THE INTERNATIONAL UNIVERSITY OF LOGISTICS AND TRANSPORT IN WROCLAW

SYLLABUS

Teacher					
Course	Simulation Based on discrete event system				
Module	Optional course	ECTS	4	Course code	23SM.P.L.B.IEP.3.1

Major	Speciality	Academic year
LOGISTICS	Industrial systems engineering	2023/2024

Semester	THIRD	Year of studies	SECOND

Type of studies	Full-time				Extramural			
Type of classes	Lecture	Exercise	Laboratories	Project	Lecture	Exercise	Laboratories	Project
Amount of hours	18	12	12					
TOTAL	42							

Course objectives
The main objective of the course is to train students with the area of simulation in the area of industrial engineering, in particular the simulation based on discrete event system "DES". Some industrial case study will be modelled and solved using simulation based on DES. A sensitivity study and interpretation of the obtained results will be discussed in order to establish an economical operational plan according to proposed industrial case study.

Minimum knowledge required from the student before the classes beginning
Basic knowledge in algorithmic, some mathematical model of random variables

distribution laws

Recommended literature to study before the classes beginning
Banks J., Carson J.S., Nelson B.L., Nicol D.M., Discrete-Event System Simulation, Pearson, 2019

LEARNING OUTCOMES			KEK	METHODS OF ASSESSMENT	
KNOWLEDGE	K01	Knowledge of definition and using of random variables	K2_W04_L_P	EM13	Presentation assessments
	K02	Knowledge of theory simulation based on discreet event system	K2_W05_L_P	EM13	Presentation assessments
	K03	Knowledge of basic mathematical model development	K2_W05_L_P	EM13	Reports assessment
	K04				
	K05				
SKILLS	S01	Ability to understand an industrial problem and identify the decision variables	K2_U09_L_P	EM13	Presentation assessments
	S02	Ability to model an industrial problem	K2_U01_L_P	EM13	Presentation assessments
	S03	Ability to solve the problem using simulation based on DES	K2_U15_L_P	EM11	Reports assessment
	S04	Ability the made a sensitivity study	K2_U15_L_P	EM11	Reports assessment
	S05	Ability to analyse and interpret the obtained results in order to make a decision	K2_U15_L_P	EM11	Reports assessment
SOCIAL COMPETENCE	SC01	Student is able to develop and use acquired knowledge and skills, and share this knowledge with the group	K2_K04_L_P	EM11	Reports assessment
	SC02				
	SC03				
	SC04				

Course contents	Lecture	Introduction Simulation project management Simulation based on discrete event system Industrial examples Problem related to reliability and maintenance Inventory management problem Logistic problem (IS-MSP-OS-D(T))
	Exercises	Realizing algorithms

	Laboratories	Compiling developed algorithms on Mat lab software Made sensitivity study and analysing obtained results
	Projects	Using PRMODEL software

Teaching methods	**TM1**	**Informational lecture**
	TM15	**Laboratories – simulation analysis (computational, computer simulations)**
	TM16	**Laboratories – task and problem solving**

Obligatory literature	1	Robinson S., Simulation: The Practice of Model Development and Use, Palgrave Macmillan, 2018
	2	Borshchev A., The Big Book of Simulation Modeling: Multimethod Modeling with AnyLogic, AnyLogic North America, 2019
	3	Standridge C.R., Discrete Event Simulation: A First Course, Pearson, 2020

Additional literature	1	Fowler J.W., Rose O., Grand Challenges in Modeling and Simulation of Complex Manufacturing Systems, Simulation, Sage Publications, 2018
	2	
	3	

Requirements to pass the course
1-Class attendance. Each student is entitled to one unexcused absence. Acceptable late to class 15 minutes - after this time the student will not be allowed into the class. 2-Reports performed during classes. In all laboratory classes the student is required to prepare a report. Reports will be prepared in groups of two, and their substantive content will be discussed in the relevant classes. 3-Active participation and cooperation with the teacher 4- All students must request to proposed final exam. Each response will be scored 0 - 10 points. 5- Active participation and cooperation with the teacher is demanded.