Educational Programme	**Optimization of computational models**
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	Babes Bolyai University
Faculty / Department	Faculty of Mathematics and Computer Science
Contact Person	dr. Anna Soos
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Fax	+40264591906
E-mail	asoos@math.ubbcluj.ro
Profile of the Degree Programme	**Optimization of computational models** degree program
Target Group / Addressees	Graduated in Computer Science, Mathematics, Physiscs, Engeneering, Chemistry, Biology
Entrance Conditions	The overall tree-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	This master program present new methods of optimization in data analysis, parallel computing, stochastic search, stochastic modeling of data and simulation methods. The query optimization in databases and cryptography will be presented. The research project in optimization of computational models is an introduction in scientific research practice. Core courses: Coding Theory, Stochastic Search Methods, Design Patterns in Java, Cryptography, Implementation of Database Management Systems, Simulation Methods, Parallel Programming Paradigms, Stochastic Modeling of Data, Query Optimization in Databases, Component-Oriented Techniques in Optimisation, Information Retrieval
Purposes of the Programme	This master program gives an overview of the advanced concepts of optimization techniques in different areas of computer science. The program gives the following general competences: Advanced knowledge of theoretical, methodological, and practical developments in computer 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 judgements 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
Specialization / Area of Expertise	Optimal methods and techniques in computational models, intelligent methods in problems solving
Extra Peculiarities	Optional: practice of education
Practical Training	In the 4th semester of the program the students participate in a research project in Optimization of computational models
Final Examinations	Dissetation thesis
Gained Abilities and Skills	Speciality 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 optimization skills to design and build software systems, using advanced optimization techniques. • 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
Job Placement, Potential Field of Professional Activity	Experts in software companies, developer positions, tester positions

Date: October 25, 2010
Signature: