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 2026		Academic year of realisation of subject	2026/2027			
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	Division of Manufacturing and Production Engineering -> Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Dominika Zakrzewska				
	Teachers						
Lesson types	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	Familiarization with the development and possibilities of using information technology and computer systems for production and service management. Acquiring basic knowledge in the field of ERP systems, SAP, data analytics, cloud computing, databases, data integration and processing in industry, digitalization trends in enterprises and aspects of Industry 4.0.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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 independently in selecting methods for implementing projects.	[SK5] Assessment of ability to solve problems that arise in practice
[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 important analytical data for the planning and management processes of production and services.	[SU1] Assessment of task fulfilment
[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 regarding data preparation and analysis results using tools and platforms used in production and service management.	[SW1] Assessment of factual knowledge
[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 industry, including the preparation and analysis of data and the development of results and reports, using selected modern tools and platforms.	[SW1] Assessment of factual knowledge

Subject contents

Course content – lecture
Introduction to the lecture topics as a whole.
Basics of the Industry 4.0 concept.
The concept of a smart product and the application of the industrial Internet of Things (IIoT).
Cyber-physical systems and smart factory.
Cloud computing - architecture, models and services in the cloud: IaaS, PaaS, SaaS. Resource virtualization technology.
OLTP (online transaction processing) and OLAP (online analytical processing) models and systems.
Integrated information systems (ZSI) - characteristics and applications.
Enterprise Resource Planning (ERP).
ERP systems as software for enterprise resource planning.
An integrated modular SAP ERP software package to support enterprise management.
SAP ERP software for integrating company business management processes.
Methods of integration, preparation and analysis of data using selected modern tools and platforms in production and service management.
Methods of developing analysis results and reports using selected modern enterprise tools and platforms.
Data integration in the form of a data warehouse, databases, database management systems (DBMS), two-dimensional data structures.
Use of CSV files - integration and analysis of two-dimensional data structures.
Data modeling, data types in statistics and levels of measurement. Data science fundamentals and empirical research.
Democratizing the use of data and data science in the enterprise.
Basics of data mining (data mining).
Design and simulation of production and logistics processes using the FlexSim simulation package.
Examples of applications of data analysis and machine learning.

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
Project works	60.0%	50.0%
Written work	60.0%	50.0%

Recommended reading	Basic literature	Rafał Kawa, Jacek Lembas, "Introduction to computer science", PWN Scientific Publishing House 2023. Daniel T. Larose, "Methods and models of data mining", Wydawnictwo Naukowe PWN, Warszawa 2022. Jerzy Auksztol, Magdalena Chomuszko, Piotr Balwierz, "SAP. Understanding the ERP system", PWN Scientific Publishing House, Warsaw, 2023. Joel Grus, "Data science from scratch. Data analysis in Python", Wydawnictwo Helion 2020. Simon Jinjer, "Excel. Professional analysis and presentation of data", Helion Publishing House 2022. Mieczysław Sobczyk, "Statistics", PWN Scientific Publishing House, Warsaw, 2022.
	Supplementary literature	Janina Jóźwiak, Jarosław Podgórski, "Statistics from scratch", PWE, Warsaw, 2012. Bruce Peter, Bruce Andrew, Gedeck Peter, "Practical statistics in data science. 50 key issues in R and Python", Helion Publishing House, Warsaw, 2021.
	eResources addresses	
Example issues/ example questions/ tasks being completed	Analysis of examples in the field of enterprise resource planning (ERP). Analysis of sample integration tasks for company management processes. Application of methods for integration, preparation and analysis of data using selected modern tools and platforms in production and service management. Application of methods to develop analysis results and reports using selected modern tools and platforms for the enterprise. Use of CSV files - integration and analysis of two-dimensional data structures. Sample data modeling, determining data types in statistics. Examples of democratizing the use of data and data science in the enterprise. Tasks related to the design and simulation of production and logistics processes using the FlexSim simulation package. Examples of applications of data analysis and machine learning. Characteristics and applications of the selected technology stack: Colab, Python, Pandas, Matplotlib, Stats, NumPy, SciPy and others.	
Practical activites within the subject	Not applicable	

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