



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

## Study program **Application of Information and Communication Technologies (ICT) in Teaching (2019/2020)**

Faculty	Contemporary Sciences and Technologies
Study Cycle	Second Cycle (Postgraduate)
ECTS	60
Code	N-MCSTAICTT60C
Title	Master in Informatics / Module: Application of Information and Communication Technologies (ICT) in Teaching
Accreditation archive number [60]	03-26/2
Decision for starting of the program	03-26/4 (23.08.2019)
Accreditation date	23.04.2019

## Description of the program

Application of Information and Communication Technologies (ICT) in Teaching - 60 ECTS represents a cohesive study program aiming at improving the knowledge, skills and professional development of teachers and others in the state of the art approaches in obtaining new knowledge. These master studies are focused in effective use of technology in education and teaching. During these studies students will gain knowledge in how to design programs based on technology, using information technologies in preparation of lectures and lecturing, using and developing new platforms of learning. Creation of digital education content, e-learning, education software, multimedia projects in teaching. It ensures professional development of teachers and other interested in educational studies. The studies are based on the state of the art research and practices in e-learning and improving teaching through ICT. It develops practical skills and analytical understanding of ICT and eLearning and its role in professional practice.

## Career

Students who will finish this master will be able to:

- implement the ICT in the process of teaching and evaluation - control;
- design modern courses;
- design courses for students with special needs;
- monitor and understand of trends in ICT development and its application in modern teaching.

## Learning outcomes

### Knowledge and understanding

- Ability to develop and apply original and creative IT ideas with the purpose of securing quality in education
- Ability to apply IT skills and knowledge and demonstration of special competencies of computer science and informatics

with the purpose of organizing interactive teaching in education

- Knowledge and understanding from the fields of computer science, engineering and informatics (programming, web technologies, databases, basic networking, computer and information systems and multimedia).
- Knowledge of one or more subject fields which can qualify the student as an expert in applying knowledge in a given field.

### **Applying knowledge and understanding**

- Ability to critically, independently and creatively solve problems in new fields or environments for which there has not been much experience in education. Planning, leading and evaluating independent research in the domain of education but also creation and implementation of appropriate interactive multimedia materials, learning tools and online testing through games;
- Creativity and originality in interpreting the knowledge from informatics through solving problems connected to goals and materials from the field they teach.

### **Making judgement**

- Ability for a creative integration and synthesis of knowledge from many fields in education, as well as administration of the educational process and evaluation of students with the help of IT tools designed for a particular problem. Creation of educative processes with the help of computer tools and techniques;
- Ability to deal with complex situations connected to specific educative processes introduced in real time in education;
- Ability to identify appropriate instances in education and to appropriately assess in situations lacking complete information or data based on personal, social and ethical principles and responsibilities connected to the application of knowledge and understanding.

### **Communication skills**

- Ability to exchange conclusions and proposals with argumentation and rational arguing of the same, both with experts as well as with people without expertise, clearly and unambiguously;
- Undertaking considerable responsibility for joint results;
- Leading and initiating activities.

### **Learning skills**

- Ability to identify personal needs and directions for individual and autonomous further personal education and its independent and autonomous application in the general fields of informatics;
- Ability to undertake personal responsibility for personal continuous education in the specialized business in the field of informatics and networked economy;
- Ability to undertake responsibility for further professional development and sophistication.

## **List of courses**

### **Semester 1**

- [MICTT-105] [6.0 ECTS] **E-Learning Design: Learning, Instructions and Assessment**
- [MICTT-106] [6.0 ECTS] **Data Analysis**
- [MAICTT-103] [6.0 ECTS] **Research Methodology**
- [6.0 ECTS] **Elective course**
- [6.0 ECTS] **Elective course**

### **Semester 2**

- [MAICTT-400] [30.0 ECTS] **Master Thesis**

## **Description of courses**

### **Core courses**

- **E-Learning Design: Learning, Instructions and Assessment**  
The course covers the methodology, skills, and techniques necessary for developing effective eLearning solutions. This course provides the foundation for instructional development. The main aims include: -Exploring current

theories, principles, methodologies, and techniques of online learning -Creating interactive eLearning solutions that meet learners' needs -Building strong knowledge and skills to design eLearning interactions that increase learning effectiveness.

- **Data Analysis**

Aims of the course program: • Understanding on data collection and, data preprocessing; • Use of probability and statistic in data analysis; • Distinguish between descriptive and inferential statistical analysis; • Produce effective data visualizations for acquired and prepared data; • Performing data analysis by using of R; • Deduce results from statistical analysis and provide greater insights about data; • Assess the output of various statistical tests.

