



Course title	Advances in Data-Intensive Modelling and Simulation (Master)
Institute/Division	Faculty of Computer Science and Mathematics/ Department of Computer Science
Course code	F-1.AMS
Erasmus subject code*	11.3
Number of contact hours**	45 lecture hours (45h)
Course duration	1 semester (Fall or Spring)
ECTS credits	6
Course description (max 100 words)	Data-intensive modelling and Simulation (M&S) can consequently be construed as an interdisciplinary area requiring efficient exploitation of cloud and high-performance computing resources via novel parallel programming, task scheduling, and data handling to leverage large applicative environments. This course presents the recent developments in M&S in data-intensive infrastructure management, heuristics for scheduling and execution, data management and parallel programming techniques, and scientific applications. It includes: 1) Introduction and basic concepts for Modelling and Simulation in modern distributed computing environments; 2) Steps in a simulation study, probability and statistics for simulation; 3) Modern data centers, Big Data processing models and simulation; 4) Simulation environments of computational grids and clouds; 5) Multiagent systems – simulators 6) Analysis of simulation output for a single system and multiple systems comparisons
Literature	1) Law, A.M. Simulation Modeling and Analysis (5th edition), McGraw-Hill, 2014. https://simcloud.com/ 2) J.Kolodziej. Evolutionary Hierarchical Multi-Criteria Metaheuristics for Scheduling in Large-Scale Grid Systems, Springer Vlg., 2012 3) M. J. Wooldridge. An Introduction to Multi-Agent Systems, John Wiley & Sons, 2009, Second Edition.
Course type/organization	<ul style="list-style-type: none">• Lectures (15h)• Projects (30h)
Assessment method	Attending lectures and completing the practical projects with the reports.
Prerequisites	<ul style="list-style-type: none">• Backgrounds in data mining, global optimization, artificial intelligence• Advanced practical knowledge of Python, Java
Primary target group	Bachelor degree in computer sciences telecommunication or a similar discipline
Contact person	Joanna Kołodziej (PhD, DsC, Prof.PK)
Remarks	N/A

*please insert one of the following codes:

- 11.0 Mathematics, Informatics
- 11.1 Mathematics
- 11.2 Statistics
- 11.3 Informatics, Computer Science
- 11.4 Artificial Intelligence
- 11.5 Actuarial Science
- 11.9 Others Mathematics, Informatics

**1 lecture hour=45 minutes