

ROMANIAN-AMERICAN
UNIVERSITY



ACCREDITED BY LAW 274/MAY 15, 2002

2020-2021

STUDY GUIDE

*Study program
master*

Computer Science for Business



**YOUR CHOICE, YOUR FUTURE,
CHOOSE TO BE THE BEST!**

School:

**COMPUTER
SCIENCE for
BUSINESS**

MANAGEMENT

SCHOOL OF COMPUTER SCIENCE FOR BUSINESS MANAGEMENT



STUDY GUIDE 2020 - 2021

MASTER STUDY PROGRAM: COMPUTER SCIENCE FOR BUSINESS

PART I:

ROMANIAN-AMERICAN UNIVERSITY OVERVIEW

The Romanian-American University (RAU) is a higher education institution, a legal person of private law and public utility, part of the national system of education, founded in 1991, accredited by law in 2002, receiving the qualification “High confidence rating” from ARACIS (Romanian Agency for Quality Assurance in Higher Education) since 2010, whose mission is to offer high quality education and research, in an intellectually stimulating environment both for students and for the teaching staff. All bachelor and master studies programs, offered by the seven schools of RAU (Computer Science for Business Management; Domestic and International Business, Banking and Finance; Domestic and International Tourism Economics; European Economic Studies; Management-Marketing; Law; Physical Education, Sport and Kinesiotherapy) are accredited and ranked by the national Ministry of Education among the first categories since 2011.

The **mission** of the Romanian-American University consists in *education, teaching, scientific research and innovation, the cultivation of scientific values and of universal culture in general, especially in the fields of economics, law and sport.*

Through its mission, the university means to contribute to:

- the promotion of excellence in education, scientific research, innovation and technological transfer, as well as of professional, moral and social responsibility and of creativity in the fields of competence;
- the treasuring and promotion of values of national and universal culture and civilization;
- the defense of an academic democratic framework based on university autonomy and respect for the law, on the fundamental human rights and liberties in the state of law.

According to the Charta, the fulfilment of the mission of the Romanian-American University may be achieved through:

- the formation of specialists with superior training in the fundamental fields of science in which the university organizes bachelor, master and doctoral studies programs, which are authorized or accredited according to the law;
- the carrying out of specific fundamental scientific research and applicative activities, through the specialized departments, centers and research LABies as well as other organization bodies;
- entrepreneurial activities which comprise consultancy programs, specialized assistance, business incubators etc.;

- the affirmation of academic/didactic and scientific achievements of community members through participation in reunions, scientific events etc. organized at national and international levels;
- ongoing learning through post-academic studies, trainings etc.;
- professional formation through education programs carried out in Romanian or in widely used international languages and mobility programs, in agreement with the law.

VISION of RAU

In promoting a particularly strategic academic management, the Romanian-American University sets for itself as an objective its national and international recognition as an elite university.

VALUES of RAU

- The promotion of excellence;
- Professional, moral and social responsibility;
- Freedom of thought and speech;
- Creativity and innovation;
- Cooperation and communication.

Through the promotion of value in education, research and innovation, our university will lastingly consolidate its position at a national and international level, being a partner for the community which it is part of, placing at the center of its concerns life improvement and experience enhancement for the main beneficiaries of its activity: students, alumni, teaching staff and administrative personnel.

STRATEGIC OBJECTIVES of RAU

The main general strategic objectives which result from the mission, vision and values of the Romanian-American University are:

O.1. boosting national and international recognition for the quality of its educational and professional formation activities;

O.2. the support and consolidation of research-innovation activities and dissemination of results through measures adapted to individual and collective needs;

O.3. the development of value and partnership with students, alumni, teaching staff and administrative personnel and with other partners and components of the academic community;

O.4. the consolidation of the partnership with representatives of the economic-social environment, employers and other components of society;

O.5. increase of the degree of internationalization of the university on the academic and administrative layers;

O.6. increase of the quality and effectiveness of academic processes in relation with various categories of relevant public from the internal and external environments;

O.7. the development of entrepreneurial culture and sustainable university vision.

The mission and the objectives assumed by RAU individualize the university within the Romanian National System of Higher Education through **clarity, distinction and focus**. The general strategy of RAU focuses on **real** integration within the European educational framework and the **internationalization** of teaching and research activities.

Under the conditions of adopting the educational values of the European and American higher education systems, **scientific research** in RAU becomes a defining condition for its affirmation and existence.

International experience constitutes an essential component of student education and teaching staff training. RAU has **accords and memorandums with universities and other prestigious entities from USA, Europe, South America, Australia and Asia**. Numerous inter-academic exchanges for students and faculty are deployed through these partnerships, aiming to permanently adapt and implement values of the higher education systems from USA and Europe, in order to raise the standards of quality and competitiveness of the educational process.

Each year, RAU organizes international summer schools in partnerships with James Madison University (USA), University of Alabama in Huntsville (USA) and other international partners. RAU students benefit from scholarships to study all over the world. The international component of the student life comprises, besides scholarships to study abroad, participation at interactive classes taught by prestigious professors from all over the world, online courses, scientific events, summer schools, international meetings etc. – all these things aiming to increase the horizon of our students through an international approach, a possibility to globally apply what they learn and, also, to obtain different certificates attesting their experience and expertise.

Considered as the best private university in Romania (according to the “University Ranking” study done by the German company Kienbaum Management Consultants in cooperation with the Capital magazine) RAU’s international relations are a key component of its development strategy.

Scholarships, quality of education, parthernship with the business environment, developing general and specialy competences required by the employers and implicitly the guarantee of a fast insertion on the labour market, represent distinctive characteristics of RAU, which provide a competitite advantage for the university.



An essential condition for fulfilling its assumed mission and objectives regarding teaching, scientific research and efficient administration, is represented by the existence of a modern campus, meeting all the requirements of the higher education field.

RAU has a vast number of dedicated spaces for: educational activities, scientific research and administrative offices. All spaces are equipped with technical equipment, computers, didactic materials, software, internet access, intranet space and access to the library.



With a surface of over 34.500 m², the **Campus** comprises: an Aula Magna, amphitheatres, lecture rooms, scientific research labs and centers, IT labs, forensics lab, international negotiations simulation lab, audio lab, library, medical practice, sport and fitness areas, student club, tourism agency, chapel, technical and administrative offices, hostel with 11 floors, cafeteria – restaurant etc.





Come JOIN US!
Your CHOICE, Your FUTURE!

PART II:

Professional Perspectives

Competences acquired through graduating the master program “Computer Science for Business” correspond to the highest requirements of the labour market in the fields of Economics Informatics and Information Technology. Graduates of this program can usually fill the following positions:

- Analyst-designer of business information systems;
- Consultant in the conception, design and development of computer applications and IT products in the economic and business fields;
- Highly qualified specialist in quality assurance of IT products and information systems;
- Design and management staff in the fields of ERP, SCM and CRM;
- Programmer for advanced programming environments and CASE tools;
- Database administrator;
- Distributed systems designer;
- Consultant in the conception, design and implementation of electronic business;
- Manager in the field of IT projects;
- Specialist economist with specific skills in using IT&C tools.

The general competencies of the graduates of the master's university courses are:

- Interdisciplinary approach to IT issues and extensive capacity to design and develop applications in IT businesses;
- Development of applications in various fields of economic informatics: data warehouses, OLAP, OLTP, data mining, expert systems, neural networks, genetic algorithms, intelligent agents, object-oriented programming and design, development of algorithmic and heuristic methods / procedures;
- Critical analysis of the organization and development of the activity within the design / development team of economics informatics applications;
- Analysis and generation of alternatives based on algorithmic and heuristic methods, based on systemic analysis of complex problems and their connections;
- Creation of continuous training supports for top specialists in the field of economic informatics given the high dynamics of the field;
- Coordination and control of the tasks of the development teams of economic informatics applications.

The specific competencies of the graduates of the master's degree courses are:

- Ability to prepare reports and complex studies necessary for the organization's management, by using modern concepts and methods of analysis and interpretation of economic and social phenomena and processes;
- Ability to evaluate economic and social systems, develop strategies and make decisions through interdisciplinary approach to issues and integrated application of concepts, methods and models specific to economic sciences;
- Ability to use and develop quantitative methods and tools for analyzing and processing information, including systems and software products, for formulating value judgments and substantiating decisions, through procedures specific to statistics and economic informatics;
- Application of advanced methodologies for analysis, design and implementation of structured and object-oriented economic information systems;
- Use of modern technologies for the development of distributed economic applications and programming of mobile devices;
- Use of advanced technologies for database design and management, programming engineering and expert systems;
- Ability to design, develop and implement computer networks and information systems focused on ERP/CRM software solutions;
- Use of concepts, technologies, standards and legislation necessary for the design, implementation, testing and evaluation of complex information systems;
- Use of scientific research methodology, offering consultancy and specialized technical assistance in economics and applied informatics.

