

PROGRAMME PROFILE

Educational Program	Mathematics Computer Science
Degree Awarded	Bachelor in Mathematics
Standard Length of Studies (Number of ECTS Credits)	3 years—6 semesters; 180 credits
Type of Study	Full-Time
Higher Education Institution	Babes-Bolyai University Cluj-Napoca, Romania
Faculty / Department	Faculty of Mathematics and Computer Science
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Profile of the Degree Program	Mathematics and Computer Science
Target Group / Addressees	High school students from the real profile classes, students with a bachelor degree in Natural Sciences, in Economics or in Technical Sciences interested to understand and manipulate basic concepts of fundamental mathematical structures and of Computer Science, as well as the fundamental methods of software systems development and maintenance.
Entrance Conditions	The four-year high school average grade in Mathematics or Computer Science, the average grade of the Mathematics or Computer Science exam of the school-leaving examination and the final grade of the school-leaving examination are taken into consideration as selection criterion.
Further Education Possibilities	The bachelor programme in Mathematics Computer Science provides the students with the appropriate knowledge and tools for further master degree studies and/or for their professional activity in education, IT, administration, industry or finance.
Description of Study	<p>The programme's purpose is to provide the students with the capacity to understand and manipulate the basic concepts and methods of fundamental mathematical structures, of fundamental programming and of software systems development and maintenance, to transmit and value the studied knowledge and methods, to permanently learn, understand and apply the most recent scientific results in Mathematics and Computer Science and to understand and approach, by mathematical and computing tools and methods, problems of mathematical nature from other sciences.</p> <p>Core courses: Algebra (I-III), Mathematical Analysis (I-III), Geometry (I-III), Differential Equations and Dynamical Systems, Complex Function Theory, Number Theory, Mathematical Software, Fundamentals of Programming, Computer System Architecture, Operating Systems, Databases, Probability and Statistics, Software</p>

	<u>Engineering, Artificial Intelligence</u>
Purposes of the program	<p>The purpose of the programme is to offer the following competences:</p> <ul style="list-style-type: none"> - to teach fundamental knowledge in mathematics and computer science - to elaborate algorithms and use modern computer systems. - to generate and implement new scientific and didactic approaches and methods. - to use modern information technologies to typewrite papers and documents, process information and manage different databases. - to use basic and complementary knowledge in pursuing a master program in the field of Mathematics, Computer Science or related fields.
Specialization / Area of Expertise	<p>Fundamental skills and methods in the main fields of pure mathematics:</p> <ul style="list-style-type: none"> • Algebra (Basic Algebraic Structures, Linear Algebra) • Geometry (Analytical Geometry, Differential Geometry), • Mathematical Analysis (Calculus, Topology, Optimization, Complex Analysis) • Differential Equations • Probability and Statistics • Mathematical Models in Other Sciences • Fundamentals of Programming • Data Structures and Algorithms • Mathematical Software • Computer System Architecture • Operating Systems, • Databases
Extra Peculiarities	Software Engineering, Artificial Intelligence, Numerical Analysis, History of Mathematics, Teaching: Pedagogical Theories in Math/Computer Science Education, Psychology of Education, Documentation Methodology for Scientific Projects
Practical Training	Practice in Math/Computer Science Education
Final Examinations	A licence thesis is defended in an oral examination. The student should demonstrate the ability to understand, value and transmit ideas, methods and knowledge in the fundamental fields of mathematics and computer science
Gained Abilities and Skills	<p><u>General competencies</u></p> <ul style="list-style-type: none"> • Ability to understand and manipulate basic concepts of fundamental mathematical structures. • Ability to transmit and value the studied knowledge and methods. • Ability to understand and approach problems of mathematical nature from other sciences, and as well to work in interdisciplinary teams. • Ability to permanently learn, understand and apply the

	<p>most recent scientific results.</p> <ul style="list-style-type: none"> • Knowledge, understanding and use of basic concepts of Computer Science and of the fundamental methods of software systems development and maintenance. • Ability to work independently and/or in a team in order to solve problems in defined professional contexts. • Ability to use modern information technologies to typewrite papers and documents, process information and manage different databases, specific to activities in different types of economic, administrative, educational and research institutions. • Ability to analyze and synthesize. <p><u>Speciality competencies</u></p> <ul style="list-style-type: none"> • Ability to teach fundamental knowledge in the field of mathematics. • Ability to elaborate algorithms and use modern computer systems. • Ability to generate and implement new scientific and didactic approaches and methods. • Ability to use basic and complementary knowledge in pursuing a master program in the field of Mathematics or related fields. • Ability to analyze, synthesize and model phenomena and processes characteristic to economy, industrial and scientific fields using adequate mathematical, statistical, computational and informatical methods. • Ability to use and maintain educational software for primary education and gymnasium.
Job Placement, Potential Field of Professional Activity	The holder of a diploma in Mathematics Computer Science may activate, under the condition of graduating the pedagogical module, as teacher in Speciality of Mathematics in any state or private educational institution of gymnasial level. As well, the holder of this diploma may activate in any institution or company from the economy or administration in positions requiring the study and application of fundamental knowledge of mathematics and computer science.

Date: October 25, 2010

Signature: