STUDY PROGRAM

"INFORMATION TECHNOLOGY"

HIGHER EDUCATION INSTITUTION "INTERNATIONAL BUSINESS AND INFORMATION ACADEMY TUZLA"

Bosna i Hercegovina

Tuzla, 2023.

CONTENT

INTRODUCTION

We live in the age of information and technology, where the development of technologies, information and process management are interdependent and the sustainability of almost all segments of the development of society, especially the economy, is based on them. In the contemporary economy and modern society, information and communication technologies (ICT) are the key carriers of innovative and development processes in the majority of industrial branches and social communities. In the past years, ICTs have spread in such a way that they have forced governments to establish more efficient public services for their citizens, the business sector to adopt new forms of business and communication with business partners, the population to use the Internet in order to implement business and everyday activities. Global communications, electronic business and the Internet bring more and more benefits, wealth, development and democracy to the developed world.

The actions, which are proposed and demanded, within the efforts for BiH to become an information society, are aimed at educational institutions to implement programs for the development and application of computing, information technology, information systems management, electronically supported learning, electronic business, e-administration and e-government, e-health, etc. All of the above should result in the creation of highly specialized IT, business and communication experts with a wide range of knowledge related to the processing of information and knowledge.

At a time when Information Technology are becoming more and more present in all aspects of business, students in the study program "Information Technology" will be able to participate in the transformation and preparation of organizations for business in the conditions of the "digital economy" through the acquisition of basic knowledge in the field of computer science, Information Technology and business processes.

The strategic commitment of BiH is that the functioning and development of ICT is based on a high world level, which is necessary for the inclusion of BiH in the international division of labor and international integration. Within the Policy for the Development of the Information Society in BiH (Council of Ministers of BiH and UNDP, 2004), the planned goals for the development of the information society are, among others:

- increasing the knowledge and ability of citizens to work and live in the information society,
- creating a new market environment, new business processes, knowledge and adequate ways of organizing and
- development of the ICT industry (software, engineering, hardware, consulting).

The objectives of the "Information Technology" study program at the Higher Educational Institution "International Business and Information Academy Tuzla" (hereinafter: IPI Academy) are completely in accordance to the implementation of the development strategy of BiH and the policy of development of the information society in BiH, especially in the field of ICT industry, e-business, e-education, e-health, e-administration, ICT in education, etc.

The importance of the "Information Technology" study program can be obtained from the fact that the introduction of electronic business in recent years has led to a quantum jump in the company's

competitiveness. Upon completing this study program students will be equipped with the required knowledge and skills to work in private and public sector organizations in the field of introduction, maintenance and application of information technologies in business processes. Graduates of the study program "Information Technology" will know about information systems, databases, programming in different environments, as well as concepts of business processes, and methods of information support for those processes. A rich selection of content from economics and other social disciplines provides graduates with a broad view of events in contemporary society and the inclusion of information technologies in social and business frameworks. Based on the broad interdisciplinary knowledge they acquire in this study program, graduates can easily and simply engage in the creative work process in various organizations.

According to the Recommendations on criteria for licensing higher education institutions and study programs in Bosnia and Herzegovina, this study program is compatible with the following study programs:

1. Study program Electronic business at the College of Vocational Studies for IT Belgrade,
2. Study program Information and business systems at the Faculty of Organization and Informatics Varaždin,
3. Study program Computer Science and Internet Technologies at the Faculty of Information Studies, Novo Mesto,
4. Study program Information systems and technologies at the Faculty of Organizational Sciences in Belgrade,
5. Study program Software engineering at the Faculty of Technical Sciences in Novi Sad.

It is important to emphasize that this study program enables the continuation of studies for students who are already attending the Information Technology study program at the IPI Academy at the three-year level and that in this way no pressure will be exerted on the market of educational institutions of higher education.

1. COMPLIANCE OF THE STUDY PROGRAM OF INFORMATION TECHNOLOGY WITH THE NEEDS OF THE LABOR MARKET

Existing higher education institutions adapt their enrollment policy to their existing resources, while the labor market, which is characterized by high unemployment, suffers from a deficit of certain personnel profiles. This first of all refers to the staff of the IT profile, because according to the data on the records of the Employment Office of TK, all the staff of the IT profile have been employed in the past years. During the past years, there have been periods in the records of the TK Employment Office when the mentioned personnel were not at all among those actively looking for employment.

In addition, when analyzing the number of students in secondary schools of Tuzla Canton who have completed their education in the past years, it can be seen that professions of the IT profile (electrical technician of computer engineering and automation, electrical technician of electronics, technician of mechatronics, ICT technician, computer technician, mechanical technician for computer design, technician operator for CNC machines, mechanical technician for power engineering, etc.) make up about a fifth of all professions of the fourth degree. In 2015, in the area of Tuzla Canton, about 600 students acquired the title of technician according to the above listed professions. There are also other schools that educate high school students with an IT orientation (e.g. General Education Grammar School "Meša Selimović" and others). On the

other hand, the number of students enrolled in existing higher education institutions in the Tuzla Canton that offer education for computer and IT professions is up to 300, so the possibility of absorption of high school students of these higher education institutions is relatively low.

Furthermore, by taking into account research in the region and Europe, it is evident that IT staff are the most in demand. Therefore, according to official data collected in the Employment Offices in BiH, IT experts are one of the most sought-after in the labor market, and at the same time one of the least present in the unemployment registers.

According to the document "Recommendations for Educational Enrollment Policy in Tuzla Canton", which was developed by the Government of Tuzla Canton during 2013, the results of the analysis and research of the labor market needs of Tuzla Canton were given. According to them, in the coming period, about 3,500 workers are expected to be employed annually, of which 12.4% or 435 would have a university degree, 38.1% or 1333 would have a high school diploma and 49.5% or 1729 would have a higher vocational qualification, vocational qualification, or unqualified.

Regarding higher education, branches of technical education are the most represented with 55.4% or a requirement for about 240 technical engineers per year. Within the branches of technical education, the greatest demand is for mechanical engineers and electrical engineers. This study program will enable the creation of a qualified workforce that will be able to respond to the needs of the labor market and 240 technical engineers on an annual basis.

2. COMPLIANCE OF THE STUDY PROGRAM "INFORMATION TECHNOLOGY" WITH THE LAW ON HIGHER EDUCATION OF TUZLA CANTON (LOVOTK)

The study program "Information Technology" is aligned with Article 122 of the Law on Higher Education of Tuzla Canton and contains the following elements:

2.1. COURSE DESCRIPTION

The study program "Information Technology" is designed and structured in accordance with the Law on Higher Education of Tuzla Canton and the Bologna Declaration with the aim of educating students to acquire fundamental knowledge in the fields of computing, information technology, and business processes. This prepares them for active participation in the job market as well as for independently initiating business projects.

2.2. STUDY DURATION

The duration of the program "Information Technology" is three years (6 semesters). This is a first-cycle study program, and upon completion the student should earn 180 ECTS credits.

2.3. PROFESSIONAL OR ACADEMIC TITLE AND QUALIFICATIONS AWARDED UPON COMPLETION OF STUDIES

Upon completing the study program "Information Technology," the student is awarded the title **Bachelor of Engineering in Information Technology**.

2.4. CONDITIONS FOR ENROLMENT IN STUDIES

The right to enroll in the study program "Informatics and Computing" is granted to candidates who are citizens of Bosnia and Herzegovina, foreign citizens and stateless persons who have completed a four-year high school in Bosnia and Herzegovina, as well as candidates who have completed secondary school outside Bosnia and Herzegovina, and for whom, after the procedure of nostrification or equivalence, it has been determined that they have completed appropriate secondary education.

When enrolling in the study program, the ranking of candidates will be made based on the conducted tests and other criteria stipulated by the Senate of the IPI Academy.

2.5. ANTICIPATED LEARNING OUTCOMES THAT ARE OBTAINED BY FULFILLING THE STUDY OBLIGATIONS WITHIN THE FRAMEWORK OF THE STUDY PROGRAM

The successful implementation of the "Information Technology" study program enables graduates to acquire both general and specific competencies and skills, as a basis for their active and successful inclusion in the labor market, and later in private or public companies. Learning outcomes of the study program "Information Technology are aligned with contemporary scientific requirements and international experiences.

Completion of this study program will enable students to:

- acquire basic theoretical knowledge related to the development and implementation of software and information systems;
- acquire knowledge of the role and importance of informatics in a business entity and training for the development of business information systems in their work environment;
- identify business problems that are suitable for solving with advanced ICT;
- plan and design components of complex information systems, such as: modern technologies for developing business applications and data modeling, use of software development tools, security technologies of operating systems and networks;
- know and be able to apply methods in the development of software support for simple organizational processes at the level of execution;
- administer and maintain computer networks;
- acquire knowledge of the essence and mastery of the concept of e-business with a strong focus on the practical application of the acquired knowledge;
- acquire knowledge about and implement different e-business models (e-commerce, e-marketing, e-banking, m-commerce);
- understand the security aspects of e-commerce;
- design and develop information systems;

- independently write programs in C++ and Java;
- design databases with the ability to administer them;
- acquire knowledge and understand basic economic concepts, financial planning and ways of financing companies;
- plan, collect, and analyze large amounts of data;
- design and maintain a website;
- adapt software products to the needs of the organization that uses them;
- develop multimedia resources;
- master practical knowledge that enables them to start and manage their own business projects.

2.6. OUTLINE CONTENT OF COMPULSORY AND ELECTIVE COURSES AND THE NUMBER OF HOURS REQUIRED FOR THEIR IMPLEMENTATION

The curriculum of the study program 'Information Technology' is provided in table 1. The curriculum contains a list of compulsory and elective course and the number of hours required for their implementation, as well as the corresponding number of ECTS points. The curricula of individual teaching disciplines (syllabi) are attached.

Table 1. Study course: **INFORMATION TECHNOLOGY**

FIRST YEAR					
Ord. number	**Code**	**Course title**	**Semester**	**Number of hours**	**ECTS credits**
1.	O1	Mathematics	1	3+3+0	6 (compulsory)
2.	R1	Introduction to Computing and Information Technology	1	2+3+0	6 (compulsory)
3.	R2	Fundamentals of Programming	1	2+1+2	6 (compulsory)
4.	IP1	Elective course 1	1		2x6 (elective)
5.	IP2	Elective course 2	1		
6.	I1	Introduction to Computer Information Systems	2	2+3+0	6 (compulsory)
7.	R3	Data Structures and Algorithms	2	2+3+0	7 (compulsory)
8.	R4	Operating Systems	2	2+2+1	6 (compulsory)
9.	IP3	Elective course 3	2		6 (elective)
10.	O2	Business English	2	2+2+0	5 (compulsory)
Total hours of active teaching				21+29=50	
Total ECTS					60
SECOND YEAR					
Ord. number	**Code**	**Course title**	**Semester**	**Number of hours**	**ECTS credits**
1.	R5	Programming Languages and Programming	3	2+1+2	6 (compulsory)
2.	R6	Computer Networks	3	2+3+0	6 (compulsory)

3.	I2	Information System Development and Construction	3	2+3+0	6 (compulsory)
4.	IP4	Elective course 4	3		2x6 (elective)
5.	IP5	Elective course 5	3		
6.	R8	Databases	4	2+2+1	6 (compulsory)
7.	I4	E-Business	4	2+3+0	6 (compulsory)
8.	R9	Object-oriented Programming	4	2+2+1	6 (compulsory)
9.	IP6	Elective course 6	4		2x6 (elective)
10.	IP7	Elective course 7	4		
Total Hours of Active Teaching				20+30=50	
Total ECTS					60

THIRD YEAR

Ord. number	**Code**	**Course title**	**Semester**	**Number of hours**	**ECTS credits**
1.	I5	E-Commerce	5	2+3+0	6 (compulsory)
2.	I6	Electronic Banking Payment System	5	2+3+0	6 (compulsory)
3.	R7	Web programming	5	2+1+2	6 (compulsory)
4.	IP8	Elective course 8	5		2x6 (elective)
5.	IP9	Elective course 9	5		
6.	I11	Customer Support Technologies and Systems	6	2+3+0	6 (compulsory)
7.	IP10	Elective course 10	6		2x6 (elective)
8.	IP11	Elective course 11	6		
9.		Practice	6		2 (compulsory)
10.		Final paper	6		10 (compulsory)
Total Hours of Active Teaching (5th and 6th semester)				16+24=40	
Total ECTS					60
Total Hours of Active Teaching (from 1st to . semester)				57+83=140	
Total ECTS (for 6 semesters)					**180**

List of elective courses

Winter semester		***Summer semester***	
Code	**Course title**	**Code**	**Course title**
I10	Business Informatics	M3	Multimedia technologies
BOF8	Fundamentals of Economics	MIB3	Management
TK1	Business communication	M5	Digital photography
M7	Computer Graphics and Animation	MIB5	Business Trade
BOF10	Applied Financial Management	M1	Multimedia Publishing
I3	Fundamentals of Marketing and Internet Marketing	M2	Video production
TK9	Direct marketing	O3	Business Law and Taxes
M6	Web design	MIB4	Entrepreneurship
MIB6	Project Management	I7	E-services

MIB1	Statistics and Research Methods	I12	Information Systems Management
		TK12	Public speaking techniques
As well as all other courses that are taught in the corresponding winter and summer semesters in all study programs at IPI Academy.			