PART III:

CURRICULUM (SHORT DESCRIPTION OF DISCIPLINES)

YEAR I. SEMESTER 1 - 14 WEEKS

MANDATORY DISCIPLINES (D.O)

1. GAME DEVELOPMENT WITH 3D-UNITY

HOURS: 42 OUT OF WHICH 14/COURSE AND 28/LAB

CREDITS FOR GRADUATING: 6

EVALUATION PROCEDURE: EXAM

DISCIPLINE OBJECTIVES:

TRAINING AND FAMILIARIZATION OF STUDENTS WITH THE GAME DEVELOPMENT UNITY FRAMEWORK. DIFFERENCES BETWEEN DIFFERENT GAME DEVELOPMENT PLATFORMS. GAMES DEBUGGING, DEPLOYMENT AND TESTING. ANALYSIS OF THE PERFORMANCE OF A GAME.

2. DATABASE APPLICATIONS DEVELOPMENT (ORACLE)

HOURS: 42 OUT OF WHICH 28/COURSE AND 14/LAB

CREDITS FOR GRADUATING: 6

EVALUATION PROCEDURE: EXAM

DISCIPLINE OBJECTIVES:

ENSURES THE PREPARATION OF STUDENTS FOR THE DESIGN AND DEVELOPMENT OF COMPUTER SYSTEMS WITH DATABASES MANAGED BY THE ORACLE DBMS. PRESENTS HOW TO WORK AND TO DEVELOP APPLICATIONS WITH THE HELP OF ORACLE DBMS. LANGUAGE OF COMMUNICATION BETWEEN DATABASE AND APPLICATIONS: SQL*PLUS, SQL (STRUCTURED QUERY LANGUAGE). PL/SQL PROCEDURAL VERSION.

3. MANAGEMENT OF LARGE DATA VOLUMES

HOURS: 42 OUT OF WHICH 28/COURSE AND 14/LAB

CREDITS FOR GRADUATING: 6

EVALUATION PROCEDURE: EXAM

DISCIPLINE OBJECTIVES:

THE COURSE ENSURES THE STUDENTS' ACQUISITION OF A SET OF CONCEPTS, SOPHISTICATED, COMPLEX AND INNOVATIVE ANALYSIS METHODS, PROACTIVE, EXTENSIBLE AND PERFORMANCE ORIENTATED ANALYSIS MTHODS. ALL CONCEPTS ARE EXEMPLIFIED THROUGH EXPORATION OF LARGE DATA REPOSITORIES WHICH CAN PRODUCE USEFUL, RELEVANT AND STRATEGIC INFORMATION REQUIRED FOR OPTIMAL BUSINESS DECISIONS AND MAXIMUM PROFITABILITY.

4. COMPUTER NETWORK STRUCTURES AND CLOUD COMPUTING

HOURS: 42 OUT OF WHICH 28/COURSE AND 14/LAB

CREDITS FOR GRADUATING: 6

EVALUATION PROCEDURE: EXAM

DISCIPLINE OBJECTIVES:

THE COURSE PRESENTS THE ARCHITECTURES, TECHNOLOGIES AND STRUCTURES OF COMPUTER NETWORKS, NETWORK DESIGN AND TROUBLESHOOTING, SECURITY TECHNIQUES.

5. CYBERSECURITY

HOURS: 42 OUT OF WHICH 14/COURSE AND 28/LAB

CREDITS FOR GRADUATING: 6

EVALUATION PROCEDURE: EXAM

DISCIPLINE OBJECTIVES:

PREVENTION OF COMPUTER ATTACKS AND ESTIMATION OF SECURITY VULNERABILITIES IN NETWORKS AND SERVER ENVIRONMENTS. IMPLEMENTING SECURITY POLICIES ON LINUX SERVERS AND CISCO EQUIPMENT.

