GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	IT in production and services management, PG_00055042		
Field of study	Management and Production Engineering		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2022/2023
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study 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	1	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Maciej Majewski	
	Teachers	dr hab. inż. Maciej Majewski dr inż. Piotr Sender dr inż. Norbert Piotrowski	

Lesson types and methods of instruction							
	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	30.0	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	2.0	28.0	75

Subject objectives	Getting acquainted with the possibilities of using modern information technology in information systems for industry and services. Acquiring basic knowledge in the area of using modern IT techniques for the exemplary needs of the organization of production and logistics processes as well as automation and robotization of production systems, in line with the idea of the digital industrial revolution, i.e. industry 4.0.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[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 uses the terminology used in the application of information systems for the needs of industry, including the preparation and analysis of data as well as the development of results and reports, using selected modern tools and platforms.	[SW1] Assessment of factual knowledge
	[K6_W03] has knowledge of the design record (the record structure)for the preparation of the manufacturing process documentation and basic knowledge of the implementation and management of production systems, including the principles of designing machine parts and manufacturing technologies using information techniques	The student knows the basic issues of data preparation and analysis results with the use of tools and platforms used in production and service management.	[SW1] Assessment of factual knowledge
	[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 computer systems to obtain data on production management and planning.	[SU1] Assessment of task fulfilment
	[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 has the ability to work alone.	[SK5] Assessment of ability to solve problems that arise in practice

Subject contents

Modern IT techniques in information systems for industry and services.
Basics of the Industry 4.0 concept.
Information systems used to manage production processes, as well as supporting engineering works.
Selected modern tools and platforms for the organization of production and logistics processes as well as automation and robotization of production systems.
Characteristics and applications of integrated information systems (ZSI).
Methods of data preparation and analysis using selected modern tools and platforms.
Methods of developing analysis results and reports using selected modern tools and platforms in production and service management.
Databases and two-dimensional data structures.
Usage of CSV files.
Database management systems.
Design and simulation of production and logistics processes using the FlexSim simulation package.
Sample applications of data analytics and machine learning.

Integrated IT systems (ZSI), including on the example of SAP:
- Enterprise Resource Planning (ERP)
- Manufacturing Resource Planning (MRP II)
- Material Requirements Planning (MRP)
- Master Production Schedule (MPS)
- Advanced Planning and Scheduling (APS)
- Warehouse Management System (WMS)
- Capacity Requirements Planning (CRP)
- Manufacturing Execution System (MES)
- Supply Chain Management (SCM)
- Customer Relationship Management (CRM)
- Information Rights Management (IRM), Enterprise Rights Management (ERM)
- Partner Relationship Management (PRM)

Prerequisites and co-requisites

Basics of computer science, Internet, ability to use MS Office.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Written work	60.0%	50.0%
Project works	60.0%	50.0%

Recommended reading	Basic literature	Rafał Kawa, Jacek Lembas, "Wstęp do informatyki", Wydawnictwo Naukowe PWN 2023. Larose Daniel T., "Metody i modele eksploracji danych", Wydawnictwo Naukowe PWN, Warszawa 2022. Grus Joel, "Data science od podstaw. Analiza danych w Pythonie", Wydawnictwo Helion 2020. Jinjer Simon, "Excel. Profesjonalna analiza i prezentacja danych", Wydawnictwo Helion 2022. Mieczysław Sobczyk, "Statystyka", PWN, Warszawa, 2022.
	Supplementary literature	Janina Jóźwiak, Jarosław Podgórski, "Statystyka od podstaw", PWE, Warszawa, 2012. Bruce Peter, Bruce Andrew, Gedeck Peter, "Statystyka praktyczna w data science. 50 kluczowych zagadnień w językach R i Python", Wydawnictwo Helion, Warszawa, 2021.
	eResources addresses	Adresy na platformie eNauczanie: Informatyka w zarządzaniu produkcją i usługami, W/P, ZiIP, sem. 01, zimowy 22/23 (M:00055042) - Moodle ID: 25669 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=25669
Example issues/ example questions/ tasks being completed	Discussion of information systems used to manage production processes, as well as supporting engineering works, including the use of the cloud (based on cloud service models and types of work). The use of selected modern tools and platforms to organize production and logistics processes as well as automation and robotization of production systems. Characteristics and applications of selected platforms: Google Colab. Characteristics and applications of a selected technological stack: Python, Matplotlib, NumPy, SciPy and others. Application of data preparation and analysis methods using selected modern tools and platforms. Methods of developing analysis results and reports using selected modern tools and platforms in production and service management. Databases and two-dimensional data structures. Use of CSV files for analytical tasks. Sample applications of data analytics and machine learning. Design and simulation of production and logistics processes using the FlexSim simulation package. Construction of a decision model (using AHP methods and a decision tree).	
Work placement	Not applicable	

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