- **Research Methodology**

This course provides a comprehensive introduction to research methodologies, the basic research theories and protocols, and writing research proposals. Students in this course will learn about the cyclical nature of applied research and the iterative process of research writing. The course teaches students how to identify the subject of study, formulate questions, organize a literature review, and select appropriate research projects and methodologies. By the end of the course, students will complete a proposal that includes an introduction, a statement of the problem (the meaning of the study), literature review, methodology section, references, and schedule of the project.

- **Master Thesis**

This module enables students to transfer their skills and knowledge to research and make more complex task of the 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 paper, taking into account stopping illegal means, such as plagiarism and infringement of copyright, which are prohibited by the Statute of SEEU.

## Elective courses

- **Computer Systems**

Upon completing this course, students should: - Understand the basics of computer systems and their organization; - Know how to integrate various numeric systems; - Understand Boolean algebra and its application; - Understand the principles of computer architecture; - Differentiate between different operating systems and their application; - Understand the basics of computer networks.

- **Introduction to Database Systems**

- Presentation of conceptual model and model based on entities and relationship, conceptual modeling, E-R diagram; - Presentation of relational model, relational databases; - Introduction to SQL language; - Normalization of the database schema; - Introduction to database management systems, tools for defining, using and maintaining the database, tools for forms and for creating reports.

- **Multimedia in Education**

Goals of the study programme: - To enable students to acquire basic knowledge and skills in the multimedia area; - To enable students to acquire theoretical and practical knowledge in the field of multimedia, and to implement the same techniques and methodologies in their classes; - To enable students to broaden and deepen the general knowledge of multimedia concepts (text, image, audio and video) and use them in designing the learning process; - To enable students to work on projects, individually or in groups, who by nature, may be scientific - research projects development projects or internship.

- **Software for Educational Purposes**

Objectives of the curriculum: - The definition of educational software, the importance of using various software in the educational process, its usage, evaluation of the benefits of the use of educational software; - Presentation of various educational software, both free and commercial; - Use of educational software for learning a subject (e.g., subjects of science, language, etc.) - Principles for design and engineering of educational software.

- **Introduction to Technologies in Education**

Goals of the study programme: - To demonstrate knowledge, skills and concepts connected to technology and computers - To use current and new technologies in improving and integrating education for instruction, knowledge and learning; - To identify and evaluate / review the suitability of computer software in education as well as the

suitability and adaptability of students with special needs; - To identify and use suitable / appropriate internet sites and resources to improve the education and learning; - To demonstrate the usage of computers for developing teaching material and using children software to support and improve the learning for students of all ages; - To select suitable technological tools in learning, teaching, grading and evaluation; - To develop activities through development domains which incorporate the usage of technology and to secure adaptation for all students.

- **Professional Ethics of Information Technologies**

The course provides an introduction to ethical and moral values in general, and use of information Technologies, in particular. Also the course is an introduction to the design and implementation of IT professional codes of ethics in public and private institutions. It analyzes and discusses ethical dilemmas in professional use of information technologies. Through concrete examples it covers all areas of study related to ethics when using information technologies.

- **Assistive Technologies for Students with Disabilities**

The aim of the course is to help students learn the technology for easing the education of children with special needs. This course covers information about the use of technology for many types of handicap, such as blindness, deafness, students with motor obstacles, etc. The course covers a broad overview of the use of contemporary technology and online resources which could be used to help students in their everyday tasks envisioned with the teaching plan.

- **Design and Evaluation of Learning Web-Based Environments**

This course aims to encourage students who want to learn the basic theories of design of learning and teaching as a basis in evaluation and development of web-based systems or learning applications. Through lectures and discussions, students will have the ability to use and analyze various conventional and mobile web-based applications and technologies aimed for online interaction and collaboration. Students will also discuss, share and apply design strategies to support development of online environments which will enable and ease the interactive learning. To complete the course, students will form groups and work in teams in developing small web-based learning systems as part of their final project.

- **Data Processing in Education**

Goals of the study programme: - Getting to know the concepts of data and information, types of information, relevant data in education, classification of data ; - Methods of data processing, mathematical and statistical data processing; - Getting to know and apply the techniques of data mining; - Visualization and presentation of data; - Knowledge of computer tools (software packages) for data processing;

- **Learning Management Systems**

The course is aimed to introduce the Learning Management Systems (LMS) as the key tools that sustain the new educational approaches. Although these systems usually have their own specifics, yet from a broader point of view they do offer some similar functionality. These functionalities will be introduced and analyzed too. The aim of the course is also to build a broader overview on the LMS trends and needs. The course will cover also analysis of the LMS implementation in several HE institutions. The practical part of the course includes creation of a course using the LMS authoring tools and conducting an online module using built-in technologies.