2.7. CREDIT VALUE OF EACH COURSE DETERMINED IN ACCORDANCE WITH ECTS

The point value of each course and final thesis expressed in ECTS credits can be found in the previous table 1.

2.8. FORM OF TEACHING AND METHODS OF ASSESSMENT FOR EACH SUBJECT

Studies in this study program will be organized as full-time studies, part-time studies and distance learning. The method of testing knowledge can be oral, written and practical, or a combination of the above methods.

2.9. LIST OF COURSES THAT THE STUDENT CAN CHOOSE FROM OTHER STUDIES

Students will be offered, within the elective courses, in addition to the possibility of choosing from the list of elective courses, compulsory courses from other study programs according to the student's affinities, in accordance with the Study Rules.

In relation to the type of subject, compulsory professional subjects participate with 50%, elective professional with 36,66%, while general subjects and professional practice and undergraduate thesis participate with 6,67%, which is in accordance with international standards. This is presented in Table 2.

Table 2. Structure of subjects in the curriculum

Ord.no.	Course Type	Number	%
1.	General	2	6.67
2.	Professional – compulsory	15	50.00
3.	Professional - elective	11	36.66
4.	Undergraduate Thesis and Professional Practice	2	6.67
5.	Total	30	100.00

2.10. CONDITIONS FOR ENROLMENT OF STUDENTS IN THE NEXT SEMESTER OR THE NEXT ACADEMIC YEAR AND THE MANNER OF COMPLETION OF THE STUDY

The condition for enrollment in the next semester is the verification of the previous semester. Verification of the semester and academic year is mandatory for all students. The number of ECTS study credits achieved by the student is determined on the basis of the verified semester and academic year.

The winter semester is verified after the end of the winter semester, and the verification of the summer semester after the end of the summer semester classes. Verification of the semester and enrollment in the academic year takes up to two weeks.

The student enrolls in the next year of study on the basis of the achieved ECTS credits from the previous year of study. Students can transfer to the next year of study within one cycle of study a maximum of 10 (ten) ECTS study credits or a maximum of two courses regardless of how many ECTS study credits they carry together.

2.11. PROVISIONS UNDER WHICH STUDENTS WHO HAVE INTERRUPTED THEIR STUDIES OR HAVE LOST THE RIGHT TO STUDY CAN CONTINUE THEIR STUDIES

A student whose status as a student at the IPI Academy has ceased due to the fact that he or she has not enrolled in the next year of study, has not renewed the enrollment in the same year within the prescribed period, and whose rights and obligations as a student are not suspended, may regain the status of a student of the IPI Academy Tuzla, provided that there are spatial and personnel possibilities for this.

A student whose status as a student at the IPI Academy has been terminated due to the imposition of a disciplinary measure may continue his/her studies after the expiry of the deadline established by the Decision on the measure, whereby the student continues to exercise his/her rights and obligations under the curriculum being applied at the time of regaining the status of a student.

In both cases, the student must submit an application for regaining student status before the beginning of the academic year.

The re-enrollment of student status is approved by the Director of IPI Academy. This Director’s decision determines the student's obligations in accordance with the valid curriculum. Re-enrollment of student status can only be granted once during the course of study at the IPI Academy.

2.12. CONDITIONS FOR TRANSFER FROM OTHER STUDY PROGRAMMES WITHIN THE SAME OR RELATED FIELDS OF STUDY

Students from other study programs of the IPI Academy are allowed to transfer to the study program "Information Technology" under the conditions and in the procedure determined by the Statute and the Rules of Study at the IPI Academy.

Students from other higher education institutions, from the same or related fields of study, will be allowed to transfer and continue their studies in the study program " Information Technology " at the IPI Academy under the conditions and in the procedure determined by the Statute and the Rules of Study at the IPI Academy.

When changing the study program and transferring from another higher education institution, the student must submit an application before the beginning of the academic year. The documentation attached to the application is determined by the Statute, the Rules of Study and the Rulebook on the Recognition of Passed Exams at the IPI Academy.

3. EMPLOYMENT OPPORTUNITIES FOR STUDENTS WHO ATTENDED AND COMPLETED THE STUDY PROGRAM "INFORMATION TECHNOLOGY“

Completion of studies in the study program "Information Technology" offers a wide range of employment opportunities due to a wide range of multidisciplinary knowledge. Graduates of this study program can find employment:

- engineer of informational systems;
- at IT departments of companies and public institutions;
- at all departments of ICT business;
- as IT adviser/specialist/manager;
- as web programmer and web designer;
- as computer system administrator and database administrator;
- as system administrator;
- as data analysis specialist;
- as manager of customer-based service applications;
- as online business manager;
- as eBanking manager, eCommerce manager or eServices manager;
- as founder of startup company.
- All organizations that do not have an independent IT department, but it is necessary to perform other business tasks in addition to working on information and communication tasks
- as an IT consultant/specialist/manager
- as a web developer and web designer
- as an administrator of computer systems, computer networks and databases
- as a system administrator
- as a Database Analyst
- as the head of the application user service
- as an e-commerce manager
- as a manager in an online company
- as a manager for e-banking, e-commerce, e-services (education, administration)
- and can start his/her own start-up company.

ANNEX 1 SYLLABUS OF THE STUDY PROGRAM „INFORMATION TECHNOLOGY “

FIRST YEAR

Compulsory courses

Full course title:		**Mathematics**
Course code:		**O1**
Module level (education cycle):		**First cycle**
Year of study:		**I**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**First (winter) semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Compulsory**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**3**
Auditory exercises:		**3**
Laboratory exercises:		**0**

Course objectives:

The goal of the course is to acquire basic mathematical knowledge necessary for the follow-up of subsequent study subjects, and mathematical knowledge that can have appropriate economic application. In addition, the course aims to master algebra, mathematical analysis, the fundamentals of differential calculus, and discrete structures, which is fundamental to computer science. An additional goal of the course is to get acquainted with the concept of the time value of money and financial mathematics, as a general course for understanding all important calculations in business processes in the financial sector in general.

Learning outcomes:

Upon completion of this course, students will be able to:

- use basic functions;
- understand the requirements for the application of Information Technology in production, research and service activities;
- design mathematical models in program projects;
- solve simple and complex mathematical problems and software algorithms in the process of creating programs;
- understand the criteria for the convergence test;
- master the techniques of differential calculus of a function of a real variable;
- use software to solve math problems;
  use the power of calculus to solve problems.

COURSE CONTENT

- The Foundations of Mathematical Logic
- Sets (set of natural numbers, set of integers, set of rational numbers, set of real numbers)
- Mathematical induction
- Binomial pattern
- A set of complex numbers

- Relation. The Basics of Linear Algebra
- Determinant matrix i
- Systems of linear equations
- Arrays and rows
- Functions of a single variable (notion of a function, limit value of a function, derivative of a function, graph of a function)
- Polynomials. Differential calculus
- The concept and characteristics of the derivative
- The Basics of Integral Accounting. Differential of function (application)
- Graphical and tabular representation of economic phenomena. A percentage account. Basic calculations in economics. Applications of Simple and Complex Interest Accounts
- Loans. Continuous capitalization. Methods for evaluating the effectiveness of investment projects

GRADING SYSTEM

Pre-exam obligations - After week 7, students take Test 1, with assignments covering half of the course material. - In the last week of lectures, students take test 2, with tasks from the second part of the material covered (4 tasks scored with a maximum of 5 points for each). - Seminar paper	- Test 1 20 points - Test 2 20 points - Term paper 5 points - Participation 5 points
The final exam includes short theoretical questions from all over the material, with appropriate examples to demonstrate the learned theorems and rules.	50 points
TOTAL	**100**

REQUIRED LITERATURE

1. Vugdalić, R., 2013, Matematika, Univerzitet u Tuzli, Tuzla.
2. Nurkanović, M., 2013, Matematika za ekonomiste, PrintCom, Tuzla.

ADDITIONAL LITERATURE

1. Vugdalić, R., 2009, Matematika, Diferencijalni i integralni račun funkcije jedne realne promjenljive, Teorija i zadaci, Univerzitet u Tuzli, Tuzla.
2. Neralić L., Šego B., 2009, Matematika, Element, Zagreb.
3. Smajlović, L., 2010, Matematika za ekonomiste, Ekonomski fakultet Sarajevo, Sarajevo.
4. Šego B., Lukač Z., 2011, Financijska matematika, RRiF plus, Zagreb.
5. Ivovič, M., Boričić, B., Azdejković, D., Stanojević, J., 2008, Zbirka zadataka iz matematike, Ekonomski fakultet, Beograd.
6. Trklja, B., 2008, Financijska matematika, Ekonomski fakultet u Sarajevu, Sarajevo.
7. Boričić, B., Ivović, M., 2008, Matematika, Ekonomski fakultet, Beograd.
8. Drpljanin, S., Matematika, 1997, Univerzitet u Tuzli, Tuzla.
9. Dedagić, F., Uvod u višu matematiku, Univerzitet u Tuzli, Tuzla.
1. Smajlović, L., 2010, Matematika za ekonomiste, Ekonomski fakultet Sarajevo, Sarajevo.

MANDATORY EQUIPMENT:	N/A
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Instruction is delivered through lectures (theory with examples) and exercises (solving tasks with applications), as well as homework assignments that follow the tasks from the exercises.

Full course title:		**Introduction to Computing and Information Technology**
Course code:		**R1**
Module level (education cycle):		**First cycle**
Year:		**I**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**First (winter) semester**
Study program:		**Information Technology**
Lecturer:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Compulsory**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**3**
Laboratory classes:		**0**

Course objectives:

The aim of the course is to acquire basic knowledge in the field of computer hardware, software and the Internet, as essential prerequisites for further study of information and communication technologies and programming in general, and to see the importance of the impact of IT on society, its advantages and disadvantages. Students will understand the principles of mobile and wireless technologies, the development and application of which today takes a leading role in IT, and will get acquainted with the concepts of data, information, the way of recording data, material carriers of data content, the concept of information system, functions and elements of an information system, the relationship between information and communication systems, areas of application of information systems, the Internet and the development of Internet applications. In addition, the goal is for students to understand the principles of wireless and mobile communications whose development and application takes a leading role in IT.

Learning outcomes:

Upon completion of this course, students will be able to:

- identify the basic hardware and software components of computers, i.e. elements of information and communication technologies;
- understand and explain their basic characteristics as well as development tendencies;
- select or propose the selection of appropriate components of IT equipment depending on their purpose;
- understand how information networks are used in computing and distinguish between different ways of connecting to the Internet.

COURSE CONTENT

- The concept and role of the computer, the parts of the computer, the functioning of the computer.
- Computer user interface. Typical user programs.
- Hardware: the basic hardware components of the computer, the reliability of the hardware.
- Software: types of software, system and user software, development and importance of localized versions of software, reliability of software.

- Fundamentals of Information and Internet Technologies
- Data description of reality
- Computer as part of an information system
- Communication systems
- Computer networks (network classification, network devices, topologies)
- Internet (services, protocols, infrastructure) and Web (architecture, protocols)
- Wireless and mobile communications (basics, standards, wireless local area networks, cellular networks, mobility in wireless networks, satellite communications, GPS)
- HTML, CSS, XML, AJAX
- Content Management Systems (CMS)
- Web services, service-oriented architecture
- Technologies for communication and collaboration

GRADING SYSTEM

PRE-EXAM OBLIGATIONS - In the middle of the semester, a test is held with questions that include half of the material covered. Through the test, knowledge of basic concepts in the field of computer science and information technology is tested. - The topic for the seminar paper is chosen no later than the 5th week of teaching, and the paper is submitted no later than the 10th week of teaching and presented in the premises of the IPI Academy in the term of the last 3 auditory exercises. - Continuously during lectures and exercises, the presence and activity of students is monitored and recorded, on the basis of which an adequate number of points is awarded.	- Test – 20 points - Seminar paper – 20 points - Attendance and participation – 10 points
- The final exam includes theoretical aspects of hardware and software components of computers, i.e. elements of information and communication technologies, and their basic characteristics as well as development tendencies.	- Final exam – 50 points
TOTAL	**100 points**

REQUIRED LITERATURE

1. Kurose, J. F., Ross, K. W., 2018, Umrežavanje računara: Od vrha ka dnu, sedmo izdanje, CET, Beograd.
2. Bajgorić, N., 2006, Informacijska tehnologija, Univerzitetska knjiga, Mostar.

ADDITIONAL LITERATURE

1. Pokorni, S., Radić, G., 2010, Informacione i Internet tehnologije, Visoka škola strukovnih studija za informacione tehnologije, skripta, Beograd.
2. Marković, M., 2010, ECDL 5.0 Modul 1: Osnove informacionih i komunikacionih tehnologija, Mikro knjiga, Beograd.

<table>
<tr><td colspan="2">3. Kumar, A., 2002, Internet And Information Technology, Anmol Publications Pvt. Ltd., New Delhi.
1. Turban, E., Rainer, R.K, Potter, R. E., 2005, Introduction to Information Technology, 3nd ed., John Wiley & Sons Inc., New Jersey.</td></tr>
<tr><td>MANDATORY EQUIPMENT:</td><td>Projector, Desktop Computers, Computer Disassembly Toolkit, Operating System Installation Media, Multimedia and Office Software, Computer Security Software, Internet Access, Switch, UTP Cable, Wi-Fi Adapters</td></tr>
<tr><td>ADDITIONAL EQUIPMENT:</td><td>N/A</td></tr>
<tr><td colspan="2">METHODS OF CONDUCTING CLASSES
Teaching is carried out through lectures, demonstration and independent laboratory exercises.</td></tr>
</table>

Full course title:		**Fundamentals of Programming**
Course code:		**R2**
Module level (education cycle):		**First cycle**
Year:		**I**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**First (winter) semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Compulsory**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**1**
Laboratory classes:		**2**

Course objectives:

The objective of the course is to master the fundamental principles of programming, which are the necessary basis for any further programming and design, as well as to get acquainted with the C programming language. An additional goal of the course is to ensure that students can analyze already written programs in the C programming language, and to enable students to apply good software engineering practices to implement correct, efficient, and well-structured programs as problem-solving schemes.

Learning outcomes:

Upon completion of this course, students will be able to:

- create programs by using C programming language.
- analyze programs written in C programming language.
- master basic programming techniques and concepts;
- use the CodeBlocks IDE environment with an initial skill level;
- write and use intermediate complex regular expressions.
- write complex C declarations.
- write C code using complex operations and pointer declarations.

COURSE CONTENT

- Introduction and principles of programming languages. Syntax of programming languages. Division of programming languages.
- Basic programming techniques. C as a programming language. Declaration and implementation of the code. Compiling, linking, and running programs, the syntax of the C programming language.
- Data types. Expressions and statements. ASCII table. Keywords and reserved words.
- Operators. Arithmetic, logical, relational, and bit operations. Operator priority.
- Control flow. If , If-else and switch-case constructs. Additional program flow control commands (continue, go-to, break).
- Loops. For, While, Do-while loops. Infinite loops. Nested loops. . Ternary (Conditional) Operator.
- Functions. Procedures. Recursion. Function parameters. Transfer of parameters when a

function is called. Arguments to the main function. Function libraries. User-defined function libraries.

- Arrays. Single-digit strings. Two-dimensional arrays (matrices). Multidimensional arrays. Strings.
- Pointers. Pointing arithmetry. Function pointers.
- Structure. Work with structures. Arrow operator. Union. Fields of bits.
- Files (files). Work with files. Opening and closing files. Write to files and read from files. Binary and text files.
- Dynamic memory allocation Memory deallocation.
- Linked lists. Circular lists. Doubly-linked lists. Doubly-linked circular lists.
- Macros. predefined macros. Macro parameterization.
- Functions with a variable number of parameters. Void pointers.

GRADING SYSTEM

PRE-EXAM OBLIGATIONS - Partial Exam – Assessment of theoretical and practical knowledge. The exam is given in the middle of the semester after the covered areas. - Project Task – A set of tasks to be completed 7 days before the exam, assigned in the middle of the semester. - Attendance, participation, and exercises.	**20%** **25%** **5%**
Final exam – A set of tasks in the C programming language covering all the topics studied throughout the semester.	**50%**
TOTAL	**100%**

REQUIRED LITERATURE

1. Ritchie, M. D., Kernighan, B. W., 2003, Programski jezik C, drugo izdanje, CET, Beograd.
2. Kraus, L., 2009, Rešeni zadaci iz programskog jezika C, Akademska Misao, Beograd.

ADDITIONAL LITERATURE

1. Prljača, N.,Glavić, M., 1999, Programiranje u C programskom jeziku, Fakultet elektrotehnike Tuzla.
2. Kraus, L., 2008, Programski jezik C sa rešenim zadacima, Akademska Misao , Beograd.
3. Lipljin, N., 2004, Programiranje, Tiva-FOI, Varaždin.
4. Oualline, S., 1993, Practical C Programming, O'Reilly & Associates, Inc. California, USA.
5. Džafić, I., Kasumović, S., 2000, Zbirka riješenih zadataka u C programskom jeziku, Bosanska riječ, Tuzla.

MANDATORY EQUIPMENT:	Computer
ADDITIONAL EQUIPMENT:	Software: IDE (Integrated Development Environment), CodeBlocks or another equivalent

TEACHING METHODS: Instruction is delivered through lectures, exercises, and writing assignments, which involve writing programs to solve assigned problems

Full course title:		**Introduction to Information Systems**
Course code:		**I1**
Module level (education cycle):		**First Cycle**
Year of study:		**I**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Second (summer) semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Compulsory**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**3**
Laboratory classes:		**0**

Course objectives:

The aim of this course is for students to master basic concepts in the field of information systems, understand how to use information systems within a global organization, and become proficient in the process of IS (Information Systems) development. Additionally, the course aims to provide students with knowledge about the key components of information systems (people, software, hardware, data, and communication technologies) and how to integrate these components to create a competitive advantage. Students will also learn to understand how information systems are used in enterprises to improve quality, dynamics, and competitiveness, as well as to familiarize themselves with the tools and procedures for developing information systems.

Learning outcomes:

Upon completing this course, students will be able to:

- understand how and why information systems are used, and how they enable new forms of commerce between individuals, organizations, and governments
- identify the technological, individual, and organizational components of information systems
- explain globalization and the role that information systems have played in this evolution
- compare how enterprises use information systems for competitive advantage versus competitive necessity
- identify the main components of information systems infrastructure
- describe current and emerging technologies that enable new forms of communication, collaboration, and partnership
- classify different types of information systems based on how they provide information needed to create business intelligence for decision support across various levels and functions within an organization
- explain how organizations develop and acquire information systems
  plan how to secure information resources, focusing on people and technology

CONTENTS OF THE COURSE

- Modern organization in a web-based global environment

- Basics of information systems development
- Structured systems analysis
- E-business and E-commerce
- Data modeling: entity-relationship models, relational model
- Information systems architecture
- The role of information systems in organizations
- Information systems technologies
- Information systems as business support
- Wireless mobile computing and mobile commerce
- Information systems development
- Information systems usage and maintenance
- Analytical processing: decision support systems
- Ethical, social, and global aspects of information systems
- Purchasing information systems and applications

GRADING SYSTEM

PRE-EXAM OBLIGATIONS: - In the 7th week of the term, the first assessment is conducted – Test 1 - In the 14th week of the term, the second assessment is conducted - Test 2. - Students' participation during lectures and exercises is awarded a maximum of 10 points.	- Test 1 20 points - Test 2 20 points - Participation 10 points
The final exam covers the entire material that was addressed during the lectures.	50 points
TOTAL	**100 points**

REQUIRED LITERATURE

1. Rainer, R. K. Jr., Turban, E., 2009, Uvod u informacione sisteme podrška i transformacija poslovanja, 2. izdanje, Data Status, Beograd.

ADDITIONAL LITERATURE

1. Rainer, R. K. Jr., Prince, B., Cegielski, C., 2013, Introduction to Information Systems: Supporting and Transforming Business, 5th edition, Wiley, NY.
2. Bajgorić, N., 2003, Informacijska tehnologija, 3. izdanje, Univerzitetska knjiga, Mostar.
3. Stair, R., Reynolds, G., 2012, Fundamentals of Information Systems, Course Technology, Boston.
4. Rainer, R. K. Jr., Prince, B., 2015, Introduction to Information Systems, 6th edition, Wiley, NY.

MANDATORY EQUIPMENT:	Laptop and projector
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Instruction is delivered through lectures, exercises, business case analysis, and the creation and presentation of seminar papers.

Full course title:		**Data Structures and Algorithms**
Course code:		**R3**
Module level (education cycle):		**First cycle**
Year of study:		**I**
ECTS credits:		**7**
Duration:		**One semester**
Semester:		**Second (summer) semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Compulsory**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**3**
Laboratory classes:		**0**

Course objectives:

The aim of this course is to familiarize students with the essential characteristics of data structures and algorithms. Additionally, the objectives include understanding and analyzing the complexity of algorithms, gaining practical knowledge for implementing address, search, and sorting algorithms in a high-level programming language (Java), and acquiring practical skills for implementing basic data structures in a high-level programming language. An additional aim is to enable students to independently follow the software product development process.

Learning outcomes:

Upon completing this course, students will be able to:

- determine the complexity of an algorithm
- understand algorithm models
- implement hashing, search, and sorting algorithms in a high-level programming language
- implement various data structures in a high-level programming language.
-

CONTENTS OF THE COURSE

- Basic concepts of data structures and algorithms
- Historical development of data structures and algorithms. Algorithm models.
- Algorithmic unsolvability, solvability, and complexity
- Basic classification of data structures
- Linear lists
- Applications of stacks as data structures
- Linked lists, circular lists, and queues
- Relative expressive power of subclasses of the class of linear lists
- Trees
- Binary trees and their applications
- Graphs
- Sorting algorithms
- Searching algorithms
- Ad hoc measures of algorithm complexity
- Statistical measures of algorithm complexity

GRADING SYSTEM

PRE-EXAM OBLIGATIONS: - Test covering 50% of the material (theoretical and practical parts) in 8th week of instruction. - Test from laboratory exercises (practical part) at the end of the semester. - Attendance and students' participation in classes.	Test – 20 points Test from laboratory exercises – 20 points Attendance and participation – 10 points
The final exam (theoretical and practical parts)	50 points
TOTAL	100 points

REQUIRED LITERATURE

1. Stephens, R., 2013, Essential Algorithms, John Wiley & Sons, Indianapolis.
2. Tomašević, M., 2008, Algoritmi i strukture podataka, Akademska misao, Beograd.

ADDITIONAL LITERATURE

1. Horowitz, E., 2008, Computer algorithms, 2. izdanje, Silicon Press, New Jersey.
2. Sedgewick, R., 2016, Algorithms, 4. izdanje, Pearson Education, Boston.
3. Cormen, T., 2022, Introduction to algorithms, 4. izdanje, MIT Press, Cambridge.
4. Weiss, M.A., 1997, Data structures and algorithm analysis in C, 2. izdanje, Addison-Wesley, Boston.
5. Sedgewick, R., 1997, Algorithms in C, 3. izdanje, Addison-Wesley, Boston.

MANDATORY EQUIPMENT:	Projector, desktop computers, Netbeans IDE software with C++11 compiler and Java SE Development Kit
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Instruction is delivered through lectures and practical laboratory exercises.

Full course title:		**Operating Systems**
Course code:		**R4**
Module level (education cycle):		**First cycle**
Year:		**I**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Second (summer) semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Compulsory**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**2**
Laboratory classes:		**1**

Course objectives:

The aim of this course is to introduce students to the principles of operating system functionality, its organization, structure, and implementation. The course also aims to train students to understand the purpose of operating systems, specifically that operating systems must allocate computing activities to ensure efficient utilization of computer resources. Additionally, the course aims to introduce students to another purpose of operating systems, which is to provide a suitable environment for program preparation and execution.

Learning outcomes:

Upon completing this course, students will be able to:

- Master the principles of operating systems, their organization, structure, and implementation.
- Recognize common features of an operating system, including what the operating system does for the user and what it does for the computer.
- Understand the concepts of processes and concurrency that are at the heart of modern operating systems.
- Understand methods for process scheduling, inter-process communication, process synchronization, and deadlock management.
- Analyze how files, input-output devices, and large storage are managed in modern computer systems.
- Apply mechanisms necessary for the protection and security of computer systems.

COURSE CONTENT:

- Concept and history of operating systems
- Operating system kernel and process management
- CPU scheduling and process allocation
- Process synchronization - Synchronization problem. Critical section.
- Deadlock - System model and deadlock characteristics. Deadlock management methods – prevention. Deadlock avoidance. Detection and recovery from deadlock.
- Memory management
- Virtual memory
- Input-output subsystem - Functions of the input-output subsystem. Device classification. Hardware relevant to the input-output subsystem. Uniform interface to applications provided by the input-output subsystem. Performance of the input-output subsystem.

- Secondary and tertiary memory
- File systems - Concept of files. Concept of directories. References. File sharing and protection. Basics of file systems. File space allocation. Free space management. File system reliability.
- Network environment
- Distributed systems - Introduction to distributed systems. Types of network-oriented operating systems. Distributed file systems. Process synchronization in distributed systems. Atomic transactions in distributed conditions. Deadlock management in distributed conditions.
- Security and protection
- Operating system interface (scripts and system calls)
- Types of operating systems (distributed and real-time operating systems, distributed operating systems).

GRADING SYSTEM

PRE-EXAM OBLIGATIONS: - Patial exam – assessment of theoretical and practical knowledge. The exam is scheduled for the midpoint of the semester after the covered topics. - Project task – a set of tasks to be completed 7 days before the exam – assigned at the midpoint of the semester. - Attendance in classes, students' participation, and exercises.	20% 25% 5%
Final Exam: The final exam includes all the topics covered.	50%
TOTAL	**100%**

REQUIRED LITERATURE

1. Đorđević, B., Pleskonjić, D., Maček, N., 2006, Operativni sistemi: Teorija, praksa i rešeni zadaci, Mikro knjiga, Beograd.
2. Đorđević, B., Pleskonjić, D., Maček, N., 2006, Operativni sistemi: UNIX i Linux, Mikro knjiga, Beograd.

ADDITIONAL LITERATURE

1. Stallings, W., 2013, Operativni sistemi: principi unutrašnje organizacije i dizajna + CD, Prevod sedmog izdanja, CET, Beograd.
2. Budin, L., Golub, M., Jakobović, D., Jelenković L., 2010, Operacijski sustavi, Element, Zagreb.
3. Silberschatz, A., Galvin, P. B., Gagne, G., 2009, Operating System Concepts –John Wiley & Sons, NY.
4. Distributed Operating Systems – Andrew S. Tanenbaum, 1994, Prentice Hall, New York
5. Doeppner, T., 2011, Operating Systems in Depth, John Wiley & Sons, NY.
6. McIver McHoes, A., Flynn, I. M., 2012, Understanding Operating Systems, Nelson Education, Canada.

MANDATORY EQUIPMENT:	Computer
ADDITIONAL EQUIPMENT:	Software: VirtualBox, installation of operating system Linux Ubuntu, Hyper-V

METHODS OF CONDUCTING CLASSES:
Instruction is delivered through lectures, practical laboratory exercises, and project work.

Full course title:		**Business English**
Course code:		**O2**
Module level (education cycle):		**First cycle**
Year:		**I**
ECTS credits:		**5 ECTS**
Duration:		**One semester**
Semester:		**Second (summer) semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Compulsory**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**2**
Laboratory exercises:		**0**

Course objectives:

The aim of this course is to introduce students to business and informatics terminology, as well as the lexical and grammatical specificities of the English language, and the role of English in an international context. Additionally, the course aims for students to develop oral and written communication skills using professional and formal forms of English, through writing business letters, electronic media communication, and oral presentations.

Learning outcomes:

Upon completing this course, students will be able to:

- master business and informatics terminology in English
- communicate in English language
- write business letters for various purposes
- independently do presentations in English.
-

COURSE CONTENT:

- Basics of English grammar
- Corporate culture
- Understanding and using informatics terminology
- Understanding and using international business terminology
- Informal and formal communication
- Communication through electronic media
- Writing business letters (complaint letters, orders, recommendation letters, etc.)
- Writing CVs, biographies, cover letters
- Writing job applications
- Making business deals, negotiating
- Teamwork
- Reading authentic business and informatics articles (newspapers, internet, etc.)
- Writing reports and presentations
- Using idiomatic phrases in verbal and written communication
- Understanding different informatics and business texts

GRADING SYSTEM

PRE-EXAM OBLIGATIONS: Midterm Tests: After 6 weeks of lectures, students are prepared for the midterm test to familiarize them with the types of tasks and the methodology of test-taking. In the 7th week, a test is conducted covering the material learned so far (half of the planned content). This midterm test is not graded and its purpose is to acquaint students with the methodology of the final test at the end of the semester.	/
Seminar paper: Students independently choose/formulate a topic closely related to the IT sector of Bosnia and Herzegovina, as well as the economic sector of Bosnia and Herzegovina, in consultation with the lecturer. The lecturer precisely presents the methodology for preparing the seminar paper during consultations, with a maximum length of 3 pages. The seminar paper must include all elements of this type of work (introduction, main part, and conclusion, including bibliography and scientific sources).	10
Pre-assessment seminar work– Students independently choose/formulate a topic closely related to the IT sector of Bosnia and Herzegovina, as well as the economic sector of Bosnia and Herzegovina, in consultation with the professor. A comparative approach with the above-mentioned sectors of another country is allowed. During consultations, the lecturer precisely presents the methodology for preparing the seminar paper with a maximum length of 6 pages. The seminar paper must include all elements of this type of work (hypotheses, objectives, introduction, main part, analysis, analysis results, and conclusion with bibliography and scientific sources).	30
Attendance, students' participation, and exercises: Participation in exercises with active involvement in work and interaction.	10
TOTAL	50
Final exam	50
TOTAL	**100**

REQUIRED LITERATURE

1. Whitby, N., 2013, Business Benchmark, Pre-Intermediate to Intermediate, Personal Study Book 8th Edition, Cambridge: Cambridge University Press.

ADDITIONAL LITERATURE

1. Duckworth, M., 2003, Business Grammar & Practice, Oxford: OUP.
2. Rosenberg, M., 2005, In Business: Activities to bring Business English to Life, Cambridge: Cambridge University Press.
3. Taylor, S., Gartside, L., 2004, Model Business Letters, E-mails & Other Business Documents. Harlow: Pearson Education Limited.
4. Haines, S., Nettle, M., Hewings, M., 2007, Advanced Grammar in Use Supplementary Exercises: with answers. Cambridge University Press, Cambridge.
5. Kiš, M., 2000, Englesko-hrvatski i hrvatsko-engleski informatički rječnik. Naklada Ljevak, Zagreb.
6. MacKenzie, I., 2002, English for business studies student's book: a course for business studies and economics students. Cambridge University Press, Cambridge.

MANDATORY EQUIPMENT:	Laptop, projector
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Instruction is delivered through lectures, seminars, exercises, problem-based language learning, group work, and presentations.

SECOND YEAR
Compulsory courses

Full course title:		**Programming Languages and Programming**
Course code:		**R5**
Module level (education cycle):		**First cycle**
Year:		**II**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Third (winter) semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Compulsory**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory classes:		**1**
Laboratory classes:		**2**

Course objectives:
The aim of this course is to introduce students to the capabilities and applications of general-purpose programming languages. Additionally, the course aims for students to acquire theoretical and practical knowledge in programming with C++ and Java, as well as to develop object-oriented programming skills.

Learning outcomes:
Upon completing this course, students will be able to independently:

- Write a program in C++;
- Write a program in Java;
- Create a graphical user interface in Java;
- Write object-oriented programs.

COURSE CONTENT

- Overview of programming languages
- Concept of object-oriented programming
- Overview of the C++ language
- Classes and objects
- Constructors and destructors
- Operator overloading
- Introduction to the Java programming language
- Basic elements of the Java language
- Control statements
- Basic data structures
- Introduction to graphical programming
- Dynamic memory allocation
- Containers and algorithms
- Generic programming
- Inheritance

GRADING SYSTEM

PRE-EXAM OBLIGATIONS - Test covering 50% of the material (theoretical and practical parts) in the 8th week of instruction. - Project work (design and implementation of an object-oriented program) by the 13th week of instruction. - Attendance and participation in classes.	Test – 20 points Project – 20 points Attendance and participation – 10 points
Final exam (theoretical and practical parts)	50 points
TOTAL	**100 points**

REQUIRED LITERATURE

1. Kraus, L., 2019, Programski jezik C++ sa rešenim zadacima, 11. izdanje, Akademska misao, Beograd.
2. Schildt, H., 2018, Java kompletan priručnik, 10. izdanje, Mikro knjiga, Beograd.

ADDITIONAL LITERATURE

1. Lippman, S., 2020, C++ Primer, 6. izdanje, Addison – Wesley, Boston.
2. Brokken, F., 2023, C++ Annotations, verzija 12.4.0 (https://fbb-git.gitlab.io/cppannotations/).
3. Schildt, H., 2022, Java The Complete Reference, 12. izdanje, McGraw – Hill, NY.
4. Eckel, B., 2006, Thinking in Java, 4. izdanje, Prentice Hall, NJ.

MANDATORY EQUIPMENT:	Projector, desktop computers, Netbeans IDE software with C++11 compiler and Java SE Development Kit
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Lectures, practical laboratory exercises, project design.

Full course title:		**Computer Networks**
Course code:		**R6**
Module level (education cycle):		**First cycle**
Year:		**II**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Third (winter) semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Compulsory**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**3**
Laboratory exercises:		**0**

Course objectives:

The aim of this course is to provide students with fundamental knowledge and skills in the field of computer networks, as well as the knowledge necessary to administer a peer-to-peer network (setting TCP/IP parameters, sharing, mapping, and working with basic network equipment) in Windows and Linux environments. Additionally, students will become familiar with the reasons for networking, types and topologies of networks, basic media for network implementation, as well as the OSI model and its application in Windows and Linux environments. Another objective of the course is to study the issues related to the design, installation, and maintenance of computer networks that use the TCP/IP protocol.

Learning outcomes:

Upon completing this course, students will be able to:

- understand networking methods
- distinguish between types, topologies, and components of computer networks
- comprehend OSI model
- administer a basic peer-to-peer network in the environments of leading operating systems.

COURSE CONTENT

- Basics of networking
- Internet - concept, services, protocols, access technologies, global structure, electronic commerce
- Types of computer networks. Network topology
- Network elements. Cabling of computer networks, OSI model, OSI model in the context of Windows and Linux operating systems, protocols, IP addressing, subnet mask concept
- Network equipment. Network administration
- Application layer – concept, architecture, protocols, DNS, DHT
- Transport layer – transport services and protocols, multiplexing, demultiplexing, flow control, congestion management, delay modeling
- Network layer – concept, basic functions, virtual circuit, datagram network, router architecture
- Network layer – addressing, subnets, tunneling, routing protocols, multicast communication
- Data link layer – concept, multiple access protocols, data link layer virtualization

- Web servers, client/server architecture in a network environment
- Example of network implementation, wireless networks
- Network security issues
- Solving tasks and problems related to subnetting. Cabling, TP cables, crimping
- Network operating systems, installing a server on a virtual machine and basic settings; working with IP addresses: masking, classes, MAC-IP-domain name association, routing; server configuration; installing Active Directory, DNS, creating users, groups, and policies, adding computers to a domain

GRADING SYSTEM

PRE-EXAM OBLIGATIONS - A mid-semester test covering half of the course material. The test assesses knowledge of basic concepts in the field of computer networks. - The topic for the seminar paper is chosen no later than the 5th week of instruction, and the paper is submitted no later than the 10th week of instruction. The presentation takes place at IPI Academy during the last three laboratory sessions. - Continuous monitoring and recording of student attendance and participation during lectures and exercises, which contribute to the final grade.	- Test – 20 points - Seminar work – 20 points - Attendance and participation – 10 points
- The final exam covers theoretical aspects of networking, including types, topologies, and components of computer networks, their basic characteristics, and development trends.	- Final exam – 50 points
TOTAL	**100 points**

REQUIRED LITERATURE

1. Kurose, J. F., Ross, K. W., 2018, Umrežavanje računara: Od vrha ka dnu, sedmo izdanje, CET, Beograd.

ADDITIONAL LITERATURE

1. Tanenbaum, A. S., Wetherall, D. J., 2021, Computer Networks, Sixth Edition, Prentice Hall, NJ.
2. Forouzan, B. A., 2021, Data Communications and Networking, Sixth Edition, McGraw-Hill, NY.
3. Halsall, F., 2005, Computer Networking and the Internet. 5th ed., Addison Wesley, Boston.

MANDATORY EQUIPMENT:	Projector, desktop computers, Wireshark software
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Instruction is delivered through lectures, demonstrative and independent laboratory exercises.

Full course title:		**Information system development**
Course code:		**I2**
Module level (education cycle):		**First cycle**
Year of study:		**II**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Third (winter) semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Compulsory**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory classes:		**3**
Laboratory classes:		**0**

Course objectives:

Students will become familiar with models and methods of software product development, including traditional and agile methods, as a comprehensive rounding off of the practical knowledge acquired so far in software development. Additionally, the course aims to guide students through the entire process of information system design, from defining user requirements to functional process modeling. The course also aims to acquaint students with real and practical challenges of software engineering from the perspective of a designer.

Learning outcomes:

Upon completing this course, students will be able to:

- understand the system design process.
- justify the reasons for applying engineering principles in software development.
- recommend and justify an appropriate software development method or team organization considering project specifics.
- organize requirements for a software system and create a software system specification.
- break down software system requirements into defined categories.
- recommend the use of an appropriate UML diagram for a specific aspect of the software process.
- identify areas for the possible application of agile methods and practices.

COURSE CONTENT

- Principles of ethics and professional conduct in software engineering
- Theory of information systems
- System analysis and user requirements
- System development processes and methods
- Information system planning
- System Development Life Cycle (SDLC), prototyping
- Joint Application Development (JAD), Structured Systems Analysis (SSA), data files, data dictionary
- Modeling tools
- System development tools, CASE technologies
- Unified Modeling Language (UML)
- Information system control and security
- Management Information Systems (MIS)
- Distributed information systems

- Agile development
- System architecture design
- Software engineering and intellectual property rights protection

GRADING SYSTEM

PRE-EXAM OBLIGATIONS: - After the first week of lectures, students receive a seminar paper topic related to software engineering ethics and a project assignment. - In exercises, students receive tasks to prepare for the project assignment. - Mid-semester, Test 1 is conducted with questions covering half of the course material. -Two weeks before the end of lectures, Test 2 is held, covering tasks from the remaining course material.	Seminar work – 5 points Project – 15 points Exercises – 5 points Test 1 – 10 points Test 2- 15 points
Final exam	50 points
TOTAL	**100** points

REQUIRED LITERATURE

1. Manger, R., 2016, Softversko inženjerstvo, Element, Zagreb.
2. Velić, M., Križ Z, 2014, Programsko inženjerstvo, Algebra, Zagreb.

