



## Subject card

|   |   |  |   |                                     |         |  |     |
|---|---|--|---|-------------------------------------|---------|--|-----|
| Subject name and code                       | Planning and production control, PG_00059503  |  |   |                                     |         |  |     |
| 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                           |                                     |         | 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                 |                                     |         | Polish   |     |
| Semester of study                           | 2   |  | ECTS credits                            |                                     |         | 4.0  |     |
| Learning profile                            | general academic profile  |  | Assessment form                         |                                     |         | exam   |     |
| Conducting unit                             | Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology  |  |   |                                     |         |  |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor  |  | dr inż. Aleksandra Wiśniewska           |                                     |         |  |     |
|   | Teachers  |  |   |                                     |         |  |     |
| Lesson types and methods of instruction     | Lesson type   | Lecture  | Tutorial                                | Laboratory                          | Project | Seminar  | SUM |
|   | Number of study hours   | 30.0   | 15.0                                    | 0.0                                 | 15.0    | 0.0  | 60  |
|   | 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   | 60   |   | 6.0                                 |         | 34.0   | 100 |
| Subject objectives                          | The program of lectures and table and laboratory exercises is to equip the student with advanced knowledge of the application of production management models at the tactical and operational level, from issues related to assortment and quantity planning, through resource planning in conditions of dependent and independent demand, to issues related to maintenance machine park aimed at assessing and improving the efficiency of machines and devices. |  |   |                                     |         |  |     |

| Learning outcomes | Course outcome   | Subject outcome   | Method of verification   |
|-------------------|--|---|--|
|                   | [K7_K03] can think and act in a creative and entrepreneurial manner  | The student organizes his own and team work, choosing means and methods of team role management, task allocation management and change management. Knows and uses activation methods and tools that foster creativity and innovation.                                     | [SK5] Assessment of ability to solve problems that arise in practice<br>[SK4] Assessment of communication skills, including language correctness<br>[SK3] Assessment of ability to organize work<br>[SK1] Assessment of group work skills        |
|                   | [K7_U05] is able - in accordance with a given specification, taking into account non-technical aspects - to design a complex device, object, system or process related to the studied engineering discipline, and to implement this project - at least in part - using appropriate methods, techniques and tools, if necessary, adapting to it the purpose of existing or developing new tools | The student is able to design the arrangement of workstations in the production structure of the subject specialization and design the production department using methods and tools commonly used for this purpose and modifications created for non-standard solutions. | [SU1] Assessment of task fulfilment<br>[SU3] Assessment of ability to use knowledge gained from the subject<br>[SU4] Assessment of ability to use methods and tools  |
|                   | [K7_W02] has extended knowledge covering key issues characterizing production processes  | The student identifies, selects analytical methods, analyzes, determines relationships, formulates conclusions and recommendations for the management and control of production processes.  | [SW3] Assessment of knowledge contained in written work and projects<br>[SW1] Assessment of factual knowledge  |
|                   | [K7_U09] is able to define the directions of further learning and implement the process of self-education  | The student is able to analyze the effectiveness of the methods of solving problems chosen by him/her. Is able to identify shortages of knowledge, skills and experience, and then set development directions based on the principles of continuous improvement.          | [SU3] Assessment of ability to use knowledge gained from the subject<br>[SU5] Assessment of ability to present the results of task<br>[SU4] Assessment of ability to use methods and tools<br>[SU2] Assessment of ability to analyse information |

