GDAŃSK UNIVERSITY OF TECHNOLOGY

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	blended-learning
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 inż. Marzena Grzesiak	
	Teachers	dr inż. Marzena Grzesiak	

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: 4.0

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_U04] forecasts phenomena and processes in the organisation, including technical and innovative processes	Models real processes. Analyses process performance based on simulation results. Constructs process flow scenarios.	[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
[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

Subject contents

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 - exercises	56.0%	50.0%

Recommended reading	Basic literature	Filipowicz B.: Modele stochastyczne w badaniach operacyjnych. WNT, Warszawa 1996 Grajewski P.: Organizacja procesowa, PWE, Warszawa 2007 Grzesiak M.: Modelowanie procesów biznesowych z wykorzystaniem narzędzi iGrafx Process 2015, Gdańsk, Wydawnictwo PG 2018 Mielczarek B.: Modelowanie symulacyjne w zarządzaniu. Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2009 Dokumentacja programu iGrafx Process 2020, dostępna w Internecie Materiały do zajęć dostępne na e-nauczaniu
	Supplementary literature	Adair C.B., Murray B.A.: Radykalna reorganizacja firmy. Wydawnictwo Naukowe PWN, Warszawa 2002 Champy J.: X-engineering przedsiębiorstwa. Wydawnictwo Placet, Warszawa 2003 Hammer M.: Reinżynieria i jej następstwa. Wydawnictwo Naukowe PWN, Warszawa 1999 Tyszer J., Symulacja cyfrowa, WNT, Warszawa 1978
	eResources addresses	Adresy na platformie eNauczanie: Modelowanie symulacyjne procesów - Moodle ID: 24418 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=24418
Example issues/ example questions/ tasks being completed	Build a simulation model of the selected process. Perform a simulation experiment. Interpret the results and make improvements to the process.	
Work placement	Not applicable	