



## Subject card

|   |  |  |   |                                     |  |            |     |
|---|--|--|---|-------------------------------------|--|------------|-----|
| Subject name and code                       | , PG_00061833  |  |   |                                     |  |            |     |
| Field of study                              | Management and Production Engineering  |  |   |                                     |  |            |     |
| Date of commencement of studies             | February 2024  |  | Academic year of realisation of subject |                                     | 2024/2025  |            |     |
| Education level                             | second-cycle studies   |  | 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                            |                                     | 4.0  |            |     |
| Learning profile                            | general academic profile   |  | Assessment form                         |                                     | assessment   |            |     |
| Conducting unit                             | Zakład Materiałoznawstwa I Technologii Materiałowych -> Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology   |  |   |                                     |  |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor   |  | prof. dr hab. inż. Dionizy Czekaj       |                                     |  |            |     |
|   | Teachers   |  |   |                                     |  |            |     |
| Lesson types and methods of instruction     | Lesson type  | Lecture  | Tutorial                                | Laboratory                          | Project  | Seminar    | SUM |
|   | Number of study hours  | 30.0   | 0.0                                     | 15.0                                | 0.0  | 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   |   | 0.0                                 |  | 0.0        | 45  |
| Subject objectives                          | To introduce students with the mathematical foundations and selected applications of game theory, especially for solving conflict situations or cooperation.   |  |   |                                     |  |            |     |
| Learning outcomes                           | Course outcome   | Subject outcome  |   |                                     | Method of verification                               |            |     |
|   | [K7_U01] can obtain information from literature, databases and others sources, also in English or another foreign language recognized as the language of international communication in a given engineering discipline; is able to integrate the obtained information, interpret it, as well as draw conclusions and formulate and justify opinions. | The student is able to obtain information from literature, databases and other sources, also in English. |   |                                     | [SU4] Assessment of ability to use methods and tools |            |     |
|   | [K7_K01] is aware of the need to expand knowledge and verify the methods of solving problems by consulting experts   | The student understands the need to expand their knowledge.  |   |                                     | [SK2] Assessment of progress of work                 |            |     |
|   | [K7_K02] is aware of the importance and understanding of non-technical aspects and effects of engineering activities, including its impact on the environment, and the related responsibility for decisions made demonstrates knowledge of actions to reduce risk and anticipate the social impact of engineering and manufacturing activities       | The student is aware of the non-technical aspects and effects of engineering activities.                 |   |                                     | [SK2] Assessment of progress of work                 |            |     |
| Subject contents                            | Introduction. Game examples. Nominal form games and dominated strategies. Nash equilibrium. Equilibrium in mixed strategies. Extensive character of the game. Repeated games. Evolution Games. Cooperative games. Elements of game learning theory.  |  |   |                                     |  |            |     |
| Prerequisites and co-requisites             |  |  |   |                                     |  |            |     |
| Assessment methods and criteria             | Subject passing criteria   |  | Passing threshold                       |                                     | Percentage of the final grade                        |            |     |
|   | Final test   |  | 51.0%                                   |                                     | 50.0%  |            |     |
|   | Laboratory classes   |  | 100.0%                                  |                                     | 50.0%  |            |     |

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| Recommended reading  | Basic literature  | <ol style="list-style-type: none"> <li>1. T. Płatkowski, Wstęp do Teorii Gier, Uniwersytet Warszawski, 2012.</li> <li>2. M. Malawski, A. Wieczorek, H. Sosnowska. Konkurencja i kooperacja. Teoria gier w ekonomii i naukach społecznych. Wydawnictwo Naukowe PWN, 1997.</li> <li>3. M. Ramsza. Elementy modelowania ekonomicznego opartego na teorii uczenia się w grach populacyjnych. Oficyna Wydawnicza SGH Warszawa, 2010.</li> <li>4. R. Laraki, J. Renault, S.Sorin, Teoria Gier. Podstawy matematyczne, Wydawnictwo Naukowe PWN</li> </ol> |
|  | Supplementary literature  | <ol style="list-style-type: none"> <li>1. P.D. Straffin, Teoria gier. Warszawa: Wydawnictwo Naukowe Scholar, 2004.</li> <li>2. K. Binmore, Teoria gier, Wydawnictwo Uniwersytetu Łódzkiego</li> <li>3. P. Kilber, Wprowadzenie do teorii gier, Uniwersytet Ekonomiczny w Poznaniu</li> </ol>   |
|  | eResources addresses  | Adresy na platformie eNauczenie:   |
| Example issues/<br>example questions/<br>tasks being completed | <ol style="list-style-type: none"> <li>1. Classical economic approaches in game theory</li> <li>2. Application of game theory in management</li> <li>3. Player added value</li> </ol> |  |
| Work placement   | Not applicable  |  |