ADDITIONAL LITERATURE

1. Sommerville, I., 2016, Software Engineering, 10th Edition. Pearson Education Inc, Boston MA, USA.
2. Senn, J. A.,1989, Analysis and Design of Information Systems, 2nd ed., McGraw-Hill, New York.
3. ISO/IEC/IEEE 15288:2015, Systems and software engineering -- System life cycle processes.
4. ISO/IEC 12207:2017, Systems and software engineering -- Software life cycle processes.
5. Booch, G., Rumbaugh, J., Jacobson, I., 2000, UML vodič za korisnike, CET, Beograd.
6. Naiburg, E., Maksimchuk, R., 2002, UML za projektovanje baza podataka, CET, Beograd.

MANDATORY EQUIPMENT:	Laptop, projector
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Instruction is delivered through lectures, exercises, essay writing, project documentation, case study analysis, and the preparation and presentation of seminar papers.

Full course title:		**Databases**
Course code:		**R8**
Module level (education cycle):		**First cycle**
Year of study:		**II**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Fourth (summer) semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Compulsory**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**2**
Laboratory exercises:		**1**

Course objectives:

The objectives of the course are to acquire theoretical and practical knowledge about data models and databases, and to gain theoretical knowledge about database management systems. An additional goal is to enable students to create and use relational databases.

Learning outcomes:

Upon completing this course, students will be able to:

- understand the architecture and components of database management systems
- independently design an entity-relationship schema for a database
- independently create a relational database
- independently use SQL (Structured query language) on a database.

COURSE CONTENT

- Database concept
- Data management
- Data models
- Database languages
- Database components and architecture
- Types of relationships in databases
- Database management systems
- Database design
- Database maintenance
- Database programs
- Structured query language (SQL)
- Creating forms and tables, creating queries
- Generating reports, user requirements analysis
- Storage, file structure, and indexing
- Special databases, case studies

GRADING SYSTEM

PRE-EXAM OBLIGATION: - Test covering 50% of the material (theoretical and practical) in the 8th week of instruction. - Project development (database design and implementation) by the 13th week of instruction. - Attendance and participation in classes	Test – 20 points Project – 20 points Attendance and participation – 10 points

Final exam (theoretical and practical)	50 points
TOTAL	**100 points**

REQUIRED LITERATURE

1. Silberschatz, A., 2019, Database System Concepts, 7. izdanje, McGraw-Hill, New York.

ADDITIONAL LITERATURE

1. Garcia, H., 2009, Database Systems: The Complete Book, 2. izdanje, Pearson Education, Boston.
2. Date, C. J., 2004, An Introduction To Database Systems, 8. izdanje, Pearson Education, Boston.
3. Ullman, J. D., 2008, A First Course In Database Systems, 3. izdanje, Pearson Education, Boston.
4. Foster, E. C., 2022, Database Systems: A Pragmatic Approach, 3. Izdanje, Apress, New York.
5. Lazarević, B., 2003, Baze podataka, FON, Beograd.

MANDATORY EQUIPMENT:	Projector, desktop computers, Microsoft SQL Server Express software, Microsoft SQL client software (HeidiSQL)
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Instruction is delivered through lectures, practical laboratory exercises, and project development.

Full course title:		**E-Business**
Course code:		**I4**
Module level (education cycle):		**First cycle**
Year of study:		**II**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Fourth (summer) semester**
Study program:		**Information techniques**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Compulsory**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**3**
Laboratory classes:		**0**

Course objectives:

The objective of the course is to introduce students to the concepts of electronic and mobile business. Students will learn about the role and significance of various forms of electronic business. They will become familiar with the fundamental changes in business processes and organization after the introduction of electronic and mobile business, as well as with the most important systems in electronic business. Additionally, as an extension of E-business, students will be introduced to mobile applications and mobile business.

Learning outcomes:

Upon completing this course, students will be able to:

- recognize the possibilities of modern electronic and mobile business systems
- apply various available software tools and solutions intended for electronic business
- independently use basic electronic business applications
- apply electronic business tools to specific business problems

COURSE CONTENT

- Introduction to electronic business
- Information systems and electronic and mobile business
- Organizational models of electronic business
- Electronic business infrastructure
- CRM systems
- Implementation of electronic business in companies
- E-customer relationships
- Basics of Internet marketing
- E-supply chain
- ERP systems
- Electronic payment systems
- Mobile business
- Mobile application models
- E-services
- Security mechanisms in electronic business

GRADING SYSTEM

PRE-EXAM OBLIGATIONS - In the 6th week of the semester, the first knowledge assessment is conducted through Test 1. - In the 12th week of the semester, the second knowledge assessment is conducted through Test 2. - Throughout the semester, after each exercise session, students submit their completed exercises to the learning management system.	- Test 1: 15 points - Test 2: 15 points - Exercises: 20 points
Final exam The final exam covers the theoretical and practical aspects of applying electronic business.	- Final exam: 50 points
TOTAL	**100**

REQUIRED LITERATURE

1. Radenković, B., Despotović-Zrakić, M., Bogdanović, Z., Barać, D., Labus, A., 2015, Elektronsko poslovanje, Fakultet organizacionih nauka, Beograd.

ADDITIONAL LITERATURE

1. Paavilainen, J., 2007, Mobile Business Strategies: Understanding the Technologies and Opportunities, Wireless Press.
2. Jelassi, T., 2007, Strategies for E-Business: Creating Value Through Electronic and Mobile Commerce, Prentice Hall.

MANDATORY EQUIPMENT:	Computers, projector, internet access
ADDITIONAL EQUIPEMNT:	N/A

METHODS OF CONDUCTING CLASSES

Instruction is conducted through lectures, discussions, and exercises.

Full course title:		**Object-oriented Programming**
Course code:		**R9**
Module level (education cycle):		**First cycle**
Year of study:		**II**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Fourth (summer) semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Compulsory**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**2**
Laboratory classes:		**1**

Course objectives

The objective of the course is to introduce students to the basic principles, techniques, and methodology of object-oriented software development, as well as to teach them the fundamental principles of object-oriented programming. Additionally, students will master the concepts of encapsulation and interfaces, classes and objects, and the basic elements of a class such as methods and attributes, as well as relationships between classes. Students will be trained to use the object-oriented approach for direct program development in a specific object-oriented programming language. An additional objective of the course is to familiarize students with syntax, development environments, and projects.

Learning outcomes:

Upon completing this course, students will be able to:

- use the object-oriented approach for direct program development in a specific object-oriented programming language
- independently apply inheritance and polymorphism to problem-solving, and also use classes and objects in application design
- independently implement operator overloading in class development
- distinguish between structures and classes, as well as interfaces and abstract classes
- independently create and use delegates and events
- create a user interface
- independently develop projects through the development environment.

COURSE CONTENT

- Introduction to object-oriented programming
- Basic concepts of OOP: Class, method (function), property (variable). Private and public access. Encapsulation.
- Brief overview of object-oriented languages C, C#, C++, and JAVA.
- Structuring basic programs. Creating custom and using existing classes along with their methods and properties (attributes).
- System types. Collections and generic containers. Validation of user input on forms.
- Working with projects and project files. Project management. Using resource files.
- File handling.
- Creating and designing user interfaces.
- Model-View-Delegate approach. Directory model. Tree model. File system model.

Delegates. Delegates in table models.

- Events. Signals and slots. Using events and actions through the user interface and through code.
- Serialization. Code Access Security.
- Basics of Interoperability (COM).
- Multithreading. Exception handling.
- Services.
- Drawing on the user interface with tools. Representing various shapes. Animating shapes on the user interface..

GRADING SYSTEM

PRE-EXAM OBLIGATIONS: - Project Assignment: For the areas covered until the middle of the semester, a project assignment is given in the form of creating an application. - Class attendance and participation.	40% 10%
Final Exam: A project (software application) is assigned, which must be completed during the semester, applying the areas covered in the course. The students will orally explain how they arrived at the solution.	50%
TOTAL	**100%**

REQUIRED LITERATURE

1. Weisfeld, M., 2020, Objektno orijentisani način mišljenja (5. Izdanje), CET, Beograd.

ADDITIONAL LITERATURE

1. Booch, G., 1994, Object-oriented Analysis and Design With Applications, 2nd ed., Addison-Wesley, Menlo Park, CA
2. Mayo, J., 2002, C#, Miš, Zagreb.
3. Ezust, A., Ezust, P. 2006, An Introduction to Design Patterns in C++ with Qt, Prentice Hall, Upper Saddle River, NJ.
4. Rischpater, R. 2013, Application Development with Qt Creator, Packt Publishing, Birmingham-Mumbai
5. Summerfield, M., 2011, Advanced Qt Programming, Addison-Wesley,Upper Saddle River, NJ

MANDATORY EQUIPMENT:	Desktop/laptop and projector
ADDITIONAL EQUIPMENT:	Software: C++ Qt Creator development tool

METHODS OF CONDUCTING CLASSES

Instruction is conducted through lectures, exercises, and the development of individual projects..

THIRD YEAR
Compulsory courses

Full course title:		**E-Commerce**
Course code:		**I5**
Module level (education cycle):		**First cycle**
Year of study:		**III**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Fifth (winter) semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Compulsory**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**3**
Laboratory classes:		**0**

Course objectives:

The objective of the course is for students to master the theoretical foundations and technological assumptions of electronic commerce as a factor of business globalization in today's business environment. Additionally, the goal is for students to become familiar with the application of IT in the design and management of e-commerce systems, as well as to master concepts related to electronic commerce, business models, technological foundations, and revenue models of electronic commerce. Students will also become acquainted with the basics of security in electronic commerce.

Learning outcomes:

Upon completing this course, students will be able to:

- identify and apply business models that can be implemented using methods and techniques of electronic commerce
- recognize various revenue models in electronic commerce
- independently design and manage projects for the implementation of electronic sales points
- apply various available software tools and solutions intended for electronic commerce.

COURSE CONTENT

- Innovations brought by scientific and technical progress
- The place of electronic commerce in e-business
- Electronic commerce environment
- Development of electronic commerce
- Technological foundations of electronic commerce
- Business models of electronic commerce
- Revenue models
- Payment systems in electronic commerce
- The International Article Number (EAN) system and innovations based on EPOS technologies
- Digital products and services
- E-commerce site models
- Internet trading

- Marketing in electronic commerce
- Building an e-commerce website
- E-commerce security

GRADING SYSTEM

PRE-EXAMINATION OBLIGATIONS - In the 6th week of the semester, the first test is conducted (test 1). - In the 12th week of the semester, the second test is conducted (test 2). - Throughout the semester, after the practice classes, students submit the completed exercise to the learning management system.	- Test 1: 15 points - Test 2: 15 points - Exercises: 20 points
Final Exam: The final exam involves assessing knowledge in the field of electronic commerce and the essential aspects of applying this method of business.	- Final exam: 50 points
TOTAL	**100**

REQUIRED LITERATURE

1. Bjelić, P., 2012, Globalna elektronska trgovina, Ekonomski fakultet, Beograd.

ADDITIONAL LITERATURE

1. Milosavljević, M., Mišković, V., 2011, Elektronska trgovina, Univerzitet Singidunum, Beograd.
2. Chaffey, D., 2007, E-Bussines and E-Commerce Management, Prentice-Hall, London.
3. Laudon, K.C., Guercio Traver, C., 2004, E-Commerce: Business, Technology, Society, Addison-Wesley, Boston.

MANDATORY EQUIPMENT:	Computers, projector, internet access
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Instruction is delivered through lectures, discussions, and exercises.

Full course title:		**Electronic Banking Payment System**
Course code:		**I6**
Module level (education cycle):		**First cycle**
Year of study:		**III**
ECTS credits:		**6 ECTS**
Duration:		**One semester**
Semester:		**Fifth (winter) semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Compulsory**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**3**
Laboratory classes:		**0**

Course objectives:

The objective of the course is to introduce students to the possibilities of using new information and telecommunication technologies in financial institutions, with a special emphasis on banking applications. Additionally, the goal is for students to clearly understand the advantages and disadvantages of electronic banking, to comprehend electronic payment systems and the concept of electronic money, as well as to become familiar with potential risks associated with electronic banking and the security mechanisms for protection. The final goal is to equip students to manage specific tasks in modern electronic banks and in the operational conditions of electronic financial systems.

Learning outcomes:

Upon completing this course, students will be able to:

- understand the possibilities, advantages, and disadvantages of electronic banking
- comprehend electronic payment systems
- recognize potential risks associated with electronic banking
- identify the possibilities to apply various security mechanisms for protection within electronic financial systems.