YEAR I. SEMESTER 2 - 14 WEEKS

MANDATORY DISCIPLINES (D.O)

1. BUSSINESS INTELLIGENCE

HOURS: 42 OUT OF WHICH 28/COURSE AND 14/LAB

CREDITS FOR GRADUATING: 6

EVALUATION PROCEDURE: EXAM

DISCIPLINE OBJECTIVES:

PRESENTATION OF MAIN CONCEPTS, METHODS AND TECHNIQUES OF MODERN ANALYSIS, DESIGN AND OPERATION OF ONLINE INTERACTIVE INFORMATION SYSTEMS. ESTABLISHMENT AND PRESENTATION OF EXISTING E-BUSINESS MODELS, KNOWLEDGE OF INTEGRATED E-BUSINESS APPLICATIONS, SUCH AS ERP, CRM, SCM AND E-PROCUREMENT.

2. OBJECT-ORIENTED SOFTWARE DESIGN

HOURS: 42 OUT OF WHICH 28/COURSE AND 14/LAB

CREDITS FOR GRADUATING: 6

EVALUATION PROCEDURE: EXAM

DISCIPLINE OBJECTIVES:

ENSURES STUDENT PREPARATION IN THE FIELD OF ANALYSIS-DESIGN-DEVELOPMENT AND IMPLEMENTATION OF COMPLEX SOFTWARE PRODUCTS; ACQUISITION OF MODERN METHODS AND INSTRUMENTS LIKE OMT, UML, CASE ETC., WHICH ENSURES THE INCREASE OF EFFICIENCY, RELIABILITY AND SECURITY IN THE SOFTWARE INDUSTRY. TRAINING SKILLS FOR DESIGNING OBJECT-ORIENTED SOFTWARE PRODUCTS.

3. QUANTITATIVE METHODS FOR MANAGEMENT

HOURS: 42 OUT OF WHICH 28/COURSE AND 14/LAB

CREDITS FOR GRADUATING: 6

EVALUATION PROCEDURE: EXAM

DISCIPLINE OBJECTIVES:

ACQUISITION OF KNOWLEDGE NECESSARY FOR THE DESIGN AND IMPLEMENTATION OF CURRENT FINANCIAL-ACCOUNTING INFORMATION SYSTEMS, USING VARIOUS DESIGN METHODS. ACQUISITION OF KNOWLEDGE REGARDING: NEW SOFTWARE SOLUTIONS FOR CURRENT ISSUES, ESPECIALLY COMPLEX ONES ENCOUNTERED BY BUSINESS ENTITIES; CLIENT/SERVER APPLICATIONS; MODELS OF COMMUNICATION; TYPES OF SERVERS; CURRENT SOLUTIONS FOR DESIGNING COMPUTER APPLICATIONS.

4. RESEARCH METHODOLOGY AND ETHICS

HOURS: 42 OUT OF WHICH 14/COURSE AND 28/LAB

CREDITS FOR GRADUATING: 6

EVALUATION PROCEDURE: COLLOQUIUM

DISCIPLINE OBJECTIVES:

PROVISION OF SPECIALIZED KNOWLEDGE REGARDING THE METHODOLOGY AND ETHICS OF SCIENTIFIC RESEARCH IN THE ECONOMIC FIELD, DEVELOPMENT OF CREATIVE-INNOVATIVE CAPACITY IN THE FIELD OF ORGANIZATIONAL MANAGEMENT AND DEVELOPMENT OF COMMUNICATION AND COLLABORATION SKILLS.

ELECTIVE DISCIPLINE (D.A)

1. SOCIAL MEDIA AND COLLABORATIVE PLATFORMS

HOURS: 42 OUT OF WHICH 14/COURSE AND 28/LAB

CREDITS FOR GRADUATING: 6

EVALUATION PROCEDURE: EXAM

DISCIPLINE OBJECTIVES:

UNDERSTANDING THE MODE OF OPERATION AND THE UTILITY OF SOCIAL PLATFORMS AND NETWORKS WITHIN THE CURRENT WEB ENVIRONMENT. USE OF COLLABORATIVE PLATFORMS. DEVELOPMENT OF COMPONENTS FOR COLLABORATIVE PLATFORMS AND USE OF COMPONENTS MADE AVAILABLE BY SOCIAL NETWORK PLATFORMS.