| Subject contents                      | <p><b>Lecture content:</b></p> <p>The essence of production and service management. Product and its design, quality, reliability, construction, demand forecasting. The concept of a production system. Structure, forms of organization and management of systems. Production process, arrangement of production equipment, production flow control (simulation and analytical methods). Designing production systems, production control. Planning material needs (MRP system) and production resources (MRP II). Synchronization of material flow according to the JIT concept. Production flow control (kanban system), lean manufacturing (LP), narrow-section management (OPT) and human resources. Computer-aided production and service management.</p> <p><b>Exercise content:</b></p> <ol style="list-style-type: none"> <li>1. Production programs of machine parts and assembly units forming complex products.</li> <li>2. Calculation of the production lot size.</li> <li>3. Calculation of the technological period for the production of batches of simple and complex products.</li> <li>4. Calculation of in-process inventory and material needs</li> <li>5. Equipment efficiency control - system approach.</li> <li>6. Optimization of the company's production program - linear and aggregate programming models.</li> <li>7. Project planning using network methods.</li> </ol> <p><b>Design content:</b></p> <ul style="list-style-type: none"> <li>- design of the production process;</li> <li>- design of the production station;</li> <li>- design of the production line.</li> </ul> <p>As part of the project classes, the student is to acquire skills, among others: designing the distribution of workstations in the production structure of the subject specialization and designing the production department using the index method for calculations.</p> |                               |                   |                               |                                       |       |       |                                   |       |       |                                 |       |       |
|---------------------------------------|---|-------------------------------|-------------------|-------------------------------|---------------------------------------|-------|-------|-----------------------------------|-------|-------|---------------------------------|-------|-------|
| Prerequisites and co-requisites       | <p>Methods and techniques of production improvement</p> <p>Innovations in production engineering</p> <p>Quality management systems</p> <p>Fundamentals of production and service management</p>   |                               |                   |                               |                                       |       |       |                                   |       |       |                                 |       |       |
| Assessment methods and criteria       | <table border="1"> <thead> <tr> <th>Subject passing criteria</th> <th>Passing threshold</th> <th>Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>Final evaluation of two lecture tests</td> <td>60.0%</td> <td>30.0%</td> </tr> <tr> <td>Final evaluation of the exercises</td> <td>60.0%</td> <td>35.0%</td> </tr> <tr> <td>Final evaluation of the project</td> <td>60.0%</td> <td>35.0%</td> </tr> </tbody> </table>  | Subject passing criteria      | Passing threshold | Percentage of the final grade | Final evaluation of two lecture tests | 60.0% | 30.0% | Final evaluation of the exercises | 60.0% | 35.0% | Final evaluation of the project | 60.0% | 35.0% |
| Subject passing criteria              | Passing threshold   | Percentage of the final grade |                   |                               |                                       |       |       |                                   |       |       |                                 |       |       |
| Final evaluation of two lecture tests | 60.0%   | 30.0%                         |                   |                               |                                       |       |       |                                   |       |       |                                 |       |       |
| Final evaluation of the exercises     | 60.0%   | 35.0%                         |                   |                               |                                       |       |       |                                   |       |       |                                 |       |       |
| Final evaluation of the project       | 60.0%   | 35.0%                         |                   |                               |                                       |       |       |                                   |       |       |                                 |       |       |

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| Recommended reading  | Basic literature   | <b>Literatura:</b><br><br>1. Pająk Edward , Klimkiewicz Marek , Kosieradzka Anna, Zarządzanie produkcją i usługami, PWE Polskie Wydawnictwo Ekonomiczne 2014<br><br>2. Pająk Edward, Zarządzanie produkcją. Produkt, technologia, organizacja,. Wydawnictwo Naukowe PWN 2021<br><br>3. Inżynieria produkcji. Kompendium wiedzy, praca zbiorowa, PWE Polskie Wydawnictwo Ekonomiczne 2017<br><br>4. Janusz Mleczek, Sławomir Kłos, Zbigniew Banaszak, praca zbiorowa. Zintegrowane systemy zarządzania. PWE 2016<br><br>5. Durlik I.: Inżynieria zarządzania. cz I i II, Agencja Wydawnicza PLACET, Warszawa 2001.<br><br>6. Muhlemann A.P. i inni: Zarządzanie. Produkcja i usługi. PWN, Warszawa 2001.<br><br>7. Koźmiński A., Piotrowski A.: Zarządzanie - teoria i praktyka. PWN, Warszawa 2001<br><br>8. Brzeziński M.: Organizacja i sterowanie produkcją, Placet, Warszawa 2002<br><br>9. Chlebus E.: Techniki komputerowe CAX w inżynierii produkcji, WNT, Warszawa 2001<br><br>10. Szatkowski K. Nowoczesne zarządzanie produkcją, Wydawnictwa Naukowe PWN 2021<br><br>11. Kulińska E., Busławski A., Zarządzanie procesem produkcji, Difin 2019 |
|  | Supplementary literature   | Provided during classes and eLearning resources  |
|  | eResources addresses   | Adresy na platformie eNauczanie:   |
| Example issues/<br>example questions/<br>tasks being completed | 1. The essence of production and service management.<br><br>2. The product and its design.<br><br>3. Production system: structure, forms of organization and management.<br><br>4. Production process: arrangement of production equipment and production flow control.<br><br>5. Planning needs and material resources and synchronizing the flow of materials according to the JIT concept.<br><br>6. Controlling the production flow according to the Kanban concept.<br><br>7. Computer-aided production and service management. |  |
| Work placement   | Not applicable   |  |