COURSE CONTENT

- Concept and development of electronic banking
- Technical and technological foundation of electronic banking
- Key protocols supporting internet banking: HTTP (Hypertext Transfer Protocol)
- SSL (Secure Sockets Layer)
- SWIFT system
- Electronic payment traffic
- Large-scale electronic payment systems
- Electronic money
- Electronic checks
- Electronic payment cards
- ATM systems
- POS systems
- Internet security
- Security mechanisms within electronic banking

- Mobile banking

GRADING SYSTEM

PRE-EXAM OBLIGATIONS: - Every three weeks, knowledge assessment is conducted through exercises on the material covered up to that point. - After 4th week, assessment is conducted through Quiz 1 on the basics, development of e-banking, and key protocols. - After 10th week, assessment is conducted through Quiz 2 on e-money, e-checks, and electronic payment cards. - After 15th week, assessment is conducted through Quiz 3 on ATM and POS systems and mobile banking. - At the middle of the semester, Test 1 is conducted with questions covering half of the course material.	- Exercise 1: 4 points - Exercise 2: 3 points - Exercise 3: 4 points - Exercise 4 4 points - Quiz 1 5 points - Quiz 2 5 points - Quiz 3 5 points - Test 1: 20 points
The final exam covers the entire course of the course.	- Final test 50 points
TOTAL	**100%**

REQUIRED LITERATURE

1. Uroš, T., 2016, Elektronsko bankarstvo, Visoka škola poslovnih studija, Beograd.
2. Vuksanović, E., 2009, Elektronski sistemi plaćanja, Ekonomski fakultet Univerziteta u Kragujevcu, Kragujevac.

ADDITIONAL LITERATURE

1. Radovanović, P., 2009, Elektronsko bankarstvo kao okosnica digitalne ekonomije, Visoka poslovna škola strukovnih studija, Leskovac.
2. Shah, M., Clarke, S., 2009, E-Banking Managment Issues, Solutions, and Strategies, IGI Global, Hershey.
3. Časopisi – preporučuje se korištenje članaka iz ekonomskih časopisa.

MANDATORY EQUIPMENT:	Laptop, projector
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Instruction is conducted through lectures, group work and discussions, exercises, and the creation and presentation of seminar papers.

Full course title:		**Web programming**
Course code:		**R7**
Module level (education cycle):		**First cycle**
Year of study:		**III**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Fifth (winter) semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Compulsory**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**1**
Laboratory classes:		**2**

Course objectives:

The objective of the course is to familiarize students with the elements of web page design and web application development, which includes understanding the HTTP protocol and server technology, as well as the organization and architecture of web applications. Students will cover the main elements that make up the individual components of a comprehensive project solution on a web platform and will explore various technological possibilities that can be applied in specific situations.

Learning outcomes:

Upon completing this course, students will be able to:

- understand the architecture of web applications and internet technologies
- design a dynamic website that meets specific needs and interests
- use structured languages that describe web pages (HTML, CSS)
- use JavaScript to add dynamic content to pages
- use JavaScript to access and utilize web services for dynamic content (AJAX, JSON, etc.)
- understand the PHP programming language on the server side of web applications, using basic syntax
- use PHP classes
- understand databases and connect to a database
- perform basic database operations using SQL commands
- utilize advanced topics for creating web applications.

COURSE CONTENT

- Internet, web, protocols, HTTP protocol
- HTML language – introduction, basic tags
- HTML language – tables, frames, forms
- Cascading Style Sheets (CSS)
- JavaScript – introduction and syntax, basic objects
- JavaScript – built-in objects, event handling, Document Object Model (DOM)
- JavaScript – allowed expressions, AJAX, new trends in web technologies
- PHP language – introduction and syntax, variables, data types, arrays, associative arrays
- PHP language – constants and operators, functions, control structures
- PHP language – OOP design, classes, objects, properties
- PHP language – OOP design, inheritance, final methods, interfaces, abstract methods,

exception generation, and inheritance
- PHP advanced topics – global variables, cookies, sessions
- PHP language – database operations, using directory services, sending email messages
- PHP language – using SQL commands, creating advanced database queries
- Web development, measuring web server load, web engineering

GRADING SYSETM

PRE-EXAM OBLIGATIONS: - After the 6th week of lectures, Test 1 is conducted with questions covering the material taught in the first 6 weeks of lectures (HTML5, CSS3, JavaScript). - In the final week of lectures, Test 2 is conducted with questions covering the material taught between the 8th and 14th weeks of lectures (PHP, MySQL). - In the final week of lectures, after Test 2, the students will present their final projects. Students work in groups of up to 5 members, and the project includes all the technologies covered in the lectures. - Students' participation during lectures and exercises is awarded up to a maximum of 5 points	- Test 1 10 points - Test 2 10 points - Project 25 points. - Participation 5 points
The final exam covers all the material that was taught during the lectures.	50 points
TOTAL	**100 points**

REQUIRED LITERATURE

1. Welling, L.,Thomson, L., 2016, PHP i MySQL: Razvoj aplikacija za veb, Prevod petog izdanja, Mikro knjiga, Beograd.
2. Lemay, l., Colburn, R., Kyrnin, J., 2016, html5, css3 i javascript za razvoj veb strana, Kompjuter biblioteka, Beograd.

ADDITIONAL LITERATURE

1. Prettyman, S., 2016, Object Oriented Modular Programming using HTML5, CSS3, JavaScript, XML, JSON, and MySQL, Apress, NY.

MANDATORY EQUIPMENT:	Computer or laptop
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Instruction is conducted through lectures and exercises.

Full course title:		**Customer Support Technologies and Systems**
Course code:		**I11**
Module level (education cycle):		**First cycle**
Year of study:		**III**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Sixth (summer) semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Compulsory**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**3**
Laboratory classes:		**0**

Course objectives:

The objective of the course is for students to become familiar with the theoretical foundations, technologies, and techniques for providing customer support. Students will master theoretical knowledge about customer support techniques and technologies, as well as practical knowledge needed for organizing customer support and using customer support systems. Students will also acquire the knowledge and skills needed to perform tasks such as diagnosing and resolving issues, successfully communicating with customers, determining the specific needs of end users, and training end users.

Learning outcomes:

Upon completing this course, students will be able to:

- explain the process of establishing a customer support service
- demonstrate the ability to create customer profiles
- describe the organization and necessary human resources for successfully organizing customer support
- prioritize problem-solving tasks
- demonstrate the ability to manage procedures
- demonstrate the process of receiving customer requests
- identify, implement, and review customer support service metrics
- calculate the return on investment for organizing a customer support service
- independently analyze customer issues and lead them to successful resolution
- formulate methods for problem-solving

COURSE CONTENT

- Introduction to computer user support
- Skills required for working in customer support services
- Classification of users
- Service Desk – Roles and responsibilities, processes and procedures, performance measurement
- Customer support systems
- Call centers

- Web-oriented support
- Professional consulting
- Mail service
- Help desk organization
- FAQ
- Tools for enhancing the quality of customer support
- Defining end-user needs
- End-user training
- Customer support as a profession

GRADING SYSTEM

PRE-EXAM OBLIGATIONS: - After each lecture, knowledge is assessed through online quizzes. The total number of quizzes is 13. - In the middle of the semester (8th week), Test 1 is conducted with questions covering the material taught in the first seven weeks of lectures. - Student participation during lectures and exercises is awarded up to a maximum of 5 points.	- Quizzes 1 – 13 (2x13 = 26 points) - Test 1 19 points - Participation 5 points
The final exam covers all the material that was taught during the lectures.	50 points
TOTAL	**100 points**

REQUIRED LITERATURE

1. Knapp, D., 2013, A Guide to Service Desk Concepts, 4th edition, Cengage, Boston.
2. Beisse, F., 2013, A Guide to Computer User Support for Help Desk and Support Specialists, 5th edition, Cengage, Boston.

ADDITIONAL LITERATURE

1. Marcella, R., Middleton, I.A., 1996, Key Factors in Help Desk Success: An Analysis of Areas Critical to Help Desk Development and Functionality, British Library Research and Development Department, London.
2. Walker, G., 2001, IT Problem Management, Prentice-Hall, New Jersey.
3. Časopisi - preporučuje se korištenje članaka iz stučnih časopisa

MANDATORY EQUIPMENT:	Laptop and projector
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Instruction is conducted through lectures, exercises, case study analysis, and the creation and presentation of seminar papers.

Elective courses

Full course title:		**Business Informatics**
Course code:		**I10**
Module level (education cycle):		**First cycle**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Winter Semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Elective**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**2**
Laboratory exercises:		**1**

Course objectives:

The goal of this course is to equip students for the independent use of personal computers in the business field. Additionally, the course aims to provide knowledge in the areas of the internet and internet technologies, as well as familiarizing students with internet services, methods of finding information on the internet, and the necessary infrastructure. Various aspects of the application of computers in the optimization of business processes and the implementation of electronic business systems will be highlighted. On a pragmatic level, the course will ensure the ability to apply computers in solving business tasks.

Learning outcomes:

Upon completion of this course, students will be able to:

- improve business decision-making processes with the use of information technology;
- recognize the importance and possibilities of modern software tools in business;
- identify available software tools and solutions designed to solve business problems;
- independently use basic internet services and software tools used in the business environment.

COURSE CONTENT

- Informatics as a theoretical and practical discipline
- Business Informatics and Organization
- The concept and elements of the information system
- Functions of the information system
- A computer as part of an information system
- Methods to display processing results
- The Concept of Internet Communication
- The emergence and development of the Internet
- Web Search
- Application of information systems in the business environment
- E-commerce
- Internet marketing
- Fundamentals of e-banking
- Fundamentals of Mobile Business

- Introduction to Information System Protection

GRADING SYSTEM

PRE-EXAM OBLIGATIONS - In the 6th week of the semester, the first test is carried out - In the 12th week of the semester, the second test is carried out - Throughout the semester, after the practice classes, students submit the completed exercise to the learning management system.	- Test 1: 15 points - Test 2: 15 points - Exercises: 20 points
Final exam The final exam includes a theoretical and practical part. The theoretical part refers to all important aspects of computer science in modern business. The practical part of the exam includes a practical test of students' knowledge and skills on computers.	- Final exam: 50 points (theoretical part 25 points and practical part 25 points)
TOTAL	**100**

REQUIRED LITERATURE

1 Panian, Ž., Strugar, I., 2013, Informatizacija poslovanja, Ekonomski fakultet, Zagreb.

ADDITIONAL LITERATURE

1 Milosavljević, M., Veinović, M., Grubor, G., 2013, Informatika, Univerzitet Singidunum, Beograd.
2 Bosilj Vukšić, V. et al., 2012, Poslovna informatika, Element, Zagreb.
3 Glushko, R. J., McGrath, T., 2005, Document Engineering, The MIT Press, Boston.
4 Rainer, R. K. Jr., Turban, E., Potter, R. E., 2006, Introduction to Information Systems: Supporting and Transforming Business, Wiley, Hoboken.
1. Panian, Ž., 2005, Poslovna informatika za ekonomiste, Masmedia, Zagreb.

MANDATORY EQUIPMENT:	Computers, projector, Internet access
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Instruction is delivered through lectures, discussions, exercises.

Full course title:		**Fundamentals of Economics**
Course code:		**BOF8**
Module level (education cycle):		**First cycle**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Winter Semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Elective**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**3**
Laboratory exercises:		**0**

Course objectives:

The aim of this course is for students to acquire basic knowledge about economic phenomena and processes, as well as the nature and laws of behavior of economic subjects in the conditions prevailing on the market. In addition, the issues of the use of limited resources, the functioning of the market, the role of supply and demand, key decisions on production and prices in different market structures are also discussed. In each of these issues, the emphasis is on the application of basic economic principles in the conditions of an entrepreneurial economy.

Learning outcomes:

Upon completion of this course, students will be able to:

- define and explain the basic economic concepts.
- understand the concept of resource scarcity and how different economic systems provide answers to fundamental economic issues in their own way.
- understand how the market mechanism works, graphically depict the movement of the supply and demand curve in relation to the determinants that act on market supply and demand;
- understand and explain consumer behaviour, utility, marginal utility theory and the indifference curve;
- explain key production and price decisions in different market structures;
- analyze the movement of basic macroeconomic indicators, understand the causes and consequences of growth, unemployment, inflation and GDP decline;
- independently detect the causes of economic success and failure.

COURSE CONTENT

- The concept and definition of economics, the concept of scarcity of resources
- Development of economics as a science, leading school of economics
- Economic Systems and the Modern Economy
- Market mechanism, demand, law of demand, determinants of demand, demand curve, substitution effect and income effect, change in demand, supply, determinants of supply, supply curve, change in supply, market equilibrium
- Elasticity of supply and demand, elements that determine elasticity
- Economies of scale, the existence of economies of scale on the supply side, economies of scale on the demand side

- Costs – fixed, variable and marginal, the impact of ICT on costs
- Theory of marginal utility, indifference curve
- Volume of production and turnover of capital, cost of production
- Profit, profit rate and capital accumulation
- Income distribution and factor of production prices
- Imperfect competition and the problem of monopolies, oligopoly and monopolistic competition.
- Basic macroeconomic aggregates
- Economic development
- The Digital Transformation of the Economy
- Fundamentals of Behavioral Economics

GRADING SYSTEM

PRE-EXAM OBLIGATIONS - Student participation implies an active relationship in lectures and exercises - In the middle of the semester, test 1 is held with questions based on material covered up to that week - In the 13th week of the lecture, test 2 is held, which includes tasks from the percentage calculus and elasticity of supply and demand	- Student participation 5 points - Test 1: 25 points - Test 2 20 points
The final exam includes theoretical aspects of basic economic phenomena and processes, as well as the laws of behavior of economic subjects.	Final exam 50 points
TOTAL	**100 points**

REQUIRED LITERATURE

1 Hodžić, K., Džafić, Z., Ćevjanović, F., 2012, Osnove ekonomije, Ekonomski fakultet u Tuzli, Tuzla.

2 Samuelson, P. A., Nordhaus, W. D., 2005, Ekonomija, 18. izdanje, Mate, Zagreb.

ADDITIONAL LITERATURE

1 Kurtović, S., 2008, Principi ekonomije, Grafičar, Užice.

2 Benić, Đ., 2004, Osnove ekonomije, 4. izdanje, Školska knjiga, Zagreb.

3 Ferenčak, I., 2003, Počela ekonomike, 2. izdanje, Ekonomski faklutet u Osijeku, Osijek.

4 Huerta de Soto, J., 2022, Austrijska škola: tržišni poredak i preduzetnička kreativnost, Centar za javne politike i ekonomske analize Zenica.