2. E-COMMERCE

HOURS: 42 OUT OF WHICH 28/COURSE AND 14/LAB

CREDITS FOR GRADUATING: 6

EVALUATION PROCEDURE: EXAM

DISCIPLINE OBJECTIVES:

KNOWLEDGE SPECIFIC TO DISTRIBUTION AND LOGISTICS - STRATEGIC DIMENSIONS, RELATIONSHIPS DISTRIBUTOR-PRODUCER-CONSUMER, LOGISTICS MANAGEMENT SUPPORT SYSTEMS, LOGISTIC-MARKETING COOPERATION AND FIVE MAJOR AREAS OF INTERACTION, INTERNATIONAL LOGISTICS SPECIFICITY, ELECTRONIC COMMERCE AND SUPPLY CHAIN INFORMATION SYSTEMS.

YEAR II. SEMESTER 1 - 14 WEEKS

MANDATORY DISCIPLINES (D.O)

1. SOFTWARE QUALITY MANAGEMENT

HOURS: 42 OUT OF WHICH 28/COURSE AND 14/LAB

CREDITS FOR GRADUATING: 6

EVALUATION PROCEDURE: EXAM

DISCIPLINE OBJECTIVES:

ESTIMATING THE COMPLEXITY OF COMPUTER SYSTEMS. DEFINITION OF TYPES OF COMPUTER SYSTEMS AND TECHNOLOGIES OF DESIGN. DEFINITIONS OF DESIGN-DEVELOPMENT-IMPLEMENTATION METHODS AND TECHNIQUES FOR EVALUATION OF COMPUTER SYSTEMS.

3. SOFTWARE ENGINEERING

HOURS: 42 OUT OF WHICH 28/COURSE AND 14/LAB

CREDITS FOR GRADUATING: 6

EVALUATION PROCEDURE: EXAM

DISCIPLINE OBJECTIVES:

COMPLEX CONCEPTS AND APPLICATIONS OF SOFTWARE PROGRAMMING. DEVELOPMENT AND REFINING OF COMPUTER APPLICATIONS.

3. ARTIFICIAL INTELLIGENCE

HOURS: 42 OUT OF WHICH 28/COURSE AND 14/LAB

CREDITS FOR GRADUATING: 6

EVALUATION PROCEDURE: EXAM

DISCIPLINE OBJECTIVES:

ACQUISITION OF KNOWLEDGE NEEDED TO IDENTIFY, DEFINE, EXPLAIN, ANALYZE AND APPLY THE FUNDAMENTAL CONCEPTS OF ARTIFICIAL INTELLIGENCE.

4. WEB APPLICATIONS AND INTEGRATED TECHNOLOGIES

HOURS: 42 OUT OF WHICH 28/COURSE AND 14/LAB

CREDITS FOR GRADUATING: 6

EVALUATION PROCEDURE: EXAM

DISCIPLINE OBJECTIVES:

THE COURSE AIMS TO PROVIDE SOLID KNOWLEDGE IN THE FIELDS OF HTML5/CSS/JAVASCRIPT/SVG FOR DEVELOPMENT OF WEB BASED APPLICATIONS. ELEMENTS OF FUNDAMENTAL 3D MODELLING AND PRINTING.

ELECTIVE DISCIPLINE (D.A)

1. MOBILE DEVICES PROGRAMMING

HOURS: 42 OUT OF WHICH 28/COURSE AND 14/LAB

CREDITS FOR GRADUATING: 6

EVALUATION PROCEDURE: EXAM

DISCIPLINE OBJECTIVES:

FAMILIARIZE STUDENTS WITH THE BASIC CONCEPTS OF APPLICATION DEVELOPMENT FOR MOBILE DEVICES BY USING THE PROGRAMMING LANGUAGE C# ON WINDOWS. COURSE COVERS THE CHARACTERISTICS OF THE SOFTWARE FOR MOBILE DEVICES AND THE BEST PRACTICES FOR THEIR DEVELOPMENT.

