GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Statistical analysis in production management, PG_00064718
Field of study	Management and Production Engineering

Date of commencement of studies	February 2025	Academic year of realisation of subject	2024/2025
Education level	second-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	Faculty of Mechanical Engineering and Ship Technology

Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Dariusz Fydrych
	Teachers	

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	15.0	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	7.0	23.0	75

Subject objectives	The aim of the course is to familiarize students with statistical techniques used in production management.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_U13] evaluates the feasibility and potential for utilizing new technical and technological achievements in accomplishing tasks characteristic for the field of study	Student classifies production processes	[SU1] Assessment of task fulfilment
	[K7_U04] creatively designs or modifies, in whole or at least in part, production and technological systems and processes, in accordance with the given specifications, taking into account technical and non-technical aspects, estimating costs and using known design techniques appropriate for tasks in the field of Management and Production Engineering	The student is able to acquire and use multidisciplinary knowledge.	[SU1] Assessment of task fulfilment
	[K7_W02] demonstrates structured and theoretically based knowledge covering key issues in the field of Management and Production Engineering allowing for modeling and analysis of stationary and non-stationary production processes and systems, devices and technological processes with continuous and discrete operation	The student is able to use statistical techniques	[SW1] Assessment of factual knowledge
	[K7_K11] is aware of importance of professional acting, the need for critical verification of acquired knowledge and consulting experts opinion in case of facing difficulties with individual problem solving	The student is active in acquiring knowledge	[SK2] Assessment of progress of work

Subject contents	
	Lecture:Basic concepts of statistics. Statistical model. Data mining. Taxonomy.Statistical analysis as a production optimization tool. The role of statistical methods in production engineering.Statistical software: Statistica, R, SPSS, Statgraphics, MS Excel. Principles of data preparation for statistical analyses.Basic statistics: measures of position and spread.Regression analysis: simple regression, multiple regression, factorial regression, polynomial regression, response surface regression.Logistic regression.Dimension reduction methods. Correspondence analysis. Factor analysis. Principal component analysis.Cluster analysis. Classification trees.Industrial statistics: experiment planning.Graphical methods of presenting multidimensional data: star plots, Chernoff faces, matrix plots, frame-whisker plots.Case study: machining, welding, other manufacturing processes
	Project:Development of a solution to a given multidimensional problem in the field of basic manufacturing techniques.Laboratory:Getting acquainted with the use of statistical programs (e.g. Statistica). Preparation of data for analysis.Task solution:Verification of the fit of the data to the normal distribution: the Shapiro-Wilk testSimple regressionMultiple regressionCluster analysisCorrespondence analysisLinear ordering

Prerequisites and co-requisites	

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Project	60.0%	20.0%
	Laboratory	60.0%	20.0%
	Test	60.0%	60.0%

Recommended reading		
	Basic literature	Stanisz, A. (2006). Przystępny kurs statystyki z zastosowaniem STATISTICA PL. *Wyd. StatSoft, Kraków*. Dobosz, M. (2004). *Wspomagana komputerowo statystyczna analiza wyników badań*. Akademicka Oficyna Wydawnicza EXIT.
	Supplementary literature	Kot, S., Jakubowski, J., & Sokołowski, A. (2007). *Statystyka: podręcznik dla studiów ekonomicznych*. Centrum Doradztwa i Informacji Difin.
	eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	Calculate the indicated measures of position and dispersion for the given dataset.
	Discuss the principles of experiment planning.
	Describe the idea of dimension reduction methods.
Work placement	Not applicable

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