

*The primary task undertaken by the Computer Science for Economics Bachelor Program* is to prepare students so that they meet the challenges posed by their employment in companies that are compelled to carry out activities in a business environment increasingly internationalized, technological and competitive, by providing training and a relevant experience in the field and which are recognized both nationally and internationally. Therefore, the Computer Science for Economics bachelor program aims to address the curricula not only in theoretical terms, but also to create multiple connections between practice and research.

*Graduates of the Computer Science for Economics Bachelor Program from the School of Computer Science for Business Management* can be hired on positions such as: economist specialist in the computer science; IT systems analyst and designer; developer of customer-server applications and of internet/intranet/extranet; IT project manager; web-site designer; database administrator; computer network administrator; web-site administrator; developer of decision assisting systems and expert systems; IT consultant; etc. All faculty members of our University meet the legal requirements, in that all professors, associate professors and lecturers have a PhD title and the teaching assistants and junior assistants have Master studies and certified teaching training, all of them being PhD students. Most of our faculty has studied abroad, some of them in the US and during each semester you will have American Professors teaching you 1-2 courses.

Extracurricular courses are taught by American and International professors (at no cost) for our students several times each semester, a list can be consulted at the following address:

<http://guestcourses.rau.ro/>

*Scientific research undertaken by the faculty of the Computer Science for Business Management* is mainly focused on the affiliated Centers for scientific research: *Microsoft Innovation Center – Romanian- American University, The Center of Research, Consultancy and Training in Computer Science for Economics and IT&C, URAINFORTIS, The Center of Research, in IT&C and Artificial Intelligence URA-CCTIC*. Supplying teaching materials for all subjects has been a constant concern of the faculty board and specialty departments that analyze annually the need for textbooks and their availability in the library and the university bookstore. Hence, all subjects in the curriculum are provided with corresponding up-to-date teaching materials, elaborated either by the course titular professors (and published, under the aegis of the university, by CNCSIS-quoted publishing houses) or by outstanding experts in the field - reference works used in the whole academic system. Apart from textbooks and other materials, the University library also provides other books, treaties, magazines, received from American universities, as well as other materials elaborated by professors not related to the faculty.

For the assessment of the students, the *School of Computer Science for Business Management* applies the methodology of the *Romanian-American University*, included in the Regulations on the professional activity of students and it relies on two criteria: attendance and performance.

Each academic year, the curriculum provides minimum *60 transferable study credits*, namely 30 credits per semester. The curricula provide for *6 semesters*. The academic year is divided into *2 semesters, each one having typically 14 weeks (the 3rd semester has 11 weeks, 3 being allocated to the internship, and the 6th semester has 12 weeks, 2 being allocated for completion of the graduation paper)*. Thus, in the first three semesters, regardless of the ROMANIAN-AMERICAN UNIVERSITY School of Computer Science for Business Management Bachelor in Computer Science for Economics TAUGHT IN ENGLISH curriculum, students study a set of subjects that are present in the basic training of an economist:

Microeconomics

Macroeconomics

Econometrics

Communication and Public Relations

Fundamentals of Marketing

English and Communication Techniques

Public Finance and Corporate Finances

Fundamentals of Accounting

Management

Statistics

Mathematics for economics

The Computer Science for Economics Bachelor Program includes the following subject matters:

Algorithms and Data Structuring

Computer Architecture and Operating Systems

Object Oriented Programming

ICT – Information and Communication Technology

Software Programming

Databases

Web Programming

Advanced Web Programming

Networking and Internet

JAVA - Advanced Programming

IT System Design

Operational Research

ORACLE DBMS – SQL

Graphics and Multimedia

The students in the second year undertake different internships of 3 weeks (at the end of the second semester) in specialized organizations or in different companies.

According to their content, during the first and second years of study, basic subjects and the economic training prevail and starting with the third year of study, specialized subjects gain more room, in line with legal requirements.

The *curriculum* includes, *compulsory*, *optional* (starting with the second year of study) and *facultative disciplines*, *split in basic subjects*, *specialized subjects*, *field subjects* and *supplementary subjects*. Optional subjects are grouped together in pathways providing the students with additional training to the study program they select in the first year. Students choose, at the end of their first year, the route of optional subjects to study until the end of the bachelor program.