- **Digital Content Creation**

The objective of this course is to explore the design, development, and integration of digital media to enhance the learning experience and to investigate how emerging digital media and tools impact technology-mediated learning environments.

- **Gamification of Learning**

The aim of this course is to address significant topics to utilization of gamification in educational settings. Students will learn what gamification is and how to implement gamification in the classroom. The course will provide an overview of gamification or game thinking onto the instructional design courses. It will outline a layered blueprint for instructional design that caters to the intrinsic motivation elements of gamification, in particular the elements of flow and self determination theory.

- **Social Media in Education**

- Describing and implementing new paradigms for communication, learning, and education. - Introducing students to various social media platforms as well as using them for their academic and professional development. - Establishing a positive digital footprint and gaining experience with Personal Learning Networks (PLNs).

- **Applications for Statistical Data Processing**

The aim of this subject is: - To display the technical elements in the field of statistics: organizing, processing, comparing through analysis and publication of data. - To enable students to acquire advanced knowledge and skills from selected advanced chapters of the applications for statistical data processing. - Practical application of these objectives in statistical processing of data obtained from questionnaires, reports, scientific studies and other documents.

- **Scientific Papers Writing Tools**

This course is designed to give graduate students the skills necessary to write scientific papers and master thesis, and to prepare other research works for presentation or publication.

- **Rhetoric**

During its long history of 2,500 years, rhetoric was used to indicate many different things; but rhetoric nowadays is considered as the art of persuasion through language. Rhetoric marks the way that an individual is linked to a particular theme or idea in order to convince the others. Rhetoric is characterized by several distinguishing features.

- **Multilingualism and Multiculturalism**

The purpose of this subject will be multilingualism in multicultural societies as a social phenomenon. This phenomenon is massive in the world. During the lectures, more precise terms such as monoculturalism and multiculturalism will be considered. The term 'linguistic nationalism' has at least two forms of this nationalism, which collide with each other: for the leaders of the most powerful countries nationalism means expansion, and for minorities it takes the form of defiance and struggle for the affirmation of identity, despite such pressure. The emphasis during the program will be multiculturalism in education. In the schools curricula consists of contents from different cultures.

- **Professional Communication**

The course is focused on the development of those communication skills that are essential for effective functioning in the professional world. Students will study the process for analysis of different communication situations, and will accordingly comprehend them. Among the themes that will be covered are communication in organization, interpersonal and group communication, oral presentations, interviews for employment, professional business letters and interpersonal skills including group dynamics and teamwork.

- **Project Management**

On successful completion of the course, students will be able to: - plan the activities necessary to implement the project, identify their interdependencies, their duration and costs; - prepare the necessary reports and perform all the required communication between the project and the client, as well as among the team members and the other stakeholders. - structure the project to its constituent activities; - prepare a Gantt-chart and a network plan for the project and identify the shortest time needed to complete the project; - use MS Project as a tool in the process of planning, implementation and review of the project; - define the project, identify its scope and objectives and develop project specification;

- **Optimization Methods**

The aim of this course is to present techniques of modeling and optimization in order to prepare students for developing their ability to prepare models for solving real problems in the field of computer science. The course explore the importance of matrix factorizations as an important tool which offers modality for optimizing the solutions of different numerical algorithms which are of basic interest for problem solving in the area computer sciences. The course introduces optimization theory and approach to find the optimum. The different methods of optimization will be analyzed such as the simplex method, duality problem and sensitivity of the problems of linear programming. The aim is to explore a computer implementation for each of the problems followed by the proposal of the corresponding model for optimization.

- **Ethical and Legal Issues in Information Technology (IT)**

Aims of the course program: - to develop an understanding of the relationship between computing, technological change, society and the law; - to emphasize the powerful role that computers and computer professionals play in a technological society; - to provide an understanding of legal areas which are relevant to the discipline of computing; - to provide an understanding of ethical concepts that are important to computer users and professionals; - to provide experience in the consideration of ethical matters and the resolution of ethical dilemmas.

- **Protection of Human Rights**

The purpose of this course is: to introduce students with the concept of international law on human rights, their implementation, influence of those rights in the creation of national policies; to encourage students to critically reflect

on the relationship between international law and national law; make them aware of current international events, how they affect the daily lives of people in the world; encourage students to contribute in matters of drafting laws for the protection of human rights hoping that, the law makers will consult them same during the creation and implementation of state policies.

- **IT Applications for Preparing a Scientific Paper**

The aim of this subject is: - To display the technical elements, the structure of the text and design of a scientific research. - To enable students to acquire advanced knowledge and skills from selected advanced chapters of IT applications that will be needed in preparing the scientific and research paper. - Practical application of these objectives in preparing student's individual research paper.