



UNIVERSITETI I EVROPËS JUGLINDORE
УНИВЕРЗИТЕТ НА ЈУГОИСТОЧНА ЕВРОПА
SOUTH EAST EUROPEAN UNIVERSITY

Study program **Business Informatics (2022-2023)**

Faculty	Contemporary Sciences and Technologies
Study Cycle	Second Cycle (Postgraduate)
ECTS	120
Code	N-MBI120C
Title	Master of Business Informatics
Accreditation archive number [120]	03-175/1
Decision for starting of the program	03-175\3
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Description of the program

Business Informatics (BI) is a widely known discipline in continental Europe. Even though it is similar to Information Systems, it focuses more on the technical issues, including Information Systems and structural approaches for modeling and analyzing of the business processes and problems. BI is particularly important in the field of economy and enterprise environment, which is characterized by strategic joining, outsourcing, physically distributed operating environments and global business partnerships. New strategies, techniques, tools and technologies for the development of an appropriate field such as BI will be the main objective of the program. Understanding both business and informatics is of huge importance to the work of all business professionals, including the executive managers who determine the strategic organization direction, the information professionals who design and deliver new information services; accountancy and finance managers who use information systems for managing the finances and business reports; and marketing and sale managers who use information systems to follow customer purchase and promote new products. Business Informatics is a study of the Information Technology in business context. Information has become the key business resource which leads to the creation of new careers for the individuals who understand how to operate with information. These “knowledgeable workers”- people who understand how to store, retrieve, analyze and inform information- currently have a promising and productive career which is imposed on them. This balance also reflects the relation between the theoretical and practical subject content acquired through lectures, instructions, seminars, sessions in computer laboratories and self- study. The course knowledge is acquired through different approach methods including exam sessions, in-class tests, tutorials, individual tasks, group work and presentations. Students are expected to demonstrate inventiveness and originality aspects. The instruction objective is to provide students with quality study experiences which will provide them with best possibilities to understand the course fields and realize their maximum potential.

Career

With the Master of Science in Business Informatics, the graduates will find employment in the fields of system development, software project management, ultimate users of IT support, programming, and as business system analysts, system analysts. For this reason, the individuals who have not only the ability to design technical, computer-based solutions, but also have the ability to notice the possibilities of IT from a business perspective, will be sought for employment by every organization. Students will be equipped with the following skills:

- To manage information function in middle-size and big organizations
- To analyze, plan and develop IT solutions which support the market needs.
- To plan the required business analysis and business risk estimates.
- To develop skillfulness, to contribute to the decision making, design and implementation of the changes in the business process.

Learning outcomes

Knowledge and understanding

- Knowledge and understanding of business and informatics fields (economy, management, marketing, finances and, respectively, programming, databases, computer and information systems, networking and data engineering) on a level that extends the basic acquaintance of fundamental knowledge through elementary research-oriented knowledge and ability to demonstrate expertise in the treatment of real-world problems in the area.
- Able to develop and apply original and creative ideas within the environment which requires knowledge in the interdisciplinary, overlapping and cross-linked areas of business and informatics and express specialist competences in the same way.

Applying knowledge and understanding

- Can originally, critically, independently and creatively apply, use, develop and solve problems in new and unfamiliar environments in a multidisciplinary context of a real business and organizational environment.
- Can plan, implement and evaluate independent research issues in the domain of business and implement and apply different methods and methodologies of software development in commercial businesses.
- Can use a variety of software development tools and program them using shell scripts and compiled programs in standalone or web environments.
- Can in an original, critical and creative way participate in the process of solving problems in new, unseen or unknown environments for software development.
- Is able to organize software systems in order to solve different social, economic and / or technological issues.
- Is able to participate in research projects as a basis for further academic development.
- Demonstrates expertise in addressing real problems in the area of software development and project management.
- Can develop and apply original and creative ideas.

Making judgement

- In an adequate way can gather, analyze and evaluate data using modern tools and systems for certain economic and/or information and organizational issues, usually from the perspective of management and marketing.
- Argue ideas and concepts qualitatively and quantitatively from the business and organizational character using and implementing knowledge of information systems, corporate databases, and other software tools.
- Has the ability to adequately assess the required deadlines, resources and risks in the planning, development, deployment and maintenance of software, using appropriate tools.
- Can be tested, assessed and appropriately decide on a variety of possible IT solutions in commercial perspective.