## **Curriculum**

### *Compulsory Subjects*

#### **Microeconomics**

*5 credit points, 2 hour course, and 2 hour seminar*

The discipline introduces essential principles to the understanding of the specific problems in the economic field as a whole and of the concept of alternative economic policies. In the classes, it will be introduced an appropriate language, specific knowledge and basic concepts used in the practice of business, with the aim to identify specific economic programming and learn the theoretical concepts of modern economic models.

Students will learn about specific components of economic systems. The course will highlight the importance and content of the main types of economic organization, the centralized economy and the market economy, providing in-depth understanding of the concept of global economy. Students will acquire skills for effective use of elements and concepts learned in current activity.

#### **Algebra**

*6 credit points, 2 hour course, and 2 hour seminar*

Consolidating the student's logical skills and creating the background for the study of Mathematical Analysis, Numerical Methods, Probability Theory, Operations Research.

#### **Computing algorithms and data structures**

*6 credit points, 2 hour course, and 2 hour seminar*

Learning the fundamentals of programming activity in general, structured programming in particular, developing the algorithmic thinking. Learning the concepts of algorithms and methods of representing them, data organization, and data structures. Students are required to develop and teach, according to the announced scheduling over the course, homework, consisting in solving problems, completed by programs implemented in a programming language: BASIC / PASCAL, another programming language or pseudo code.

### **Computer architecture and operating systems**

*5 credit points, 2 hour course, and 2 hour seminar*

Learning the basic concepts of design, construction and operation of personal computers. For this purpose it is undergoing structural and functional principles of the fundamental concepts of PCs and operating systems MS-WINDOWS, UNIX, LINUX, occurring in different variations and versions of the software market.

It is also presented the network functionality for operating systems and servers' roles in computer network, together with cloud computing concepts.

### **Public finances and corporate finances**

*5 credit points, 2 hour course, and 1 hour seminar*

The discipline presents the main knowledge fund that constitutes the content of public finance and the accumulation of necessary knowledge for students' understanding of the specific phenomena of public finance in the market economy. It offers profound understanding and application through case studies of the knowledge acquired in the course.

### **English and communication techniques I**

*3 credit points, 2 hour seminar*

The seminar is designed to equip students with the economic English required for their future work in International Business environment, addressing topics (The Business Environment, Company Structure, Jobs and Responsibilities) that are closely related to other subjects in the students' bachelor programs. In the future professional life, students will realize that the greatest part of the job is about communicating, where the main goal is to inform, influence and convince. The students will acquire competencies regarding the professional communication in the field of economics and the English grammatical structures, vocabulary and ESP.

### **Macroeconomics**

*5 credit points, 2 hour course, and 1 hour seminar*

The students will acquire skills in identifying potential sources of documentation and the practical ability to use both analytical and synthetic information about economic activity and economic system. They will learn the skills necessary to apply knowledge at the workplace in the economic field. Students will acquire knowledge on economic policies and economic planning. They will acquire skills for making documentary studies on the factors that generate and characterize the evolution of the economic system.

### **Mathematical analysis**

*5 credit points, 2 hour course, and 2 hour seminar*

Consolidating the student's logical skills and creating the background for the study of Numerical Methods, Probability Theory, Operations Research; direct applications in microeconomics and Macroeconomics, Finance, etc.

### **Object Oriented Programming**

*5 credit points, 2 hour course, and 2 hour seminar*

Learning the fundamentals of object-programming activities, learning concepts of objects, classes and their features. Students are required to develop and deliver, according to the announced

scheduling over the course, homework, consisting in solving problems, completed by programs implemented in Visual Basic programming language.

### **ICT-information and communication technology**

*4 credit points, 2 hour course, and 2 hour seminar*

The objectives of the discipline are to assimilate the most important concepts and techniques using the office and informational systems of communication. The main applications for MS Office are presented, such as: text processing, table processing, graphical presentations and communication programs. It will track students' skill acquisition of economics problems by modeling spreadsheet, to synthesize the information, its presentation in the form of graphics, simulation, optimization and forecasting.

### **Accounting**

*5 credit points, 2 hour course, and 2 hour seminar*

Fundamentals of Accounting are meant to provide theoretical and methodological skills in accounting area and give coherent expression of the main concepts, relationships and techniques for accounting by recording, calculating, analyzing and controlling the movement of economic value. The course's main objective is to familiarize students in solving practical work training for students seeking the skills necessary logic cycle accounts and accounting data processing.

