GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Computer-aided production control, PG_00055255
Field of study	Management and Production Engineering

Date of commencement of studies	October 2021	Academic year of realisation of subject	2023/2024
Education level	first-cycle studies	Subject group	Optional subject group 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	3	Language of instruction	Polish
Semester of study	6	ECTS credits	5.0
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. Sławomir Szymański
	Teachers	dr inż. Sławomir Szymański dr inż. Bogdan Ścibiorski

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	15.0	15.0	0.0	60
	E-learning hours included: 0.0						
	Address on the e-learning platform: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=10366						

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	59.0	125

Subject objectives	The aim of the course is to provide with advanced techniques of production planning and control. Possibilities of sequencing and scheduling of orders in in computer integrated environment.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U04] is able to develop documentation in the area of preparation, implementation and control of production processes in Polish and in a foreign language considered basic for scientific fields, is able to identify and formulate the basic objectives of quality management in the product life cycle, is able to use information and communication techniques appropriate to the implementation of tasks typical in engineering activities including preparation, production and supervision of the manufacturing process	The student prepares necessary documentation in production planning and control.	[SU4] Assessment of ability to use methods and tools
	[K6_U09] can use analytical techniques as well as computer simulation and numerical analysis methods in solving specific problems in the field of production engineering, is able to carry out simple engineering tasks related to the production of typical machine parts using widely understood techniques and computer tools, is able to select and apply appropriate methods of project planning and control courses with the use of computer aided means	The student uses basis computer systems to obtain relevant data about the production planning and control process.	[SU3] Assessment of ability to use knowledge gained from the subject
	[K6_W04] has basic knowledge in the field of automation, robotics and control of production processes, has elementary knowledge of electrical and electronic applications in the production system, has basic knowledge of thermodynamics and fluid mechanics as well as the selection and design of hydraulic and pneumatic systems	The student knows basic issues in production planning and control.	[SW1] Assessment of factual knowledge
	[K6_K01] feels the need for self-realization by learning throughout life, is looking for modern and innovative solutions in their actions, is able to think creatively and act in an entrepreneurial way	The student is able to analyze the structure of an enterprise and prepare a set of data necessary in the process of production planning and control.	[SK5] Assessment of ability to solve problems that arise in practice
	[K6_W12] has detailed, theoretically founded knowledge of methods and techniques used in production quality control processes, statistical process control, modern techniques and measurement systems in quality assurance and information techniques in production systems	The student has theoretically grounded knowledge of the basics of production planning and control as well as computer systems used in this field.	[SW3] Assessment of knowledge contained in written work and projects
	[K6_U03] is able to communicate using various techniques in the professional environment and other environments, has language skills enabling free communication in the field of technical sciences related thematically to management and production engineering	The student is able to communicate in a working environment using the terminology applied in the production planning and control process.	[SU1] Assessment of task fulfilment

| Subject contents | LECTURE Computer integrated production planning and control systems. Technical and economic aspects of production control, production flow control essence, the basic principles of control, control norms, scheduling and load production stations, balancing tasks on production capacity, inter-cellular methods of production flow control, intracellular methods of production flow control, documentation associated with the production flow control, record and control of production flow. Other production control techniques. Trends in production planning and control.

LABORATORY Products: product attributes, routing options, resources, set-up and operation times, operation attributes. Resources data: resources, secondary constraints, resources groups.

PROJECT: Entering the orders. batching methods. calendar states and shift patterns. Sequencing the orders. Standard dispatching rules. Standard algorithmic rules. Schedule analysis. Reports. Gantt Chart. Order Trace Chart. Constraints plots. |
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| Prerequisites and co-requisites | |

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory	60.0%	25.0%
	Project	60.0%	25.0%
	Practical excersise	60.0%	25.0%
	Writtrn Exam	60.0%	25.0%

Recommended reading	Basic literature	1. Anil Mital, Anoop Desai, Anand Subramanian, Aashi Mital: Product development, Butterworth-Heinemann is an inprint Elsevier, 30 Corporate Drive, Suite 400, Burlington MA 01803 USA, 2008.
	Supplementary literature	1. Meyer Kutz, Mechanical Engineers' Handbook -Manufacturing and Management, John Wiley &Sons, INC, Hoboken New Jersey, 2006.
	eResources addresses	Adresy na platformie eNauczanie: Komputerowe wspomaganie sterowania produkcją /W/P/ L/ I.st. ZIP. sem. 06 lato 2023/24 (PG 000) - Moodle ID: 36324 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36324

| Example issues/ example questions/ tasks being completed | 1. Control theory - basic terminology.
2. The company as a cybernetic system.
3. The essence of the production flow control.
4. Hierarchical control systems ..
5. The complexity of the production flow control.
6. The efficiency of the production flow control.
7. Control rules (AI-AIII, BI-BIII).
8. Control standards
9. Scheduling and workload
10. Methodology workload balancing of production capacity,
11. Methods for controlling the flow of intracellular production,
12. Methods for controlling the flow inside the cell for the production,
13. Task switching and principles central distribution works
14. Documentation related to the production flow control
15. Checking the progress of production:
16. Characterize task PPC systems.
17. Explain what the PPC systems available any role.
18. Introduce the basic concepts of production planning and control, the chosen concept discussed in detail.
19. Characterize the essential tasks of PPC systems.
20. Present the data types used in PPC systems and their characteristics.
21. Modern concepts of management and organization of production control, replace - selected to characterize.
22. Identify the main and auxiliary tasks PPC systems, taking into account levels of management.
23. Characterize the resources in the implementation process.
24. Discuss the results of the planning process.
25. Methods to characterize the short-term production planning.
26. Decisions production control systems.
27. Characterize the operational tasks of production control functions.
28. Discuss generations PPC systems.
29. To characterize the functional integration method PPC systems.
30. A split of list management functions of parts and materials, changes in the structure of the product, the types of parts lists.
31. Discuss ways of balancing material consumption and labour. |
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| Work placement | Not applicable |