

# ROMANIAN –AMERICAN UNIVERSITY

Accredited by the Law no. 274 / May, 15 2002

University rated with **High Confidence** by Romanian Agency for Quality Assurance in Higher Education



## **STUDY GUIDE**

### **BACHELOR PROGRAM**

### **Computer Science for Economics**

**2016 – 2017**

**Faculty of Computer Science for Business Management**



**YOUR FUTURE IS STARTING HERE!**

**The Faculty of Computer Science for Business Management** was founded in 1991 as a successful alternative to public education and has been accredited by the Law no. 274 / May, 15 2002 on the incorporation of the Romanian-American University. The Bachelor Program **Computer Science for Economics** underwent regular assessment by the **Romanian Agency of Quality Assurance in Higher Education** in February 2011, which granted a **"trust" qualification to accreditation** for full time studies.

The bachelor program "**Computer Science for Economics**" falls within the fundamental domain of "Economic Science", field of study "**Cybernetics, Statistics and Computer Science for Economics**", major in "**Computer Science for Economics**".

**The Faculty of Computer Science for Business Management** is a member of the **Association of Economic Faculties from Romania**.

**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 to recognized both nationally and internationally.

The 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 **Faculty 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; data basis administrator; computer network administrator; web-site administrator; developer of decision assisting systems and expert systems; IT consultant; etc.

The Faculty's members meet the legal requirements, in that all teachers and lecturers have a PhD title, lecturers have obtained their PhD title or are PhD students and the teaching assistants and junior assistants have master studies, certified teaching training, part of them being PhD students.

The **curriculum** includes, starting with the second year of study, **compulsory, optional and facultative disciplines**, grouped 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.

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.

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 of 14 weeks**. Thus, in the first three semesters, regardless of the curriculum, students study a set of subjects that are present in the basic training of an economist:

- Microeconomics
- Algebra
- Public Finances and Corporate Finances
- English and Communication Techniques
- Macroeconomics
- Mathematical Analysis
- Accounting
- Law
- Theoretical and Economic Statistics
- Corporate Management
- Econometrics
- Fundamentals of Marketing Bases. Marketing Policies and Strategies

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
- Data Bases
- 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 in specialized organizations or in different Romanian companies or in Microsoft Innovation Center – Romanian-American University.

Supplying teaching materials for all subjects is a constant concern of the faculty board and specialty departments which analyze annually the need for textbooks and their availability in the library and the bookstore of the university. 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 in Romania and/or abroad).

Apart from textbooks and other materials, the RAU library also provides other books, treaties, magazines, received from American universities, as well as other materials elaborated by professors not related to the faculty or official software corporations' materials (e.g. Microsoft, Oracle, IBM).

For the evaluation of the students, the Faculty 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*.

Scientific research undertaken at the level of the MA study module *Computer Science for Economics* relies on the **Programme of scientific research** of the Faculty of Computer Science for Business Management and pursues its major objectives, as well as those of 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, URA-INFORTIS, The Center of Research, in IT&C and Artificial Intelligence URA-CCTIC**. Teaching staff belonging to the *Computer Science for Economics* module are or have been involved in tens of research projects.

The building of the Romanian-American University is modern and functional, adapted to the requirements of a modern and efficient educational process.

The educational areas, including lecture halls and seminar rooms, are equipped with modern furniture and technical equipment specific to the educational process (sound equipment, video-projectors) and the labs are supplied with the latest soft products, the students being able to access the internet. We can also mention printers, photocopiers which are always available to students. Likewise, in order to improve the communication relations among the management – administration – students, the university is equipped with an info-touch gadget that is equally available to all students. Also, Romanian-American University is part of academic programs of major software corporations and provide to it students free access to a large variety of software products.

They can also benefit from the services of the university **library** (classic or virtual) by means of the bookstore and the reading halls where they can find the specialty works recommended in the curricula, as well as other titles that are useful for further study – each of them counting more than 250 seats. The library includes over 55,950 volumes, 75% of them refer to economics, thus fully covering all the subjects in the curriculum. Over 60% of the books/courses are recent publications from the past 5 years.

# Study Guide

## Computer Science for Business Management

### 1st year, 1st semester

#### Compulsory Subjects

##### Microeconomics

4 credit points, 2 hours course, and 2 hours seminar/week

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.

##### Algorithms and data structuring

5 credit points, 2 hours course, and 2 hours laboratory/week

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, 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 pseudocode.

##### Computer architecture and operating systems

5 credit points, 2 hours course, and 2 hours laboratory/week

Learn 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.

