



Subject card

|                                             |                                                                                                                                                                                                                               |                                                                                                                                                                                                                              |                                     |            |                                                                      |         |     |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|------------|----------------------------------------------------------------------|---------|-----|
| Subject name and code                       | Economic environment, PG_00062731                                                                                                                                                                                             |                                                                                                                                                                                                                              |                                     |            |                                                                      |         |     |
| Field of study                              | Technologies for Industry 5.0                                                                                                                                                                                                 |                                                                                                                                                                                                                              |                                     |            |                                                                      |         |     |
| Date of commencement of studies             | October 2026                                                                                                                                                                                                                  | Academic year of realisation of subject                                                                                                                                                                                      |                                     |            | 2027/2028                                                            |         |     |
| Education level                             | first-cycle studies                                                                                                                                                                                                           | Subject group                                                                                                                                                                                                                |                                     |            | Humanistic-social subject group                                      |         |     |
| Mode of study                               | Full-time studies                                                                                                                                                                                                             | Mode of delivery                                                                                                                                                                                                             |                                     |            | at the university                                                    |         |     |
| Year of study                               | 2                                                                                                                                                                                                                             | Language of instruction                                                                                                                                                                                                      |                                     |            | Polish                                                               |         |     |
| Semester of study                           | 3                                                                                                                                                                                                                             | ECTS credits                                                                                                                                                                                                                 |                                     |            | 2.0                                                                  |         |     |
| Learning profile                            | general academic profile                                                                                                                                                                                                      | Assessment form                                                                                                                                                                                                              |                                     |            | assessment                                                           |         |     |
| Conducting unit                             | Division of Theoretical Physics and Quantum Informaton -> Institute of Physics and Applied Computer Science -> Faculty of Applied Physics and Mathematics -> Faculties of Gdańsk University of Technology                     |                                                                                                                                                                                                                              |                                     |            |                                                                      |         |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                                                            | dr inż. Patryk Jasik                                                                                                                                                                                                         |                                     |            |                                                                      |         |     |
|                                             | Teachers                                                                                                                                                                                                                      |                                                                                                                                                                                                                              |                                     |            |                                                                      |         |     |
| Lesson types                                | Lesson type                                                                                                                                                                                                                   | Lecture                                                                                                                                                                                                                      | Tutorial                            | Laboratory | Project                                                              | Seminar | SUM |
|                                             | Number of study hours                                                                                                                                                                                                         | 30.0                                                                                                                                                                                                                         | 0.0                                 | 0.0        | 0.0                                                                  | 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                                                                                                                                                                                                                           | 2.0                                 |            | 18.0                                                                 | 50      |     |
| Subject objectives                          | Gaining knowledge in the use of cutting-edge technologies in Industry 5.0.                                                                                                                                                    |                                                                                                                                                                                                                              |                                     |            |                                                                      |         |     |
| Learning outcomes                           | Course outcome                                                                                                                                                                                                                | Subject outcome                                                                                                                                                                                                              |                                     |            | Method of verification                                               |         |     |
|                                             | [K6_W04] demonstrates knowledge necessary to understand non-technical (legal, economic, ethical, environmental) conditions of engineering activities in the scope directly or indirectly related to the industrial revolution | The student demonstrates the knowledge necessary to understand non-technical (legal, economic, ethical, environmental) conditions of engineering activities directly or indirectly related to the Industrial Revolution 5.0. |                                     |            | [SW3] Assessment of knowledge contained in written work and projects |         |     |
|                                             | [K6_W03] demonstrates knowledge on materials used in industrial technologies, their structure and fabrication, knows the principles of conducting research, analyzing it and creating technical documentation                 | The student demonstrates knowledge of technologies used in Industry 5.0, understands the principles of conducting research, performing analysis, and creating technical documentation.                                       |                                     |            | [SW3] Assessment of knowledge contained in written work and projects |         |     |