### **Law**

*3 credit points, 2 hour course*

Designed and conceived as an integral part of the specialized training, the discipline „Law” offers to students indispensable knowledge in order for them to master the legal regulations, as a prerequisite in their future capacity of economic agents. The course focuses on the major legal institutions of civil law which regulate the economic spectrum and underlie the flow of value in society. The course topic tends to pass on to the future economists the social, political and normative content of legal regulations and to form skills in order for them to apply legal standards in concrete situations. The „Law” course is designed on the basis of the current legislation, on Romanian and foreign legal literature as well as on judicial practice.

### **English and communication techniques II**

*3 credit points, 2 hour seminar*

The seminar is designed to equip students with the economic English required for their future work in International Business environment, addressing topics (The Business Environment, Company Structure, Jobs and Responsibilities) that are closely related to other subjects in the students' bachelor programs. In the future professional life, students will realize that the greatest part of the job is about communicating, where the main goal is to inform, influence and convince. The students will acquire competencies regarding the professional communication in the field of economics and the English grammatical structures, vocabulary and ESP.

### *Compulsory Subjects*

### **Software programming I**

*5 credit points, 2 hour course, and 2 hour seminar*

Knowledge of programming opportunities in the C++ application software development. Elements of programming languages C/C++: constants, variables, identifiers, classes of memory, representations. Operators and expressions. Implementation of the fundamental programming structures. Pointers and arrays. Strings.

Functions. The mechanism of parameters transmission. Pointers to functions. Recursion. C++ Standard Libraries.

User-defined data types. Preprocessor directive.

### **Databases I** *5 credit points, 2 hour course, and 2 hour seminar*

Study and knowledge of methods, techniques and tools used in the analysis, design, implementation of Computer Science application with databases in different social and economic domains.

Knowledge and use of DBMS Relational FOXPRO on database users and DBMS and 4GL programmers.

### **Web applications programming**

*5 credit points, 2 hour course, and 2 hour seminar*

Providing the theoretical and practical knowledge in order for students to be able to design and develop web pages and to integrate them into dynamic client-server architecture. Basic concepts of the web environment, the ISO OSI model structured as a hierarchy of protocols. The HTML language, 4.01 standard specifications; use of HTML as a basic language for web page development CSS 2 specifications presentation and use Implementation and use of JavaScript language for audio/video/interactive effects. Presentation of different tools for web development.

### **Theoretical and economical statistics**

*4 credit points, 2 hour course, and 2 hour seminar*

The purpose of Statistics is to give students, primarily those in the field of business, a conceptual introduction to the field of statistics and its many applications into the business field. The course is application oriented and provides good preparation for the study of more advanced statistics and econometric courses. The students will be able to summarize data in insightful ways using charts, graphs, and summary statistics, as well as make inferences from samples, especially about relationships.

### **Corporate management**

*5 credit points, 2 hour course, and 1 hour seminar*

Providing knowledge to students concerning the concepts and specific components of the modern management. Training and development of skills, abilities and behavior management requirements appropriate for a dynamic and efficient organizational activity and for the needs of modern market economies, with emphasis on innovation, creativity and entrepreneurial spirit. Development of a systematic way of thinking, based on the company approach closely interdependent with its ecosystem, to assure a sustainable development.

### **English and commercial correspondence I**

*3 credit points, 2 hour seminar*

This business English course focuses on speaking practice and vocabulary expansion for business professionals and university students with ambitions to work in business or professional fields where contact with colleagues and customers from abroad is expected (intra-organizational communication). Topics and vocabulary are specifically selected to provide English vocabulary and sentence structure that is immediately useful to the student.

### *Elective Subjects:*

#### **Numerical methods**

*4 credit points, 2 hour course, and 1 hour seminar*

Applied mathematics, wherefrom there is also numerical analysis, has developed last decades' grace of the large using of computing electronic systems for solving problems demanded by practice. The

range of numerical methods is of big theoretical and practical importance, being at the crossing of mathematics with computing technique. Apparently a pure mathematical domain, numerical methods have an important appliance in Computer Science and a direct link to economic one. As synthesis of main numerical computing methods, the course of “Numerical Methods” is dedicated for Computer Science students – economists who solve by the meaning of computers, problems of applied mathematics in economy.

### *Compulsory Subjects*

#### **Software programming II**

*5 credit points, 2 hour course, and 2 hour seminar*

Object oriented programming concept acquisition and implementation of specific mechanisms in C++.

