GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Modeling and automation of technological processes, PG_00057386						
Field of study	Mechanical 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 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		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 inż. Bogdan Ścibiorski				
	Teachers						

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	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	6.0	24.0	75

Subject objectives	Getting acquainted with the problems of creating real models of the manufacturing process for the purposes of simulation in the conditions of automated production.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W10] possesses knowledge on the methods of technical and economic analysis of industrial systems and optimization of manufacturing systems; is familiar with the general principles of initiating and developing forms of individual entrepreneurship, particularly for innovative projects using the knowledge	Has knowledge of creating a simulation experiment under automated production conditions. Distinguishes between simulation models. Is able to formalize the features of the real system, determine the relationships between the objects of the production system in order to design a technological system close to optimal.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
[K7_U07] is able to perform a preliminary economic analysis of the undertaken engineering actions within the range of design, production and operation of machines and technical devices	He is able to prepare an experiment for the designed production model for initial analyzes aimed at increasing the efficiency of the production system.	[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
[K7_W09] possesses profound knowledge on the directions of development of construction of machines, devices, calculating methods and systems aiding the design, materials and their properties, manufacturing methods and diagnostics, control-measurement equipment	Has knowledge of the automation of technological processes and its impact on the formulation of the model and experiment	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge

| Subject contents | Lecture: Simulation model. Characteristics of the manufacturing system. Forms of automated production. Manufacturing flexibility. Machining automation. Production system modeling techniques. The concept of the system. Problems of stochastic processes. Modeling methods. Description of simulation objects. Techniques for measuring simulation results. Selected models of production systems in the conditions of automated production.

Project: design of a manufacturing structure model, determination of values for the parameters describing the efficiency of the manufacturing system. Model optimization. Decomposition and simulation. |
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Prerequisites and co-requisites	Knowledge of basic issues in the field of production organization		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	test	56.0%	60.0%
	Project	56.0%	40.0%

Recommended reading	Basic literature	1. Zdanowicz R., Świder J.: Komputerowe Modelowanie procesów wytwórczych, Wydawnictwo Politechniki Śląskiej, Gliwice 2013, 2. Hromada J., D. Plinta D.: Modelowanie i symulacja systemów produkcyjnych, Wydawnictwo Politechniki Łódzkiej, Bielsko- Biała 2000.
	Supplementary literature	1. Lasota A.: Modelowanie procesów produkcyjnych z wykorzystaniem diagramów aktywności języka UML i sieci Petriego Warszawa Exit 2012 2. Antczak P., Antaczak A., Witkowski T.: Optymalizacja przepływu produkcji seryjnej, PWE Warszawa 2016 3. Palchevskyi B., Świć A., Pavlysh V., Banaszak Z., Gola A., Krestianpol O., Lozynskyi V.: Komputerowo zintegrowane projektowanie elastycznych systemów produkcyjnych, Monografia, Politechnika Lubelska 2015
	eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	
Work placement	Not applicable