Communication skills

- Able to clearly and unambiguously communicate study outcomes and knowledge to specialist audiences from both business and informatics fields along with the ability to appropriate the style and form of expression to non-specialist audience.
- Have competency for critically independent and creatively argued research, to evaluate methodologies and develop critiques and where appropriate to propose and defend new hypotheses.
- Demonstrate ability for initiating, leading and taking responsibility for a work of individuals and groups where business and informatics competences are crucial for the type of the position.

Learning skills

- Able to identify personal needs and directions for individual and autonomous study and to perform it in self-directed and autonomous manner in the common business and informatics areas.
- Able to take responsibility for ongoing individual and group learning in specialized business and informatics fields within the networked economy, including defining learning objectives for medium and longer terms.

List of courses

Semester 1

- [C2117] [6.0 ECTS] **Fundamentals of Business Economics**
- [ECSIS-05] [6.0 ECTS] **Information Systems Management**
- [MCBI2022] [6.0 ECTS] **ICT Project Management**
- [EM556] [6.0 ECTS] **Fundamentals of Computer Science**
- [6.0 ECTS] **General elective course**
- [6.0 ECTS] **Professional elective course**

Semester 2

- [CM184] [6.0 ECTS] **IT Infrastructure**
- [CM183] [6.0 ECTS] **Enterprise Corporate and Systems**
- [CM180] [6.0 ECTS] **Data Science**
- [6.0 ECTS] **General elective course**
- [6.0 ECTS] **Professional elective course**

Semester 3

- [MCS-303] [6.0 ECTS] **Research Methodology**
- [MCBI-01] [6.0 ECTS] **Business Process Modeling**
- [CM181] [6.0 ECTS] **e-Business**
- [CM182] [6.0 ECTS] **Collecting, Aggregating & Managing Data**
- [6.0 ECTS] **Professional elective course**

Semester 4

- [MCBI4010] [30.0 ECTS] **Master Thesis**

Description of courses

Core courses

• **Fundamentals of Business Economics**

The aim of the subject is to introduce students with the core economic and business principles and how these can help decision makers in a business environment to come with sound behavior and decisions. The course provides the fundamental basics and concepts of microeconomics that explain how economic agents make decisions and how these decisions are deployed. It explains how macroeconomics principles and the economic system works in a country. It will also provide skills how to analyze decisions taken by economic agents and how those decision affect the economic system. Thus, the course illustrates the way in which economists view the world. At the end of the course students should be able to "think like economists". This course provides research on the principles of micro and macroeconomics, with a focus on the application of knowledge in decision-making in a global setting.

• **Information Systems Management**

The aim of this program is to give an overview of information systems from organizational and social perspective. The objective is to supply the students with the adequate balance of technical and organizational perspectives that will serve as a foundation for further studies in the field of information systems.

• **ICT Project Management**

The course introduces the area of ICT project management, presenting techniques and approaches and aiming to develop a critical awareness of the challenges and shortcomings of the area. The module builds on knowledge of Software Engineering and in other Information systems courses.

• **Fundamentals of Computer Science**

Course aims: To enable students to acquire basic knowledge and skills in the field of computer science. To enable students to acquire theoretical and practical knowledge in the field of computer science, and to apply them in real life. To enable students to work on projects, individual or group, which by nature can be scientific - research projects,

development projects or practical work.

- **IT Infrastructure**

This course introduces and explores the necessary terminology for IT infrastructure, organization, processes, design, implementation and management. Topics will include telecommunications fundamentals, server architecture, as well as cluster and grid computing. The course also deals with techniques for the development of an integrated technical architecture (hardware, software, networks and data) in order to serve organizational needs, create the necessary technological environment for companies that will allow them to quickly adapt and change business processes.

- **Enterprise Corporate and Systems**

Covers foundational aspects of both enterprise and architectural thinking, including the software to technology to solution architecture continuum, role of EA in business and IT alignment, architectural styles and techniques for capturing and documenting architectures. Techniques for analyzing and reasoning about architectures are practiced in assignments in class.

- **Data Science**

Data science is an emerging interdisciplinary field stemming from statistics, mathematics and computer science. Data science involves using methods to analyze massive amounts of data and to extract knowledge from them. The objective of this course is to provide students with a principle of data science. Students will learn the fundamental pipeline of data science, ranging from data acquisition, data clean-up, data exploration and visualization, modeling and inference, to professional reporting. The course also will help students how to use tools for acquiring, cleaning, analyzing, exploring, and visualizing data; making data-driven inferences and decisions; and effectively interpreting and communicating results.

