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Subject card

Subject name and code	Modelling and automation of technological processes, PG_00059376
Field of study	Mechanical Engineering

Date of commencement of studies	February 2023	Academic year of realisation of subject	2023/2024
Education level	second-cycle studies	Subject group	Optional subject group Subject group related to scientific research in the field of study
Mode of study	Part-time studies	Mode of delivery	blended-learning
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	dr inż. Bogdan Ścibiorski

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	18.0	0.0	0.0	9.0	0.0	27
	E-learning hours included: 18.0						

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	27	7.0	41.0	75

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

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[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 can prepare an experiment for the designed model production in order to preliminary analyzes aimed at increasing efficiency manufacturing system	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools
	[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 automation technological processes and its influence on model formulation i experiment	[SW1] Assessment of factual knowledge
	[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 simulation experiment in automated conditions production. It distinguishes between models simulation. Can formalize the features of the system real, determine the occurring relations between objects manufacturing system in order system design technological similar to optimal.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects

Subject contents	Lecture: Simulation model. Characteristics of the manufacturing system. Forms of automated production. Manufacturing flexibility. Machining automation. System modeling techniques production. The concept of the system. Problems of stochastic processes. Modeling methods. Description simulation objects. Techniques for measuring simulation results. Selected models of production systems in conditions of automated production. Project: design of the manufacturing structure model, determination of values for the parameters describing the efficiency manufacturing system. Model optimization. Decomposition and simulation.
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
	Tests	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 201
	eResources addresses	Adresy na platformie eNauczanie: Modelowanie i automatyzacja procesów technologicznych, W/P, MiBM, sem. 02, zimowy 23/24 (PG_00059376) - Moodle ID: 32747 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32747

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