##### Economic information systems

4 credit points, 2 hours course, and 2 hours laboratory/week

The objectives of the discipline are to assimilate the most important concepts and techniques using the office and communication information systems. The main applications for office are presented, such as: text processing, tables processing, graphics presentation and communication programs.

##### Object Oriented Programming

5 credit points, 2 hours course, and 2 hours seminar/week

Learning the fundamentals of object-programming activities, learning concepts of objects, classes and their characteristics. 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.

## **Fundamentals of accounting**

4 credit points, 2 hours course, and 2 hours seminar/week

Fundamentals of accounting are meant to provide theoretical and methodological skills in accounting area and gives coherent expression of the main concepts, relationships and techniques for accounting 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.

## **English and communication techniques I**

3 credit points, and 2 hours seminar/week

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 future working life, students will realize that the greatest part of the job is about communicating, where the main goal is to inform, influence and convince.

## **1st Year, 2nd Semester**

### **Macroeconomics**

4 credit points, 2 hours course, and 1 hour seminar/week

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.

### **Public finance**

5 credit points, 2 hours course, and 1 hour seminar/week

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.

### **Algebra**

5 credit points, 2 hours course, and 2 hours seminar/week

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

### **Mathematical analysis**

5 credit points, 2 hours course, and 2 hours seminar/week

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.

### **Statistics**

5 credit points, 2 hours course, and 2 hours seminar/week

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 business field. The course is applications-oriented and provides good preparation for the study of more advanced statistics and econometric courses.

## **Law**

3 credit points, 2 hours course/week

Designed and conceived as an integral part of the specialized training, the discipline „Law”, offers 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.

## **English and communication techniques II**

3 credit points, 2 hours 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 future working life, students will realize that the greatest part of the job is about communicating, where the main goal is to inform, influence and convince.

## **2nd year, 1st semester**

### **Compulsory Subjects**

#### **Software programming I**

5 credit points, 2 hours course, and 2 hours seminar/week

Knowledge of programming opportunities in C ++ application software development

#### **Data bases I**

5 credit points, 2 hours course, and 2 hours seminar/week

Studying and acknowledge of methods, techniques and tools used in the analyze, design, implementation of informatics application with databases in different social and economic domains.

#### **Web applications programming**

5 credit points, 2 hours course, and 2 hours seminar/week

Providing the theoretical and practical knowledge in order for the students to be able to design and develop web pages and to integrate them into dynamic client-server architecture.

#### **Fundamentals of marketing**

4 credit points, 2 hours course, and 1 hour seminar/week

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 with emphasis on consumer behavior and marketing information system.

#### **Management**

4 credit points, 2 hours course, and 1 hour seminar/week

The discipline emphasizes the fundamental core of knowledge which comprises the content of modern management. The course will help students to develop a systemic thinking and will facilitate the creation of a modern managerial conception, useful in managing knowledge based organizations in a globalized economy. It also helps in forming and developing of rational, ethic and moral abilities, skills and managerial conducts.

## **English and commercial correspondence I**

3 credit points, 2 hours seminar

The students will acquire competencies regarding the professional communication and commercial correspondence in the field of economics, in English. The acquiring of the English grammatical structures and specific language for the commercial correspondence

## **Elective subjects**

### **Numerical methods**

4 credit points, 2 hours course, and 1 hour seminar/week

The discipline emphasizes the fundamental core of knowledge which comprises the content of modern management. The course will help students to develop a systemic thinking and will facilitate the creation of a modern managerial conception, useful in managing knowledge based organizations in a globalized economy. It also helps in forming and developing of rational, ethical and moral abilities, skills and managerial conducts.

### **Corporate finance**

4 credit points, 2 hours course, and 2 hours seminar/week

Understanding the financial position of the company and its place in the circuit financially. Knowledge and learning the theoretical aspects related to financial decision analysis financial performance and financing company in the short, medium and long term.

## **2nd year, 2nd semester**

### **Compulsory Subjects**

#### **Software programming II**

5 credit points, 2 hours course, and 2 hours seminar/week

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

#### **Data bases II**

5 credit points, 2 hours course, and 2 hours seminar/week

It is presented the fundamentals of relational designing model, designing relational databases techniques and designing and developing database applications.

#### **Advanced web programming**

5 credit points, 2 hours course, and 2 hours seminar/week

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 hours course, and 2 hours seminar/week

Creating abilities for analysis and prognosis of the evolution of economic variables and for identifying their mutual dependencies.