- **Research Methodology**

The purpose of this course is to provide students with knowledge and understanding of different scientific theories and methodologies. Initially the student will be introduced to the conceptual, theoretical definitions and examples of all existing methods of research, hypothesis, direct and indirect variables, validation of the results, the conclusions BIAS and scientific qualitative and quantitative methodologies, "ground research" methodology and other methodological approaches. In each chapter the student will work on practical assignments. After completing the course the student will be able to explain thoroughly and understand the importance of basic scientific concepts, effectively search and find information-relevant literature, identify, describe and formulate scientific problems, make a careful choice of alternative research approaches, thoroughly described, compare and explain the advantages and disadvantages of different scientific methods for collecting quantitative and qualitative data, apply basic scientific methods to analyze quantitative and qualitative data, understand different frameworks for building theory and review and evaluate scientific publications.

- **Business Process Modeling**

Aims of the course program: Processes are the core technologies of all organizations for producing and delivering products and services that satisfy customer needs. Increasingly, in order to continue to serve their customers and remain competitive, organizations are required to continuously analyze, redesign, and improve their end-to-end core business processes in shorter and shorter time frames to achieve operational goals. Realizing this end-to-end business process integration requires an IT infrastructure that enables people, processes, and information to be integrated in a flexible manner. This course will explore how organizations can model business processes as the first step in achieving flexible and integrated business processes. The course will also examine the information technologies and architectures that show promise for enabling this business process integration. The course will provide students with the following: - A framework for understanding the design, control and improvement of business processes. Much of this material will be drawn from the field of operations management. - A methodology for analyzing, modeling, and designing business processes, including the use of simulation for measuring and comparing performance of various models. - Knowledge of the current and emerging information technologies and architectures as enablers of business process improvement, integration and automation.

- **e-Business**

Course aims: The digital business enterprise, the creation of new business designs reached by blurring the digital and physical worlds, revolves around technologies that make information useable and mobile. This subject focuses on the digital ecosystem, the interplay between the physical and digital worlds, to explore the digital trends and innovations for businesses. Industry reports and discussion focus on deriving value from digital platforms to address business strategies. Topics include enterprise modeling frameworks, use of digital technology industry reports in

business value creation, enterprise system platforms and interfaces.

- **Collecting, Aggregating & Managing Data**

Course aims: The ever day increasing of the amount of data available as part of daily activities in business, science, education, entertainment, etc., has become an everyday concern and vocabulary. In addition, the need to work with large volumes of data, current applications are also challenged with multi-modal data, including unstructured and semi-structured data, image and video data, spatial and temporal data, and so on. All those data need to be managed. The need to collect, arrange, aggregate and generally management is a concern on a daily basis. This subject covers a part of data life cycle, including data collection, aggregation and managing. As most of data are stored in databases, also will be examined various database engineering approaches to support data management, including collection, aggregation, and maintenance. Data standards, quality store of data and the challenge of "big datasets" also will be considered. The next goal of the subject is the variety of data storage systems and technics.

- **Master Thesis**

This module enables students to transfer their skills and knowledge to research and carry out more complex tasks related to their master thesis. The module is designed to be fully practical and students to acquire the necessary knowledge and skills to approach writing the thesis. The module has unique return result-to enable students to write the master thesis with minimal difficulties, and with maximum efficiency. The course aims to improve research techniques and style of writing the paper, taking into account the prevention of the usage of illegal means, such as plagiarism and infringement of copyright, which are prohibited by the Statute of SEEU.

Elective courses

- **Impacts of Digitization**

The course provides a general understanding of how accessible digital content intervenes in key processes in business. We will cover how businesses can utilize the available digital content as a resource to promote profitability and competitive advantage, and how an increased degree of sharing culture and big data affects strategic thinking, corporate communications, marketing and innovation.