1. Časopisi - preporučuje se korištenje članaka iz ekonomskih časopisa.

MANDATORY EQUIPMENT:	Laptop, Projector
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Instruction is delivered through lectures, exercises and discussions on cases from practice.

Full course title:		**Business communication**
Course code:		**TK1**
Module level (education cycle):		**First cycle**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Winter Semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Elective**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**3**
Laboratory exercises:		**0**

Course objectives:

The aim of the course is to acquire the general knowledge necessary for more successful interpersonal communication in the business environment and to effectively shape messages in public and written communication, as well as when presenting information. Additional objectives of this course are to acquire the skills of writing business letters in the field of sales, procurement and press releases and to master electronically mediated business communication.

Learning outcomes:

Upon completion of this course, students will be able to:

- successfully use interpersonal communication in a business environment.
- effectively shape messages in public and written communication and presentation;
- independently formulate press releases, business letters in the field of sales and procurement;
- successfully write letters of recommendation and requests for recommendation;
- use electronically mediated business communication.

CONTENTS OF THE COURSE

- Introduction to Business Communications
- Verbal and nonverbal communication in the business environment
- CV and cover letter
- Application of the model of interpersonal communication competence in business communication
- Business communication skills
- Presentation communication
- Sales communication
- Business meetings and negotiation
- Business interview
- Written communication
- Introduction by letter
- Letter of recommendation
- Electronically mediated business communication
- Writing a press release
- Examples from practice

GRADING SYSTEM

PRE-EXAM OBLIGATIONS	**50%**

- 5 points – Attendance - 5 points – Participation - 40 points – Practical work: 5 points - CV/PP 20 points - Presentation 15 points - Exercise (1,2,3,4,5.)	
The final exam includes theoretical aspects, the acquisition of general knowledge about interpersonal communication in the business environment and the effective shaping of messages in public and written communication.	**50%**
TOTAL	**100%**

REQUIRED LITERATURE

1 Bovee, C. L., Thill, J. V., 2012, Suvremena poslovna komunikacija, 10. izdanje, Mate, Zagreb.

ADDITIONAL LITERATURE

1 Fox, R., 2006, Poslovna komunikacija, 2. izdanje, Hrvatska sveucilišna naklada – Pučko Otvoreno Uciliste, Zagreb.

2 Vodopija, Š., 2006, Opća i poslovna komunikacija, Naklada Žagar, Rijeka.

3 Rouse, M. J., Rouse, S., 2005, Poslovne komunikacije: kulturološki i strateški pristup, Masmedia, Zagreb.

1. Časopisi - preporučuje se korištenje članaka iz ekonomskih časopisa.

MANDATORY EQUIPMENT:	Laptop, Projector
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Instruction is delivered through lectures, exercises, analysis of business cases and writing business letters.

Full course title:		**Computer Graphics and Animation**
Course code:		**M7**
Module level (education cycle):		**First cycle**
Year of study:		**6**
ECTS credits:		**One semester**
Duration:		**Winter Semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Elective**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**2**
Laboratory exercises:		**1**

Course objectives:

Enabling students to develop and manipulate computer graphics elements in the plane and space is one of the goals of this course. Additional goals are to introduce students to the concept of digital graphics, in the broadest sense and understanding of its scope and content, as well as the importance and applicability in the field of visual communications, while referring to the most diverse areas of contemporary design and marketing. The objectives of the course are to introduce students to the concept of visual communications, as well as the most famous modern digital tools and approaches, formats, vocabulary and basic elements that they will master, all through the research of the digital image as a means of communication.

Learning outcomes:

Upon completion of this course, students will be able to:

- understand and explain the concept of computer graphics from all aspects of modern design and its diverse applications;
- analyze and evaluate the quality of work in this field.
- apply the most well-known digital tools;
- use and build this knowledge in future courses, as well as in future practice.

COURSE CONTENT:

- Introduction to computer graphics
- Graphic hardware and software
- Concept of computer graphics
- Creating and storing models and images
- Use of models and images in computer graphics
- Prevalence and use of computer graphics
- Examples of computer graphics applications
- Visual communications
- Basics of 3D modeling
- Interactive graphics
- Raster graphics: quality, types, formats, and storage
- Vector graphics: quality, types, formats, and storage
- Computer animation
- Editing of animation, video, and sound
- Integration with other teaching disciplines

GRADING SYSTEM

PRE-EXAM OBLIGATIONS - During the semester, it is necessary to create a group (or individual) seminar paper in which a specific area of interest from the literature (written part) is covered in detail, in the form of lectures. - Defense of the seminar paper in the form of a lecture for all students from the group. - Exercises – development of the visual identity of a graphic project using vector graphics tools (Corel draw, Adobe Illustrator and AutoCAD) and presentation of it.	15 points 10 points 25 points
Final exam	50 points
TOTAL	**100**

REQUIRED LITERATURE

1. Lemeš, S., 2017, Računarska grafika i geometrijsko modeliranje, Politehnički fakultet Univerziteta u Zenici.

ADDITIONAL LITERATURE

1. Egić, V., Gambiriroža, D., 2005, Corel Draw, PC knjiga.
2. Ilić, S., 2017, Osnove AutoCAD-a, Mikro knjiga.
3. Abbot, D., 2008, AutoCAD – tajne koje bi trebao znati svaki korisnik, Kompjuter blioteka.
4. Grupa autora, 2016, Adobe Illustrator CS 6 – Učionica u knjizi, Mikro knjiga.

MANDATORY EQUIPMENT:	Computer, projector
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Classes are conducted auditorily with the use of a projector, and in combination with laboratory exercises using computer equipment, through parallel student work during lectures and independent work during exercises..

Full course title:		**Applied Financial Management**
Course code:		**BOF10**
Module level (education cycle):		**First cycle**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Winter Semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Elective**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**3**
Laboratory exercises:		**0**

Course objectives:

The aim of the course is for students to master the basic knowledge related to the understanding of the financial operations of companies, with special emphasis on knowledge that can be directly implemented in the real business world. Additional objectives of the course are to introduce students to the process of financial management, techniques of fundraising and allocation, methods of financial analysis, risk analysis and assessment, methods of company valuation and other methods and techniques of financial management, which should enable them to make independent financial decisions in business practice.

Learning outcomes:

Upon completion of this course, students will be able to:

- understand the relationship between the financial function and other functions in the company.
- actively use financial instruments and techniques in the process of managing the company's finances;
- understand the financial, legal and business environment.
- understand the concept of the time value of money and methods of valuing the profitability of capital investments;
- interpret financial data and conduct a simple financial analysis of the business entity;
- know the standard and specific forms of the company financing;
- independently make financial decisions in their own business.

COURSE CONTENT

- The position, role and functioning of the financial system
- Financial management, objectives, purpose and role, nature, area of research, relationship with other financial disciplines, problem of multiple participants in financial management
- Finance of the enterprise, business functions of the enterprise, the relationship between the financial function and other business functions
- Business and tax environment of financial management, money market, capital market, financial intermediaries
- Risk, interest and cost of capital
- Analysis of financial statements
- Time value of money, concepts of securities valuation, valuation of bonds and stocks, calculation of the rate of return
- Financing the company, determining the financing structure and making a financing decision. Capital budgeting.
- Business and financial leverage, total leverage and total risk of the company, coverage

relationships, net operating profit approach vs. traditional approach, Modigliani and Miller theory of capital structure, cost of bankruptcy, agency costs

- Working capital management, the concept and importance of working capital management, optimal level and financing of current assets
- Management of cash and marketable securities (motives for holding cash, selection of marketable securities, money market instruments), management of receivables from customers, assessment of the creditworthiness of debtors, lending and collection policies
- Inventory management (ABC method, EOQ method, JIT)
- Short-term financing (spontaneous, contractual, self-financing, loans, specific sources of financing)
- Procedure for assessing the profitability of capital investments, payback period, discounted payback period, IRR, NPV, PI, difficulties in choosing an investment
- Dividends and dividend policy

GRADING SYSTEM

PRE-EXAM OBLIGATIONS - Students' participation implies an active participation in lectures and exercises. - In the middle of the semester, Test 1 is held with questions encompass half of the teaching material covered - In the 13th week of the lecture, Test 2 is administered, which includes tasks in the analysis of financial statements and the time value of money.	- Participation 5 points - Test 1: 25 points - Test 2 20 points
The final exam covers theoretical aspects of basic knowledge about the financial operations of the company, the process of managing the company's finances, financial analysis, methods of company valuation and financial management techniques.	Final exam 50 points
TOTAL	**100 points**

REQUIRED LITERATURE

1. Van Horne, J. C., Wachowicz Jr., J. M., 2014, Osnove financijskog menadžmenta, 13. izdanje, Mate, Zagreb.
2. Omerhodžić, S., 2012, Primjenjeni finansijski menadžment, Harfo-graf, Tuzla.

ADDITIONAL LITERATURE

1 Zaimović, A., Alibegović, Dž., 2010, Primjena finansijskog menadžmenta - zbirka zadataka sa teorijskim objašnjenjima, Ekonomski fakultet u Sarajevu, Sarajevo.

2 Rovčanin, A., 2010, Upravljanje finansijama, 5. dopunjeno izdanje, Ekonomski fakultet u Sarajevu, Sarajevo.

3 Komnenić, B., 2008, Finansijski menadžment, Visoka poslovna škola strukovnih studija, Novi Sad.

4 Mikerević, D., 2005, Finansijski menadžment, Ekonomski fakultet Banja Luka i Finrar, Banja Luka.

1. Časopisi - preporučuje se korištenje članaka iz ekonomskih časopisa.

MANDATORY EQUIPMENT:	Laptop, Projector
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Classes are conducted through lectures, exercises and discussions on cases from practice.

Full course title:	**Fundamentals of Marketing and Internet Marketing**
Course code:	**I3**
Module level (education cycle):	**First cycle**
ECTS credits:	**6**

Duration:		**One semester**
Semester:		**Winter semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Elective**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**3**
Laboratory exercises:		**0**

Course objectives:

The aim of the course is to acquire basic knowledge, both theoretical and practical, in the field of marketing. In addition, the goal is to introduce students to the possibilities of applying the Internet in marketing, with an emphasis on marketing communications, with the content and specifics of traditional instruments of the marketing mix, and new possibilities, techniques and tools enabled by Internet marketing. Students will understand the essential basics of using marketing as a business concept (marketing, information system and market segmentation). An additional goal of the course is to educate students to apply modern marketing skills and tools in solving problems that arise in business practice.

Learning outcomes:

Upon completion of this course, students will be able to:

- use modern marketing skills and tools in solving problems that are common in business practice;
- identify the possibilities of applying marketing and internet marketing within business systems;
- identify and apply internet marketing techniques and strategies;
- independently demonstrate the implementation of a marketing plan on concrete examples.

COURSE CONTENT

- The concept and definition of marketing
- Marketing environment and internet environment
- Market research
- Segmentation, positioning and forecasting
- Consumer behavior
- The elements of a marketing mix
- Marketing organization
- Internet marketing techniques
- Social media in internet marketing
- E-marketing information systems
- Features and benefits of e-products
- New marketing mix strategies for e-marketplaces
- Mobile Marketing
- Competitive, global and social aspects of marketing
- International Marketing

GRADING SYSTEM

PRE-EXAM OBLIGATIONS - After the 2nd week of lectures,	- Seminar paper 20 points.

students choose a topic for the preparation of a seminar paper, which they need to submit and if they want to achieve the maximum number of points, then present it by the end of the semester. - During the exercises, students do an analysis of the marketing mix of the product/service, which they need to submit by the end of the semester in writing. - After more than half of the scheduled lectures have been held, a test is organized with questions that cover half of the material covered.	- Assignment (analysis of the marketing mix of product/service) 5 points. - Test 25 points.
The final exam includes basic marketing concepts, marketing mix, concepts within Internet marketing, as well as other, selected topics from modern marketing.	- Final exam 50 points.
TOTAL	**100 points**

REQUIRED LITERATURE

1 Ružić, D., Biloš, A., Turkalj, D., 2014, E-marketing, III. izmijenjeno i prošireno izdanje, Sveučilište Josipa Jurja Strossmayera u Osijeku, Ekonomski fakultet u Osijeku.
2 Kotler, P., Wong, V., Saunders, J., Armstrong, G., 2006, Osnove marketinga – četvrto europsko izdanje, Mate, Zagreb.

