

**DOCTORAL SCHOOL OF WROCLAW UNIVERSITY OF SCIENCE AND
TECHNOLOGY**

SUPERVISOR DECLARING/CONDUCTING COURSE: dr hab. inż. Bożena Mielczarek/
dr hab. inż. Anna Kowalska-Pyzalska
DEPARTMENT: K43/W8
SCIENTIFIC DISCIPLINE: NZJ

COURSE CARD

Course name in Polish: Metody Symulacyjne w zarządzaniu
Course name in English: Simulation methods in management
Course language: English
University-wide general course type*:
The course is intended for all PhD students: YES / NO

- 1) BASIC COURSE
- 2) SPECIALIST COURSE
- 3) SEMINAR
- 4) HUMANISTIC COURSE
- 5) LANGUAGE

Subject code: **NZQ100133W**

* delete as applicable

	Lecture	Foreign language course	Seminar	Mixed forms
Number of hours of organized classes in university (ZZU)	30			
Grading	Exam	Exam	Oral presentation	Exam, inspection, evaluation classes

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

Basics of mathematical statistics

COURSE OBJECTIVES

- C1 Knows and understands the main scientific paradigms of simulation methods in the field of continuous and discrete simulation.
C2 Can choose the right simulation method for the research

PROGRAM CONTENTS

Lectures		Hours
Wa1-2	Simulation paradigms. The course of simulation modeling	2
Wa3-4	Discrete event simulation. Part 1	4
Wa5-6	Discrete event simulation. Part 2	4
Wa7-8	Monte Carlo Method	4
Wa9-10	System dynamics	4
Wa11-12	Agent-based modeling – part 1	4

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Wa13-14	Agent-based modeling – part 2	4
Wa15	Final test	2
	Total number of hours	30

TEACHING TOOLS USED
N1. Arena N2. NetLogo N3. Microsoft Excel N4. Power Point

ACHIEVED SUBJECT LEARNING OUTCOMES		
Type of learning outcome	Code of learning outcome	Assessment of learning outcome
Knowledge	P8S_WG	Final test
Skills	P8S_UW	Project
Skills	P8S_UK	Defence of the project

PRIMARY AND SECONDARY LITERATURE
<p><u>PRIMARY LITERATURE:</u></p> <p>[1] Kelton W.D., Sadowski R.P, Zupick N.B., <i>Simulation with Arena</i>, McGraw Hill Higher Education, 2015</p> <p>[2] Law A.M., Kelton W.D., <i>Simulation Modeling and Analysis</i>, McGraw Hill Higher Education, 2015</p> <p>[3] Wilensky U., Rand W. <i>Introduction to agent-based modeling: modeling natural, social and engineered complex systems with NetLogo</i>, MIT Press, 2015</p> <p>[4] Hamill L., Gilbert N. <i>Agent-based modeling in economics</i>, Wiley 2016</p> <p><u>SECONDARY LITERATURE:</u></p> <p>[1] Squazzoni F., <i>Agent-based computational sociology</i>, Wiley, 2012</p> <p>[2] Rossetti M.D., <i>Simulation modelling and Arena</i>, John Wiley and Sons, Inc., 2010</p> <p>[3] Mielczarek B., <i>Modelowanie symulacyjne w zarządzaniu. Symulacja dyskretna</i>. Oficyna Wydawnicza PWr Wrocław 2009</p> <p>[4] Winston W.L., <i>Analiza i modelowanie danych biznesowych</i>, APN Promise, Warszawa 2017</p>
<p><u>SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)</u></p> <p>Dr hab. inż. Bożena Mielczarek, prof. uczelni, bozena.mielczarek@pwr.edu.pl</p> <p>Dr hab. inż. Anna Kowalska-Pyzalska, prof. uczelni, anna.kowalska-pyzalska@pwr.edu.pl</p>