- **Advanced Systems Development**

Course aims: Upon successful completion of the course, the student should be able to: 1. Demonstrate advanced knowledge of high-level block-structured programming languages. 2. Demonstrate advanced knowledge of structured problem-solving methodologies. 3. Analyze and structure large-scale programs and systems. 4. Develop algorithms in response to system-level problem scenarios. 5. Develop well-organized, block-structured, easily read programs. 6. Demonstrate advanced knowledge of linear data structures (arrays, records, files) and abstractions in programs to manage and manipulate data, and to solve problems in business environments. 7. Demonstrate advanced ability to declare and use variables, perform mathematical operations, and use comparisons in programs. 8. Demonstrate use of functions and procedures, arithmetic expressions, selection structures, and repetition structures within programs. 9. Demonstrate ability to use program verification and complexity analysis in programs. 10. Demonstrate utilization of string manipulation, sorting and searching techniques in programs. 11. Develop complex interactive programs for comprehensive file updating with sequential and random-access files. 12. Demonstrate advanced knowledge, use, and manipulation of arrays to organize and sort data. 13. Develop large-scale programs and systems utilizing program-linkage and sub-programming. 14. Demonstrate ability to develop large-scale programming applications to manipulate databases (including query, display, edit, update functions). 15. Demonstrate ability to design complex user interfaces (including graphical user interfaces and integrated multiform programs) utilizing appropriate design concepts. 16. Develop large-scale programs and systems as a member of a development team. 17. Develop appropriate testing procedures and documentation for programs. 18. Demonstrate intermediate to advanced knowledge of high-level procedural and object-oriented programming languages and systems development.

- **Innovation Management**

Innovation management represents a set of approaches through which creativity and innovation are encouraged through various techniques and approaches. This subject will analyze the latest topics in the world literature related to innovation, creativity and their management process in various fields. In addition to theoretical analysis, this subject will enable practical access to students through creating real innovation and going through all the stages of learning methods of creating new ideas, as well as applying for funding and pitching.

- **Emerging Technologies and Issues**

This course explores the current and potential future impacts of new, emerging, and rapidly evolving technologies on organizations and their operations across a range of industries and sectors. Students will gain insights into these technologies and how these organizations are coping (or not) with the resulting disruption. In addition to tools and best practices, students examine the challenges and opportunities in designing projects that implement new and emerging technologies. Other topics include managing change in organizations as a result of disruption, the benefits and challenges of adapting new technologies, and legal and privacy issues. A case study project throughout the course investigates how to identify and implement a new technology that will solve a problem in an organization.

- **Software Testing and Analysis**

Software plays an important role in our daily activities, often providing critical services to end users. It is important to ensure that these systems function as they are intended with a high degree of quality. Software testing and program analysis are two techniques that are widely used to ensure the software quality. These techniques are used by developers in order to validate, verify, and evaluate the quality of software produced during the software engineering process. This course aims to provide students with advanced knowledge of the techniques used in software testing and program analysis. Students will gain an understanding of the concepts and theories that underlie these techniques. Students will also learn to use existing popular tools that support testing and analysis tasks and will be exposed to new research in the area.

- **Software Quality Assurance and Risk Management**

As software becomes more complex, and in order to ensure a higher quality, it is necessary to establish clear processes and methodologies. Doing so will ensure that the end-product has been exposed to intensive and rigorous industry-wide verification and validation techniques and procedures. Additionally, it is necessary to provide good management of risks in order to ensure reliable processes. This will translate into a high degree of assurance that a software system passes the test for correctness and reliability. The aim of this course is to provide theoretical and practical knowledge about both the quality assurance processes and risk management.

- **e-Accounting**

The course aims to analyze the prism of accounting of information systems. The course also analyzes accounting from a business perspective and system perspective. After completing this course, students will be able to understand the internal processes in accounting, as these processes are related, what effect has each process in other processes, accounts and annual reports. This knowledge students can use in their careers as business analysts.

- **Service Oriented Architectures**

The aim of this course is to establish an in-depth study of Service Oriented Architectures (SOA) from three main perspectives: business, architectural and technological point of view. From business perspective, adopting SOA is essential to delivering business agility; therefore, the importance of SOA in industry will be explained. The architectural perspective will discuss different architectural models of software development, with focus on SOA design and design patterns. The technology perspective will provide students with the opportunity to gain the required experience to implement and deploy SOA solutions that will meet different functional and non – functional requirements.

- **E-Commerce**

Commercial transactions in an electronic era, understanding of technology, transactions, marketing and trade, business, management and technical implementations of E-commerce. Students will first acquire leadership, planning and team management skills included in the initiation and development of highly technological endeavors.

- **Web and Mobile Application Development**

This course aims to provide students with knowledge of the technologies used to build web and mobile applications. In addition to general aspects of specific technologies on different platforms, the focus will be on software development that can run on multiple platforms simultaneously, technologies that are typically based around the JavaScript programming language. In addition to the techniques for developing, publishing and maintaining this type of software, the course will cover the benefits and limitations or difficulties we encounter in developing such software.

