



Subject card

Subject name and code	Simulation Modelling of Processes, PG_00044442						
Field of study	Engineering Management						
Date of commencement of studies	October 2021	Academic year of realisation of subject				2023/2024	
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	Part-time studies	Mode of delivery				at the university	
Year of study	3	Language of instruction				Polish	
Semester of study	6	ECTS credits				4.0	
Learning profile	general academic profile	Assessment form				assessment	
Conducting unit	Department of Management -> Faculty of Management and Economics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Andrzej Szuwarzyński				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	16.0	0.0	16.0	0.0	0.0	32
	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	32	8.0		60.0	100	
Subject objectives	The aim is to acquire practical skills in building process models with the use of iGrafx Process, conducting simulation experiments, and drawing conclusions based on simulation results.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U08] analyses engineering and managerial solutions in decision-making processes, taking into account pro-quality and pro-environmental aspects, as well as safety of work processes		Interprets the simulation results. He combines knowledge of management and simulation modeling.		[SU4] Assessment of ability to use methods and tools		
	[K6_W13] has a basic knowledge of the design, modelling and optimisation of technical processes and systems		Describes the processes with the use of iGrafx. Identifies the stages of the processes.		[SW1] Assessment of factual knowledge		
Subject contents	[K6_U04] forecasts phenomena and processes in the organisation, including technical and innovative processes						
	Introduction to the subject. Defining basic concepts, queuing systems, models. General characteristics of the process approach in the organization. Structure of the simulation model (static and dynamic). Principles of building a process map. Introduction to iGrafx. Structure: department, activity, resources, costs, transaction generator, schedules. Rules for assigning properties to activities: inputs, outputs, task, resources, attributes. Defining the task (task type, duration, schedule, capacity). Defining inputs to an activity (starting point, collecting input transactions). Transaction generators, types and definition. Resources, defining (classification, costs, schedule, overtime, costs, availability, attributes), assigning to tasks (type, origin, assignment method, constraint, waiting options, affinity). Tasks, types (work, delay, sub-process, concurrent process), costs (value class), overtime. Attributes, defining (location, type, value, name), setting the value. Defining decision-making activities. Defining the simulation environment. Principles of building a scenario. Carrying out a simulation experiment. Analysis of the results. Implementation of a simple queuing system based on the model description. Preparation of an individual design of a complex queuing system.						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Exam		56.0%		50.0%		
	Laboratory - exercisec		56.0%		50.0%		

Recommended reading	Basic literature	<p>Filipowicz B.: Modele stochastyczne w badaniach operacyjnych. WNT, Warszawa 1996</p> <p>Grajewski P.: Organizacja procesowa, PWE, Warszawa 2007</p> <p>Grzesiak M.: Modelowanie procesów biznesowych z wykorzystaniem narzędzi iGrafx Process 2015, Gdańsk, Wydawnictwo PG 2018</p> <p>Mielczarek B.: Modelowanie symulacyjne w zarządzaniu. Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2009</p> <p>Dokumentacja programu iGrafx Process 2020, dostępna w Internecie</p> <p>Materiały do zajęć dostępne na e-nauczaniu</p>
	Supplementary literature	<p>Adair C.B., Murray B.A.: Radykalna reorganizacja firmy. Wydawnictwo Naukowe PWN, Warszawa 2002</p> <p>Champy J.: X-engineering przedsiębiorstwa. Wydawnictwo Placet, Warszawa 2003</p> <p>Hammer M.: Reinżynieria i jej następstwa. Wydawnictwo Naukowe PWN, Warszawa 1999</p> <p>Tyszer J., Symulacja cyfrowa, WNT, Warszawa 1978</p>
	eResources addresses	
Example issues/ example questions/ tasks being completed	<p>Build a simulation model of the selected process.</p> <p>Perform a simulation experiment.</p> <p>Interpret the results and make improvements to the process.</p>	
Work placement	Not applicable	