2. DECISION SUPPORT SYSTEMS

HOURS: 42 OUT OF WHICH 28/COURSE AND 14/LAB

CREDITS FOR GRADUATING: 6

EVALUATION PROCEDURE: EXAM

3. BRAND MANAGEMENT

HOURS: 42 OUT OF WHICH 28/COURSE AND 14/LAB

CREDITS FOR GRADUATING: 6

EVALUATION PROCEDURE: EXAM

YEAR II. SEMESTER 2 - 11 WEEKS

MANDATORY DISCIPLINES (D.O)

1. PERSONAL DATA PROTECTION SYSTEMS

HOURS: 33 OUT OF WHICH 22/COURSE AND 11/LAB

CREDITS FOR GRADUATING: 6

EVALUATION PROCEDURE: EXAM

THE COURSE COVERS THEORETICAL AND PRACTICAL ELEMENTS REGARDING THE PROTECTION OF ELECTRONIC DATA, WITH DIRECT APPLICABILITY IN THE PROTECTION OF PERSONAL DATA. BOTH METHODOLOGICAL AND PRACTICAL ELEMENTS REGARDING THE SECURITY OF ELECTRONIC DATA ARE COVERED. CLASSIFICATIONS AND PARTICULARITIES OF PROFESSIONALS IN THE FIELD OF DATA PROTECTION.

2. SPECIALIZED INTERNSHIP

HOURS: 90 OUT OF WHICH 90/INTERNSHIP

CREDITS FOR GRADUATING: 3

EVALUATION PROCEDURE: COLLOQUIUM

DISCIPLINE OBJECTIVES:

FAMILIARIZATION OF STUDENTS WITH THE CONCEPTS, METHODS AND TECHNIQUES USED IN THE REAL BUSINESS ENVIRONMENT. STUDENTS' ACQUISITION OF APPLICABLE SCIENTIFIC RESEARCH SKILLS. ACQUISITION OF SKILLS TO CARRY OUT REAL RESEARCH THEMES/PROJECTS. ELABORATION OF PROJECTS WITHIN INSTITUTIONS IN THE ECONOMIC OR COMPUTER FIELD.

3. SPECIALIZED SCIENTIFIC RESEARCH

HOURS: 56 OUT OF WHICH 56/PROJECT PREPARATION

CREDITS FOR GRADUATING: 7

EVALUATION PROCEDURE: COLLOQUIUM

DISCIPLINE OBJECTIVES:

FAMILIARIZATION OF STUDENTS WITH THE CONCEPTS, METHODS AND TECHNIQUES USED IN SCIENTIFIC RESEARCH. STUDENTS' ACQUISITION OF FUNDAMENTAL AND APPLICATIVE SCIENTIFIC RESEARCH SKILLS. ACQUISITION OF SKILLS TO CARRY OUT RESEARCH PROJECTS. ELABORATION OF RESEARCH PROJECTS WITHIN INSTITUTIONS IN THE ECONOMIC OR COMPUTER SCIENCE FIELDS.

4. DISSERTATION PAPER PROJECT PREPARATION

HOURS: 60 OUT OF WHICH 60/PROJECT PREPARATION

CREDITS FOR GRADUATING: 8

EVALUATION PROCEDURE: COLLOQUIUM

DISCIPLINE OBJECTIVES:

STUDENTS' ACQUISITION OF FUNDAMENTAL AND APPLICATIVE SCIENTIFIC RESEARCH SKILLS. ELABORATION OF PROJECTS / RESEARCH TOPICS SUCH AS SCIENTIFIC ARTICLES. ACQUISITION OF THE METHODOLOGY OF ELABORATION AND WRITING OF THE DISSERTATION PAPER. TECHNICAL ASSISTANCE IN DEFINITIVING THE DISSERTATION WORK.

ELECTIVE DISCIPLINES (D.A)

1. IOT AND SMART TECHNOLOGIES

HOURS: 33 OUT OF WHICH 22/COURSE AND 11/LAB

CREDITS FOR GRADUATING: 6

EVALUATION PROCEDURE: EXAM

2. LEADERSHIP AND ORGANIZATIONAL CULTURE

HOURS: 33 OUT OF WHICH 22/COURSE AND 11/LAB

CREDITS FOR GRADUATING: 6

EVALUATION PROCEDURE: EXAM

3. STRATEGIES AND ENTREPRENEURIAL POLICIES

HOURS: 33 OUT OF WHICH 22/COURSE AND 11/LAB

CREDITS FOR GRADUATING: 6

EVALUATION PROCEDURE: EXAM