- **Data Visualization**

The aim of this course is to introduce students to the field of data visualization. Students will learn visualization design and evaluation principles, and learn how to acquire, parse, and analyze large datasets. Students will also learn techniques for visualizing multivariate, temporal, text-based, geospatial, hierarchical, and network/graph-based data. Additionally, students will utilize Processing, D3, R and ggplot2, and many other tools to prototype many of these techniques on existing datasets.

- **Digital Economy**

The course provides students with a set of knowledge that digitalization plays in developing the national economic systems, as well as the digitalization of economic management processes. The course equips students with necessary skills for analyzing electronic markets and certain aspects of the activities of organizations in the e-business industry. In addition, the course provides students with knowledge, skills and competencies needed to use digitization for an economy development, and to manage the digital transformation of an organization's business.

- **Business Intelligence and Analytics**

The aim of this course is to provide the student with an understanding of several management science techniques and to provide some insight into how these tools may be used to analyze complex business problems and arrive at a rational solution. The techniques to be studied are forecasting, linear planning, simulation, and modeling. Cases of increasing complexity will be used to emphasize problem description, definition, and formulation. The computer will be used extensively throughout the course, primarily by using available programs to perform the calculations after the problem has been correctly formulated. Emphasis will be placed on the interpretation and implementation of results. In addition, we will examine the future of analytics.

- **Systems Analysis and Design**

The aim of this course is to enable students to understand and use the methodologies, techniques, tools and perspectives essential for systems analysts to successfully investigate and develop information systems requirements, as well as deliver solutions tailored to its requirements using standard modeling techniques such as structured modeling techniques, information engineering modeling techniques, and object modeling techniques. Moreover, understand the methods and constraints involved in creating a workable design from the results of using the above systems analytics.

- **Software Project Management**

The aim of this course is to give students knowledge on how to develop a software project management plan for software intensive systems; how to set up monitoring and control mechanisms; how to allocate and reallocate project resources; how to track schedule, budget, quality, productivity, and progress; frameworks and how to plan for the installation and support phase of the system life cycle. They will understand the importance project structure, resource planning and execution, and progress measures of a project. In addition, they will understand the relationships among quality assurance, configuration management, verification and validation, and test and evaluation. They will also gain an understanding of the key issues in costing and pricing units of effort, motivation of workers, leading project teams, and total quality management.

- **Data Warehouses**

This course provides the student within depth knowledge of Data Warehouse principles, Data Warehouse techniques, and Business Intelligence systems. The course introduces the topics of Data Warehouse design, Extract-Transform-Load (ETL), Data Cubes, and Data Marts. Topics covered include the logical design of a data warehouse, the data staging area and extract-transform-load processing, the use of multi-dimensional analysis using OLAP techniques, and other techniques. Also, the course will explore how to support decision making and extraction of predictive analytics and patterns. Students will create Business Intelligence using Data Warehouses with several OLAP and analytical tools.

- **Cloud Computing Technologies**

This course covers a series of current cloud computing technologies. The students will learn how to develop Cloud-based software applications on top of various Cloud platforms, how to integrate application-level services built on heterogeneous Cloud platforms, and how to leverage SaaS and PaaS solutions to build comprehensive end-to-end business solutions on the Cloud. For different layers of the cloud technologies, practical solutions such as Google, Amazon, Microsoft, Salesforce.com, etc. as well as theoretical solutions (covered by a set of papers) will be introduced.

- **Large Systems (ERP, CRM)**

The development of ERP-systems over the last decades has been one of the key advancements in organizations' use of information technology. The aim of this course is to introduce students to Enterprise Resource Planning (ERP) software systems and their role within an organization. It introduces key concepts of integrated information systems and explains why such systems are valuable to businesses. The course will also provide a discussion on various business cases in which ERP concepts can be applied.

- **Requirements Engineering**

The course covers concepts for systematically establishing, defining and managing software requirements for large,

complex, changing and software-intensive systems. The process is covered from technical, organizational and management perspectives, discussing past, present and future paradigms and methodologies in requirements engineering. The course covers informal, semi-formal and formal approaches, while keeping the balance between theory and practice. It involves building models of both requirement engineering process and requirements engineering product, concerning both functional and non-functional goals/requirements/specifications, using a systematic decision-making process.

- **Fundamentals of Business Administration**

This course is an introduction to the many facets of the private enterprise system and of the businesses that operate within its framework. This course enables students to better understand of what business arena is all about, how a business operates, and which business functions are needed in any business enterprise. In addition, the course provides information about the forces within the business environment as well as an introduction to the key functional areas within the firm, such as marketing, operations, accounting, finance, management, and human resources, etc.