

Educational Programme	Modeling and Simulation
Degree Awarded	Master in Computer Science
Standard Length of Studies (Number of ECTS Credits)	2 years – 4 semesters – 120 ECTS
Type of Study	Full-time
Higher Education Institution	Babeş-Bolyai University
Faculty / Department	Faculty of Mathematics and Computer Science
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Profile of the Degree Programme	Modeling and Simulation degree program
Target Group / Addressees	Graduates in Mathematics, Computer Science, Economics, Electrical/Electronic Engineering, Physics, Chemistry, Biology, etc.
Entrance Conditions	The overall three-year undergraduate average grade is taken into consideration as selection criterion.
Further Education Possibilities	The master's program aims at providing students with the appropriate tools for further doctoral studies and professional activity.
Description of Study	Core disciplines: Advanced methods of data analysis, Computational statistical methods, Modeling the behavior of software systems, Discrete event simulation, Visualization and validation in simulation, Parallel and concurrent calculus, Formal methods in programming languages, Simulation methods, Cooperative intelligent agents, Mathematical modeling, Modeling of economical processes, simulation languages
Purposes of the Programme	Programme objectives: training in the modeling and simulation of various types of problems; acquisition of the mathematical knowledge necessary in order to tackle complex problems; the acquisition of in-depth knowledge in the modeling / design / implementation of complex applications aimed at simulating various aspects and solving problems specific to natural sciences or economics; the acquisition of specialized knowledge in the analysis and improvement of software processes; professional modeling for team work as well as interdisciplinary approaches to research and development.
Specialization / Area of Expertise	Mathematical modeling in Computer Science, Simulation tools and methods, Intelligent methods in problems solving
Extra Peculiarities	Optional: Practice of Education.
Practical Training	In the 2 nd year (4 th semester) of the program the students participate in a research project in of Modeling and Simulation.
Final Examinations	Dissertation thesis
Gained Abilities and Skills	General competences: Advanced knowledge of theoretical, methodological, and practical developments in computer

	<p>science; Systematic use of computer science knowledge to model and interpret new situations, within application contexts larger than the known ones; Detailed knowledge and integrated use of conceptual and methodological apparatus pertaining to informatics to provide solutions for incompletely defined situations, to solve new theoretical and practical problems; Proficient use of verification, validation, and evaluation criteria and methods to his/her own software solutions, ability to formulate value judgments and to justify/explain constructive decisions; Use advanced skills to develop and conduct complex software projects, of practical and/or research nature, using a wide range of quantitative and qualitative methods; Advanced communication skills within different professional environments, appropriate use of computer science vocabulary, good English knowledge; Team work abilities, assuming different execution and leading roles, performing professional tasks with considerable amounts of autonomy and responsibility</p> <p>Specialty competences: Demonstrate advanced modeling skills for economic, industrial, scientific phenomena and processes, by using fundamental mathematical, statistical, and computer science knowledge; Demonstrate advanced skills to analysis, design, and construction of software systems, using a wide range of hardware / software platforms, programming languages and environments, and modeling, verification and validation tools; Demonstrate advanced skills to apply simulation for solving real phenomena and to develop and build procedures for efficient use of statistical methods; Demonstrate advanced skills to apply methods for data analysis and processing, data mining, pattern recognition. Ability to teach students in high schools computer science concepts and theories, provided that the holder of the dissertation diploma owns a graduation certificate of the pedagogical education module</p>
<p>Job Placement, Potential Field of Professional Activity</p>	<p>Experts in software companies, developer positions, tester positions.</p>