| Subject contents                                                         | <p>Course content – lecture<br/> <b>Discussion on the Definition of Industry 5.0</b></p> <p>Industry 5.0 is the next stage of the industrial revolution, focusing on harmonious collaboration between humans and machines, emphasizing product personalization, sustainability, and the integration of advanced technologies with elements of human creativity and innovation.</p> <p>Examples of Technologies Used in Industry 5.0</p> <ol style="list-style-type: none"> <li>1. Internet of Things (IoT)</li> <li>2. Artificial Intelligence (AI)</li> <li>3. Collaborative Robotics (Cobots)</li> <li>4. Blockchain</li> <li>5. 3D Printing</li> <li>6. Augmented and Virtual Reality (AR/VR)</li> <li>7. Big Data and Advanced Data Analytics</li> <li>8. 5G Networks</li> <li>9. Sustainable Development Technologies</li> </ol> <p>Course "Economic Environment"</p> <p>As part of the course "Economic Environment," students will explore the broad economic and business context in which Industry 5.0 technologies operate. Students will have the opportunity to participate in meetings with representatives from corporations, companies, and small and medium-sized enterprises that implement and utilize Industry 5.0 technologies. These meetings will take place both at the university and through study visits to these enterprises, allowing students to directly engage with the practical applications of the discussed technologies and understand their impact on the modern economic environment.</p> |                               |  |                          |                                                                                                         |                               |                                                                          |                                                                                                                                                                                                         |        |                      |  |  |
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| Prerequisites and co-requisites                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                               |  |                          |                                                                                                         |                               |                                                                          |                                                                                                                                                                                                         |        |                      |  |  |
| Assessment methods and criteria                                          | <table border="1" data-bbox="448 949 1487 1066"> <thead> <tr> <th data-bbox="448 949 798 981">Subject passing criteria</th> <th data-bbox="802 949 1142 981">Passing threshold</th> <th data-bbox="1147 949 1487 981">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 987 798 1066">Report on the Use of Industry 5.0 Technologies in a Selected Enterprise.</td> <td data-bbox="802 987 1142 1066">60.0%</td> <td data-bbox="1147 987 1487 1066">100.0%</td> </tr> </tbody> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                               |  | Subject passing criteria | Passing threshold                                                                                       | Percentage of the final grade | Report on the Use of Industry 5.0 Technologies in a Selected Enterprise. | 60.0%                                                                                                                                                                                                   | 100.0% |                      |  |  |
| Subject passing criteria                                                 | Passing threshold                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Percentage of the final grade |  |                          |                                                                                                         |                               |                                                                          |                                                                                                                                                                                                         |        |                      |  |  |
| Report on the Use of Industry 5.0 Technologies in a Selected Enterprise. | 60.0%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 100.0%                        |  |                          |                                                                                                         |                               |                                                                          |                                                                                                                                                                                                         |        |                      |  |  |
| Recommended reading                                                      | <table border="1" data-bbox="448 1072 1487 1444"> <tbody> <tr> <td data-bbox="448 1072 798 1252">Basic literature</td> <td colspan="2" data-bbox="802 1072 1487 1252">Armando Martin, Industry 5.0. Introductory guide to the fifth industrial revolution, Editoriale Delfino</td> </tr> <tr> <td data-bbox="448 1258 798 1415">Supplementary literature</td> <td colspan="2" data-bbox="802 1258 1487 1415">Kenneth Cukier, Victor Mayer-Schonberger, "Big Data :A Revolution That Will Transform How We Live, Work, and Think", Eamon Dolan/Houghton Mifflin Harcourt<br/><br/>Eamon Dolan/Houghton Mifflin Harcourt</td> </tr> <tr> <td data-bbox="448 1422 798 1444">eResources addresses</td> <td colspan="2" data-bbox="802 1422 1487 1444"></td> </tr> </tbody> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                               |  | Basic literature         | Armando Martin, Industry 5.0. Introductory guide to the fifth industrial revolution, Editoriale Delfino |                               | Supplementary literature                                                 | Kenneth Cukier, Victor Mayer-Schonberger, "Big Data :A Revolution That Will Transform How We Live, Work, and Think", Eamon Dolan/Houghton Mifflin Harcourt<br><br>Eamon Dolan/Houghton Mifflin Harcourt |        | eResources addresses |  |  |
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| <p>Example issues/<br/>example questions/<br/>tasks being completed</p> | <p>Guidelines for Creating a Report on the Use of Industry 5.0 Technologies in a Selected Enterprise</p> <ol style="list-style-type: none"> <li>1. <ul style="list-style-type: none"> <li><b>Introduction</b></li> <li>• <b>Description of the Enterprise:</b> Provide a brief description of the selected enterprise, including its history, main products or services, and the sector in which it operates.</li> <li>• <b>Purpose of the Report:</b> Explain the purpose of the report, which is to analyze the use of Industry 5.0 technologies in the enterprise.</li> </ul> </li> <li>2. <ul style="list-style-type: none"> <li><b>Overview of Industry 5.0 Technologies in the Enterprise</b></li> <li>• <b>Description of Implemented Technologies:</b> Identify and describe the Industry 5.0 technologies implemented in the enterprise.</li> <li>• <b>Purpose of Implementation:</b> Explain the goals the enterprise aimed to achieve by implementing these technologies (e.g., increased efficiency, improved product quality, cost reduction, sustainable development).</li> </ul> </li> <li>3. <ul style="list-style-type: none"> <li><b>Analysis of the Impact of Technologies on the Enterprise's Operations</b></li> <li>• <b>Impact on Business Processes:</b> Analyze how the implemented technologies have affected key business processes in the enterprise (e.g., production, logistics, resource management).</li> <li>• <b>Benefits and Savings:</b> Determine the financial and operational benefits and savings the enterprise has achieved through the use of Industry 5.0 technologies.</li> <li>• <b>Impact on Employees:</b> Investigate how these technologies have impacted employees, their roles and skills, and the organizational culture.</li> </ul> </li> <li>4. <ul style="list-style-type: none"> <li><b>Challenges and Barriers</b></li> <li>• <b>Identification of Problems:</b> Identify the main challenges and barriers the enterprise faced during the implementation of Industry 5.0 technologies (e.g., implementation costs, lack of skills, employee resistance).</li> <li>• <b>Mitigation Strategies:</b> Describe the strategies and actions taken by the enterprise to overcome these challenges and barriers.</li> </ul> </li> <li>5. <ul style="list-style-type: none"> <li><b>Conclusions and Summary:</b> Present the key findings from the analysis, highlighting the main benefits and challenges associated with the use of Industry 5.0 technologies in the enterprise.</li> </ul> </li> </ol> |
| <p>Practical activities within the subject</p>                          | <p>Not applicable</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

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