#### **Databases II** *5 credit points, 2 hour course, and 2 hour seminar*

Knowledge of relational designing model. Knowledge of designing relational databases techniques. Designing and developing database applications. Knowledge and use of DBMS ACCESS 2010. Designing of Web Site databases solution.

#### **Advanced web programming**

*5 credit points, 2 hour course, and 2 hour seminar*

Advanced web programming teaches students to design and build Web pages, applications and integrate them into dynamic client-server architecture, with the most modern and most used tools in the field: PHP and MySQL.

#### **Econometrics**

*4 credit points, 2 hour course, and 2 hour seminar*

The purpose of Econometrics course is to give students, primarily those in the field of business, an introduction of basic econometric techniques employed by economists in the analysis of economic relationships. The course is oriented towards applications for econometric techniques and the interpretation of estimated results rather than formal theoretical proofs and derivations. The students will be able to build, interpret and evaluate an econometric model.

#### **Networking and Internet**

*4 credit points, 2 hour course, and 2 hour seminar*

Learning basic concepts of design, construction and operation of computer network. For this purpose it is undergoing structural and functional principles of the fundamental concepts of computer network and server operating system, occurring in different variations and versions of the equipment and software market.

#### **English and commercial correspondence II**

*4 credit points, 2 hour seminar*

This business English course focuses on speaking practice and vocabulary expansion for business professionals and university students with ambitions of working in business or professional fields where contact with colleagues and customers from abroad is expected (intra-organizational communication). Topics and vocabulary are specifically selected to provide English vocabulary and sentence structure that is immediately useful to the student.

#### **Specialized internship**

*3 credit points, total 90 hours*

The purpose of the specialized internship is to know the economic entities in which future graduates will work and to shape the decision on choosing the theme of thesis. In this way students will take the options on the field in which future graduates will work as an economist and fixing the knowledge acquired in courses and seminars.

*Elective Subjects:*

### **Macroeconomics statistics**

*4 credit points, 2 hour course, and 2 hour seminar*

Quantitative analysis of fundamental macroeconomic phenomena. Analysis of basic indicators that measure the economic potential of a country. Methodologies for calculating different indicators and analyzing macroeconomic correlations.

### **Regional economic accession**

*5 credit points, 2 hour course, and 1 hour seminar*

The discipline offers an overview of regional economic accession agreements at the global level and evaluates their process. This course emphasizes the effects of regional economic accession by using the successful cases at the global level and points out the effects of creating the European Union, mainly at the microeconomic level.

*Compulsory Subjects*

### **Java advanced programming environments**

*6 credit points, 2 hour course, and 2 hour seminar*

Provides the students with the possibility of developing independent JAVA applications, highly portable on a wide range of technological platforms. It also teaches the students how to integrate into their web sites the most modern and appreciated scripts and programs (applets). Teaches the students the basic elements for developing applications for almost every IT device available, such as mobile phones, smart phones, PDSs, laptops, desktops, tablets etc.

### **IT systems design**

*6 credit points, 2 hour course, and 2 hour seminar*

Training students in the analysis, design, implementation, maintenance and development of management systems for specific activities of companies and elsewhere in the economy. Learning the general concepts of data modeling and processing, logical and physical modeling, designing a computer system or computer application using systemic methods. IBM and SSADM design methodologies are studied in detail.

### **Operational research**

*6 credit points, 2 hour course, and 2 hour seminar*

Introducing students to concepts of the Operational Research. Initiating them into classes of economic problems that use mathematical models for optimizing decisions and a wide range of problem-solving techniques and methods applied in the pursuit of improved decision-making and efficiency. Using specialized software packages for optimization problems, queuing theory, game theory, graph theory, decision analysis, mathematical modeling and simulation.

### **EU Law**

*4 credit points, 2 hour course, and 1 hour seminar*

This course provides an overview of the former so-called ‘first pillar’ of the European Union on the basis of the European treaties as currently established, and with reference to the changes made by the Lisbon text. It covers, in short, the values, principles, options that EU law shall pursue and their

impact on the decision-making structures, procedures and legal instruments, as well as the actors/legal subjects, the mechanisms, procedures and instruments it opens and develops itself.