## **Networking and internet**

4 credit points, 2 hours course, and 2 hours seminar/week

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**

3 credit points, 2 hours seminar

The students will acquire competencies regarding the professional communication and commercial correspondence in the field of economics, in English. The acquiring of the English grammatical structures and specific language for the commercial correspondence

## **Specialized internship**

3 credit points, 90 hours projects

Internship is part of the curriculum subjects, the scores obtained of colloquium is the condition to promote of the school year and is part of general averaging.

## **Elective subjects**

### **Macroeconomic statistics**

4 credit points, 2 hours course, and 1 hour seminar/week

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

### **International commercial law**

4 credit points, 2 hours course

Knowledge of legal international trade law, amid international economic relations and trade volume growth in global economic

## **3rd year, 1st semester**

### **Compulsory Subjects**

#### **JAVA – advanced programming**

5 credit points, 2 hours course, and 2 hours laboratory/week

The course objective is to provide the students the possibility of developing independent JAVA applications, highly portable on a wide range of technological platforms, the basic elements for developing applications for almost every IT device available, such as mobile phones, smart phones, PDSs, laptops, desktops, tablets etc. Knowledge of programming opportunities in C ++ application software development.

## **Information systems design**

6 credit points, 2 hours course, and 2 hours laboratory/week

Training students in the analysis, design, implementation, maintenance and development of management systems for specific activities of companies and elsewhere in the economy. The course also is targeting 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**

5 credit points, 2 hours course, and 2 hours seminar/week

The course introduces students to concepts of the Operational Research. Initiating them into classes of economic problems that use mathematical models for optimization decision 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.

## **European Union law**

5 credit points, 2 hours course, and 1 hour seminar/week

This course is intended for students who have no knowledge of law. The course examines the evolution of the European Economic Community established to create a common market by the European Union with objects from a political and social. The course objective is twofold: to understand the development of 'social constitution' of the EU and understand the process and labor market regulations as a transnational course.

## **Business English communication I**

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

The students will acquire competencies regarding the professional communication in English, in the field of economic IT. The acquiring of the English grammatical structures specific to the communication process in the economic IT field.

## **Projects I – Bachelor project preparation**

5 credit points, 2 hours project/week

The discipline provides the curriculum for three-year students, mainly aims to guide and support students in large and laborious task of documentation, design, implementation - of software testing and development - writing - presentation of bachelor's degree paper. In these hours of lab 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.

## **Elective subjects**

### **Advanced software programming**

4 credit points, 2 hours course, and 1 hour seminar/week

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

### **International Business Management I**

5 credit points, 2 hours course, and 2 hours seminar/week

Discipline is addressed primarily to those who want a career in economic international relations, having a rich interdisciplinary content course International Business Management addresses the most important aspects of conducting foreign economic activities.

## 3rd year, 2nd semester

### Compulsory Subjects

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

5 credit points, 2 hours course, and 2 hours laboratory/week

The course 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 and the communication language between database and SQL\*PLUS, SQL (Structured Query Language) application.

#### **Graphics and multimedia**

5 credit points, 2 hours course, and 2 hours laboratory/week

The course objective is learning of concepts related to creating and publishing multimedia documents on the Web sites.

#### **Economic processes modelling and simulation**

5 credit points, 2 hours course, and 1 hour seminar/week

*Economic process modelling and simulation* is an economic branch bordering to economy of organization, mathematics and informatics and gives a large amount of management methods and techniques for foundation management decision in efficiency conditions by the means of flexible economic-mathematic models and having possibility of using simulation technique.

#### **Business English communication II**

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

The students will acquire competencies regarding the professional communication in English, in the field of economic IT. The acquiring of the English grammatical structures specific to the communication process in the economic IT field.

#### **Projects II – Bachelor project preparation**

5 credit points, 2 hours project/week

The discipline provides the curriculum for three-year students, mainly aims to guide and support students in large and laborious task of documentation, design, implementation - of software testing and development - writing - presentation of bachelor's degree paper. In these hours of lab 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.

### Elective subjects

#### **Informatics project management**

5 credit points, 2 hours course, and 1 hour seminar/week

The course objective is acquiring by students of methodology for the management of ICT projects for developing project proposals for domestic/international calls, the PMBOK guide and PRINCE 2 methodology

#### **International business management II**

6 credit points, 2 hours course, and 2 hours seminar/week

Discipline is addressed primarily to those who want a career in economic international relations, having a rich interdisciplinary content course International Business Management addresses the most important aspects of conducting foreign economic activities.