentage of the final grade | Lecture pass             | 56.0%   | 70.0% | Laboratory pass      | 56.0%                            | 30.0% |
| Subject passing criteria                                       | Passing threshold   | Percentage of the final grade |  |                          |  |                               |                          |   |       |                      |                                  |       |
| Lecture pass   | 56.0%   | 70.0%                         |  |                          |  |                               |                          |   |       |                      |                                  |       |
| Laboratory pass  | 56.0%   | 30.0%                         |  |                          |  |                               |                          |   |       |                      |                                  |       |
| Recommended reading  | <table border="1" data-bbox="448 732 1497 987"> <tbody> <tr> <td data-bbox="448 732 794 763">Basic literature</td> <td colspan="2" data-bbox="794 732 1497 763">Napęd i sterowanie pneumatyczne. W. Szenajch</td> </tr> <tr> <td data-bbox="448 763 794 947">Supplementary literature</td> <td colspan="2" data-bbox="794 763 1497 947"> Pneumatyka. Elementy i układy. Ł. Węsierski<br/><br/> Sterowanie pneumatyczne. Ćwiczenia laboratoryjne. J. Niegoda, W. Pomierski </td> </tr> <tr> <td data-bbox="448 947 794 987">eResources addresses</td> <td colspan="2" data-bbox="794 947 1497 987">Adresy na platformie eNauczanie:</td> </tr> </tbody> </table> |                               |  | Basic literature         | Napęd i sterowanie pneumatyczne. W. Szenajch |                               | Supplementary literature | Pneumatyka. Elementy i układy. Ł. Węsierski<br><br>Sterowanie pneumatyczne. Ćwiczenia laboratoryjne. J. Niegoda, W. Pomierski |       | eResources addresses | Adresy na platformie eNauczanie: |       |
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| eResources addresses   | Adresy na platformie eNauczanie:  |                               |  |                          |  |                               |                          |   |       |                      |                                  |       |
| Example issues/<br>example questions/<br>tasks being completed | Design of energy efficient pneumatic system with safe control<br><br>Design of sequential pneumatic system with use of algorithmic method   |                               |  |                          |  |                               |                          |   |       |                      |                                  |       |
| Work placement   | Not applicable  |                               |  |                          |  |                               |                          |   |       |                      |                                  |       |