### **Business Communication in English I**

*3 credit, 1 hour course, and 2 hour seminar*

This English course is closely tailored to the professional language of International Business, paying particular attention to the specific terminology pertaining to the business world. Presentation and communication skills will be developed throughout the course, and the students should learn to master formal written and oral communication in English. In addition to the business English material, particular focus will be given to developing the students' skills in academic writing, equipping them with necessary competence for their further academic studies. Students will build vocabulary and communication skills in a practical business context (inter-organizational communication, intercultural communication and negotiations). Exercises include oral and written activities such as writing business letters, reports, e-mails, communicating over the telephone and in meetings, making presentations and speeches etc.

### **Projects I graduation paper drafting**

*5 credit points, 2 hour project seminar*

The discipline provides the curriculum for students in the third year of study and it mainly aims to guide and support students in the large and laborious task of documentation, design, implementation - of software testing and development - writing - presentation of bachelor's degree paper. In these lab hours the students have the opportunity to make a documentary on the Internet broader university laboratories, to design - write and test software products and software on a hardware platform for both software implementation and breakdowns on the rules drafting and presentation of the diploma. Department colloquia are finalized by the end of each semester. This area is part of the disciplines included in the curriculum. Assessment of student performance is based on verification activities during the year.

### *Elective subjects*

#### **Advanced software programming**

*4 credit points, 2 hour course, and 1 hour seminar*

Advanced programming in C++: Design and implementation of dynamic data structures.

### *Compulsory Subjects*

#### **ORACLE DBMS - SQL**

*6 credit points, 2 hour course, and 2 hour seminar*

Provides students training for designing and developing information systems with databases managed by Oracle DBMS. Presents the working and developing mode for applications using Oracle 10g DBMS; the communication language between database and SQL\*PLUS, SQL (Structured Query Language) application, PL/SQL overview.

#### **Graphics and multimedia**

*6 credit points, 2 hour course, and 2 hour seminar*

Learning of concepts related to creating and publishing multimedia documents on websites. Students will develop their capacity for analysis and synthesis through the development and delivery, according to the announced phased over the course of the works mentioned in the list of individual works of the curriculum.



### **Fundamentals of marketing. Marketing strategies and policies**

*5 credit, 2 hour course, and 1 hour seminar*

Study the fundamental marketing concepts at work in today's business environment. The role of marketing in society and business activities. Marketing institutions, marketing functions, analysis of marketing environment components. Relation between policies – strategies and marketing tactics. Developing marketing mix strategies and objectives and relating them to the overall strategic marketing plan. Marketing strategy design and implementation, assessment and control of marketing programs.

### **Economic processes modeling and simulation**

*5 credit, 2 hour course, and 1 hour seminar*

Nearness to the true structural qualities and relations of economic reality is a continuous process of development of flexible economic-mathematical models. The problems approached within the course, case studies and economic analyses are useful both for students of economic domain and for experts from economic organizations, whatever their profile or size. Through elasticity of used models and the numerous possibilities of economic analysis given by Computer Science products, student gets to understand what's it like to take a well-founded quantitative decision.

### **Business Communication in English II**

*3 credit, 1 hour course, and 2 hour seminar*

This English course is closely tailored to the professional language of International Business, paying particular attention to the specific terminology pertaining to the business world. Presentation and communication skills will be developed throughout the course, and the students should learn to master formal written and oral communication in English. In addition to the business English material, particular focus will be given to developing the students' skills in academic writing, equipping them with necessary competence for their further academic studies. Students will build vocabulary and communication skills in a practical business context (inter-organizational communication, intercultural communication and negotiations). Exercises include oral and written activities such as writing business letters, reports, e-mails, communicating over the telephone and in meetings, making presentations and speeches etc.

### **Projects II – graduation paper drafting**

*5 credit points, 2 hour project seminar*

The discipline provides the curriculum for students in the third year of study and it mainly aims to guide and support students in large and laborious tasks of documentation, design, implementation - of software testing and development - writing - presentation of bachelor's degree paper. In these lab hours the students have the opportunity to make a documentary on the Internet broader university laboratories, to design - write and test software products and software on a hardware platform for both software implementation and breakdowns on the rules drafting and presentation of the diploma. Department colloquia are finalized by the end of each semester. This area is part of the disciplines included in the curriculum. Assessment of student performance is based on verification activities during the year.

### *Elective Subjects*

#### **Investments efficiency**

*4 credit, 2 hour course, and 1 hour seminar*

Students will learn about a theoretical knowledge system and practical methods and techniques for economic and financial assessment of investment projects in the market economy; Formation of a new and logical thinking of the future economists; To develop students' skills in evaluative

investments in order to use the methods and models for analyzing investment opportunities and making investment decisions.