

Educational Programme	Information Engineering (in Romanian, Hungarian, English)
Degree Awarded	Bachelor in Information Engineering
Standard Length of Studies (Number of ECTS Credits)	4 years - 8 semesters - 240 ECTS
Type of Study	Full-Time
Higher Education Institution	Babes-Bolyai University
Faculty / Department	Faculty of Mathematics and Computer Science
Contact Person	Bazil PARV
Phone	+40.264.405.327
Fax	+40.264.591.906
E-mail	bparv@cs.ubbcluj.ro
Profile of the Degree Programme	Computers and Information Technology, Computer Science
Target Group / Addressees	High-school bachelors interested in the field of Software Engineering, coming from Romania or abroad. Students with a bachelor degree in Natural or Technical sciences. The Information Engineering programme is developed in three languages (Romanian, Hungarian and English)
Entrance Conditions	<ul style="list-style-type: none"> • Baccalaureate average grade (25% in the final grade); • The grade at the exam of mathematics and/or the grade at the exam of computer science at the baccalaureate (25% in the final grade) • The overall high-school grade at the discipline of mathematics or computer science (50% in the final grade).
Further Education Possibilities	The undergraduate programme in Information Engineering provides the students with the appropriate knowledge and tools for further master degree studies and/or for their professional activity in software development, education, administration, industry or finance.
Description of Study	Labor market demands highly qualified software engineers. Our programme offers a coherent approach by combining theoretical knowledge with modern technologies and practical work. The curricula is build using the paradigm “scientist-practitioner”, being inspired from other European software engineering and computer science programmes, thus ensuring the compatibility of studies in the European Higher Education Area.
Purposes of the Programme	<p>The purposes of the programme are the following</p> <ul style="list-style-type: none"> • to teach fundamental concepts of computer science and mathematics • to teach how to use software engineering concepts and methods in software development and maintenance • to teach problem-solving methods and techniques • to give students the appropriate knowledge and skills related to design and administration of database systems and computer networks • to give students the appropriate motivation and abilities related to team work, professional communication and development

Specialization / Area of Expertise	<p>Fields of study</p> <ul style="list-style-type: none"> • Computer science fundamentals (Programming and Programming Languages, Mathematical Foundations of Computer Science, Algorithms and Data Structures, Object-Oriented Programming, Advanced Programming Methods, Functional and Logic Programming, Discrete Mathematics, Formal Languages and Compiler Design, Non-Sequential Programming Paradigms) • Fundamentals of mathematics (Mathematical Analysis, Algebra, Geometry, Probability Theory and Statistics, Numerical Methods, Differential Equations, Equations of Mathematical Physics, Information Theory, Experimental Data Processing) • Engineering fundamentals (Physics, Electrotechnics, Design with Microprocessors, Systems Theory, Process Modeling and Simulation, Virtual Instrumentation) • Data modeling and processing (Databases, Transaction Management and Distributed Databases, Spatial Databases) • Software engineering (Software Engineering, Team and Individual Project, Software modeling, Software Verification and Validation, Integrated Software Systems, Enterprise Information Management, CASE Tools, Human-Computer Interaction, Mobile Systems, Design Patterns) • Computer systems and architectures (Computer System Architecture, Operating systems, Distributed Operating Systems, Computer Networks) • Artificial intelligence (Artificial Intelligence, Intelligent Robots, Evolutionary Algorithms, Automated Theorem Proving, Intelligent Methods for Solving Real Problems) • Programming technologies (Programming Systems and Environments, Web Programming) • Interdisciplinarity (Multimedia, Image processing, Modeling and simulation)
Extra Peculiarities	-
Practical Training	Besides individual and team software projects, students need to have 6 weeks of summer practice in real-world organizations. (Optional) Practice in Computer Science Education
Final Examinations	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 computer science and software engineering
Gained Abilities and Skills	<p><u>General abilities and skills</u></p> <ul style="list-style-type: none"> • Knowledge, understanding and use of basic concepts of theoretical Computer Science • Knowledge, understanding and use of the fundamental methods, processes and tools of Software Engineering

	<ul style="list-style-type: none"> • Understanding of basic concepts of Mathematics and use them to problem-solving activities. • Ability to permanently learn, understand and apply the most recent scientific results in the field of Computer Science and Software Engineering. • Ability to understand and approach problems of modeling nature from other sciences • Ability to work independently and/or in a team in order to solve problems in defined professional contexts. <p><u>Speciality abilities and skills</u></p> <ul style="list-style-type: none"> • Good programming skills in high-level languages • Abilities to develop and maintain software systems • Deep understanding of a real-world organization (structure and processes carrying information) • Abilities to design and manage database systems • Abilities to design and administer computer networks • Ability to analyze, synthesize and model phenomena and processes from various fields (economy, science, research, education) using adequate mathematical, statistical, computational and software engineering methods.
<p>Job Placement, Potential Field of Professional Activity</p>	<p>A diploma holder in Information Engineering may activate in any institution or company, occupying positions of software engineer or the like: analyst, programmer, developer, system designer, system engineer, network and database administrator, software project manager, computer science consultant, administrator of educational platforms. If the holder of diploma is also a graduate of the pedagogical module, he/she may activate as teacher of Computer Science in any gimnasial and high-school level educational institution.</p>