GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Modelling and simulation of production systems, PG_00055256		
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	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. Krzysztof Doerffer	
	Teachers	dr inż. Mieczysław Siemiątkowski dr inż. Tomasz Seramak dr inż. Aleksander Mroziński	

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	5.0	25.0	75

Subject objectives	The aim of the course is to familiarize students with modern methods of modeling and simulating discrete production processes and systems with the use of computer aided. Students will be prepared to use tools enabling modeling and simulation of manufacturing processes.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_K03] is aware of the social role of a graduate of a technical university, understands the importance of non-technical aspects and effects of engineering activities including their impact on the environment and responsibility for decisions, sees the need to formulate and provide the public with information and opinions on the achievements of technology, correctly identifies and resolves dilemmas associated with thejob of an engineer	The student will understand and take into account the non-technical aspects and effects of the operation of production systems, including their impact on the environment. The student will make decisions taking into account publicly available information and opinions regarding production management.	[SK4] Assessment of communication skills, including language correctness [SK5] Assessment of ability to solve problems that arise in practice [SK1] Assessment of group work skills
[K6_U05] is able to prepare and present a presentation on the results of analysis of the tasks in the area of production engineering, is able to plan and carry out experiments, measurements, computer simulations and analyses and interpret the results and draw conclusions is able to use analytical methods, simulation and experiments for formulating and solving problems associated with production engineering	The student will be able to prepare and present a presentation on the results of the analysis of the course of processes in the production system. The student will be able to plan and carry out an experiment in a modeled system using computer simulation and to interpret the obtained results and draw conclusions.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task
[K6_W10] has basic knowledge necessary to understand the economic determinants of engineering activities and economic law, to improve the work environment affecting productivity, costs and quality of work	The student will have basic knowledge necessary to understand the economic conditions of the operation of manufacturing systems and to improve the work environment affecting the efficiency, costs and quality of work.	[SW1] Assessment of factual knowledge
[K6_W05] has systematized, theoretically founded knowledge of modelling the operation of production systems with various structures and forms of their organization and the analysis of production processes using computer simulation methods	The student will have knowledge of modeling production systems with various structures and forms of their organization. The student will be able to analyze the course of production processes using computer simulation methods.	[SW1] Assessment of factual knowledge

Subject contents

Structures, types and forms of production systems. Production flow models in production systems. Methods of modeling discrete production systems. Optimization models. Production system modeling techniques. Simulation methods and tools. Data types in modeling and simulation. Stochastic modeling. Parameters and variables in the modeling and simulation of production processes.

Prerequisites and co-requisites

Knowledge of manufacturing processes, means of production, statistics.

Assessment methods and criteria

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

Recommended reading

Basic literature

R. Zdanowicz: Modelowanie i symulacja procesów wytwarzania, Wydawnictwo Politechniki Śląskiej, Gliwice 2002r.J. Hromada, D. Plinta: Modelowanie i symulacja systemów produkcyjnych, Wydawnictwo Politechniki Łódzkiej, Bielsko- Biała 2000r.Z. Banaszak, L. Jampolski: Komputerowo wspomagane modelowanie elastycznych systemów produkcyjnych, WNT Warszawa 1991.

	Supplementary literature	Artur Maciąg, Roman Pietroń, Sławomir Kukla: Prognozowanie i symulacja w przedsiębiorstwie. PWE, Warszawa 2013.Gabriel Kost, Łukasz Węsierski, Piotr Łebkowski: Automatyzacja i robotyzacja procesów produkcyjnych. PWE, Warszawa 2013.Iwona Pisz, Tadeusz Sęk, Władysław Zielecki: Logistyka w przedsiębiorstwie. PWE, Warszawa 2013.
	eResources addresses	Adresy na platformie eNauczanie: Modelowanie i symulacja systemów produkcyjnych, PG_00055256 - Moodle ID: 38362 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=38362
Example issues/ example questions/ tasks being completed	Stochastic processes in production systems.	
Work placement	Not applicable	