ADDITIONAL LITERATURE

1 Kotler, P., Keller, K., 2008, Upravljanje marketingom, 12. izdanje, Mate, Zagreb.
2 Strauss, J., El-Ansary, A., Frost, R., 2003, E-marketing, 3rd ed., Prentice Hall.
1. Jobber, D., Fahy, J., 2006, Osnovi marketinga, Data Status, Beograd.

MANDATORY EQUIPMENT:	Laptop, Projector
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Classes are conducted through lectures, discussions, exercises.

Full course title:	**Direct marketing**
Course code:	**TK9**
Module level (education cycle):	**First cycle**

ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Winter Semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Elective**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**3**
Laboratory exercises:		**0**

Course objectives:

The aim of the course is to enable students to multidisciplinary identify the impact of direct marketing activities on the creation of competitive advantage and the consolidation of business authority. In addition, the goal is to introduce students to the goals and functions of direct marketing, as well as the planning and implementation of creative direct marketing strategies in order to build a competitive position. Students will be introduced to personalized aspects of promotional campaigns and trained to manage direct marketing activities aimed at a loyal customer base. An additional goal is to identify the differences among individual direct marketing techniques and to understand the importance and application of databases in direct marketing.

Learning outcomes:

Upon completion of this course, students will be able to:

- identify the impact of direct marketing activities on the creation of competitive advantage;
- understand the goals and functions of direct marketing.
- plan direct marketing activities.
- independently create and implement creative direct marketing strategies;
- differentiate certain direct marketing techniques;
- create a database of potential and existing customers.

COURSE CONTENT

- Business marketing communication
- The concept and role of direct marketing
- Direct marketing as an integrated marketing tool
- Goals and functions of direct marketing
- Direct marketing planning process
- Creative direct marketing strategy
- Direct marketing strategies
- Direct marketing techniques
- Databases as a key resource of direct marketing: database marketing
- Direct marketing channels: e-mail marketing
- Direct marketing channels: catalog marketing
- Direct marketing channels: telephone marketing
- Direct marketing channels: direct response marketing in print media
- Direct marketing channels: direct response marketing in electronic media
- Direct marketing channels: e-commerce

GRADING SYSTEM

PRE-EXAM OBLIGATIONS - After each lecture, the practical application of direct marketing tools is practiced through assignments. - Creating a direct marketing plan – independent work of students. - After the 7th week, the basic strategies of direct marketing are tested through TEST I. - In the last week of the semester, the knowledge of the application of databases in direct marketing is tested through TEST II.	- Work tasks 10 points - Sales plan 20 points - Test I 10 points - Test II 10 points
The final exam covers the theoretical and practical aspects of the application of direct marketing.	Final exam 50 points
TOTAL	**100**

REQUIRED LITERATURE

1 Chroneos Krasavac, B., Veljković, S., 2015, Direktni marketing, CID Beograd, Beograd.

ADDITIONAL LITERATURE

1 Kotler, P., Keller, K., L., Martinović, M., 2014, Upravljanje marketingom, 14. izdanje, Mate
   a. Zagreb.
2 Kotler, P., Keller, K., L., 2006, Marketing menadžment, 12. izdanje, Data status, Beograd.
3 Salai, S., Končar, J., 2007, Direktni marketing, Ekonomski fakultet Subotica, Subotica.
4 Brkić, N., 2003, Upravljanje marketing komuniciranjem, Ekonomski fakultet u Sarajevu, Univerzitet u Sarajevu, Sarajevo.
5 Houdsen, M., Thomas, B., 2002, Direct marketing in practise, The Chatered Institute of Marketing.

1. Časopisi - preporučuje se korištenje članaka iz stučnih časopisa

MANDATORY EQUIPMENT:	Laptop, Projector
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Instruction is delivered through lectures, exercises, analysis of business cases and the creation of seminar papers.

Full course title:		**Web design**
Course code:		**M6**
Module level (education cycle):		**First cycle**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Winter Semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Elective**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**2**
Laboratory exercises:		**1**

Course objectives:

The aim of the course is to introduce students to the basic elements of website design, as well as to the basic methods and techniques of developing simple or moderately complex websites. The aim is to enable students to create and maintain websites on their own, through the knowledge of current, standard web programming languages. The goal is for students to acquire both technical and artistic skills, so that they can design functional, interesting and visually pleasurable websites.

Learning outcomes:

Upon completion of this course, students will be able to:

- master standard web programming languages.
- independently create a website using the latest web technologies;
- maintain the website;
- use their knowledge and skills to create more complex web applications.

COURSE CONTENT

- Introduction to the Internet
- The basic concepts of the web
- Elements and principles of web design
- HTML - elements, attributes, formation
- HTML - block and inline elements, lists
- HTML - Shape
- Cascading Document Formatting Format (CSS)
- Website design
- Author's tools
- Responsive design
- Bootstrap
- Concept and content
- JavaScript - introduction and syntax
- JavaScript - selection, basic methods
- JavaScript Functions

GRADING SYSTEM

PRE-EXAM OBLIGATIONS - Mockup - Creating a project - Website	- 25% - 25%
Final exam	50%
TOTAL	**100%**

REQUIRED LITERATURE

1. Gauchat, J. D., 2014, HTML5, CSS3 i JavaScript: Integrisane tehnologije za izradu veb strana, Mikro knjiga, Beograd.
2. Niederst Robbins, J., 2014, Naučite veb dizajn, prevod 4. izdanja: Vodič kroz HTML, CSS, JavaScript i veb grafiku, Mikro knjiga, Beograd.
3. Hong, F., 2018, Practical web design, Mikro knjiga, Beograd.

ADDITIONAL LITERATURE

1. Duckett, J., 2014, HTML and CSS: Design and Build Websites 1st Edition, Wiley, NY.

MANDATORY EQUIPMENT:	Computer
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Classes are conducted through lectures and laboratory exercises.

Full course title:		**Project Management**
Course code:		**MIB6**
Module level (education cycle):		**First cycle**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Winter Semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Elective**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**3**
Laboratory exercises:		**0**

Course objectives:

The goal is for students to acquire and adopt basic knowledge in the theory of management of various projects in the field of economic and technological development, especially bearing in mind the scientifically based and practically applied concept of project management. In addition, acquiring specific knowledge, methods and techniques necessary for successful project management, mastering the skills of planning, realization and conclusion of a project are additional goals of the course.

Learning outcomes:

Upon completion of this course, students will be able to:

- understand the concept of project management.
- manage a variety of projects;
- participate in the preparation of a project study;
- identify the risks;
- analyze and model the risk of realization;
- define a plan for the implementation of the project;
- actively use modern project management tools.

COURSE CONTENT

- Project, project types, project characteristics, programs and subprojects
- The concept of project management
- Project management organization
- Project management processes
- Managing the integration and scope of the project
- Project time management
- Project management methods and techniques
- Project cost management
- Quality management on the project
- Project human resource management
- Project communication and conflict management
- Project risk management
- Project procurement and contracting management
- Evaluation, reporting and completion of the project

- The main reasons for the failure and success of the project

GRADING SYSTEM

PRE-EXAM OBLIGATIONS	**Participation and attendance** (The participation of students during lectures and exercises is scored through individual and team work in the preparation of tasks, focus groups, simulations, etc., and through inquiries, discussions and conversations in e-mail communication and during consultations.)	**5 points**
	Project (Students' theoretical and practical knowledge in the part of project development through predefined Excel and Word formats and their knowledge of the elements of the logical matrix, Gantt charts, budgets and other parts necessary for the development of project proposals are scored.)	**25 points**
	Test 1 (Covers 50% of the planned course content and includes tasks related to the formation of network diagrams and the determination of the critical path (CPM) of projects.)	**20 points**
FINAL TEST	**Final exam** (Covers all planned course content and includes tasks related to the formation of network diagrams and the determination of the critical path (CPM) of projects.)	**50 points**
TOTAL		**100 points**

REQUIRED LITERATURE

1 Majstorović, V., 2010, Projektni menadžment, Sveučilište u Mostaru, Mostar.
2 Hauc, A. 2007, Projektni menadžment i projektno poslovanje, MEP, Zagreb.
3 Europska komisija, 2008, Smjernice za upravljanje projektnim ciklusom, Zagreb.

ADDITIONAL LITERATURE

1 Avlijaš, R. 2011, Upravljanje projektom, Univerzitet Singidunum, Beograd.
2 Jovanović, P. 2010, Upravljanje projektom, Visoka škola za projektni menadžment, Beograd.
3 Avlijaš, R. 2009, Upravljanje rizikom na projektu, Univerzitet Singidunum, Beograd.
4 Lock, D., 2007, Project Management, 9th ed., Gower, Aldershot.
1. Tim TRI/Građanske inicijative, 2003, Pristup putem logičkog okvira (LFA) - Priručnik za planiranje usmereno na ciljeve, Beograd.

MANDATORY EQUIPMENT:	Laptop & Projector
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Classes are carried out through lectures, exercises, project analysis and the development and presentation of project proposals.

Full course title:		**Statistics and research methods**
Course code:		**MIB1**
Module level (education cycle):		**First cycle**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Winter Semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Elective**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**3**
Laboratory exercises:		**0**

Course Objectives:

The aim of this course is to introduce students to the use of research methods and applied statistical analysis methods. Additional objectives include students mastering the basic methods and techniques of data collection, understanding the logic of sampling, and various statistical analyses. Furthermore, the goal is for them to recognize the basic logic of drawing conclusions in empirical research.

Learning outcomes:

Upon completion of this course, students will be able to:

- master basic methods and techniques of data collection;
- understand the logic of sampling;
- identify, describe, and understand different levels of measurement and associated statistical analyses;
- apply statistical methods in research work;
- use computer programs (MS EXCEL, SPSS) to apply basic statistical techniques and methods in grouping, tabular and graphical presentation, analysis, and interpretation of statistical data;
- solve statistical problems using appropriate software

COURSE CONTENTS

- Concept and subject of statistics
- Graphic techniques - organizing and visualizing data
- Descriptive statistics
- Probability
- Random variables and probability distributions
- Sampling
- Statistical inference
- Hypothesis testing
- Regression analyzes
- Research problem and research design
- Identification and types of variables
- Data collection methods
- Sample selection

- Displaying and analyzing data
- Statistical computer programs

GRADING SYSTEM

PRE-EXAM OBLIGATIONS - In the 8th week of the semester, the first test is carried out - Preparation of a research paper during the semester consisting of 3 parts: theoretical part (10 points), empirical part (10 points) and presentation (10 points)	- Test 1: 20 points - Research paper: 30 points
Final exam	50 points
TOTAL	**100**

REQUIRED LITERATURE

1. Fazlović, S., 2013, Primijenjena statistika, OFF – SET, Tuzla.

ADDITIONAL LITERATURE

1. Zahirović, S., Okičić, J., 2021, Primijenjena multivarijatna analiza, OFF-SET, Tuzla
2. Somun-Kapetanović, R., 2014, Statistika u ekonomiji i menadžmentu, Ekonomski fakultet u Sarajevu, Sarajevo.
3. Kukić, S., Markić, B., 2006, Metodologija društvenih znanosti, Ekonomski fakultet Mostar, Mostar.
4. Papić., M., 2005, Primijenjena statistika u MS Excelu, Naklada Zoro, Zagreb.
5. Levine, D. M., Stephan, D., & Szabat, K., 2021, Statistics for Managers Using Microsoft Excel, 9th edition, Pearson.
1. Kumar, R., 2011, Research Methodology: A Step-by-Step Guide for Beginners, SAGE.

MANDATORY EQUIPMENT:	Laptop, Projector
ADDITIONAL EQUIPMENT:	SPSS software

METHODS OF CONDUCTING CLASSES

Instruction is delivered through lectures, exercises, analysis of business cases and the creation of research papers.

Full course title:		**Multimedia technologies**
Course code:		**M3**
Module level (education cycle):		**First cycle**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Summer semester**
Study program:		**Informational Technologies**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Elective**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**2**
Laboratory exercises:		**1**

Course objectives:

The aim of the course is to provide students with basic knowledge about multimedia technologies, devices and systems, and to introduce students to the principles of working, analyzing and interpreting multimedia (taxonomy), the way of creating, displaying and processing media (text, hypertext, graphics, sound, video and animation). Students will learn to meaningfully and aesthetically connect media into a complete application of the desired properties in the application. They will learn about the methods, techniques and tools by which media are developed and then connected into multimedia applications.

Learning outcomes:

Upon completion of this course, students will be able to:

- gain theoretical knowledge and practical competencies for the application of multimedia and interactive technologies in practice;
- understand the capabilities of modern software tools for media development;
- apply basic techniques for the development of multimedia;
- use various available software tools and solutions intended for the development of multimedia elements;
- independently use basic multimedia software tools and interactive technologies.

COURSE CONTENT

- Introduction to Multimedia
- Features of multimedia systems
- Audio basics
- Image basics
- Text
- Animation basics
- Video basics
- Visual effects
- Audio-visual integration
- Multimedia data acquisition
- Standards in multimedia communications
- Preparation of multimedia materials
- The applied aspect of multimedia
- Multimedia application software

Directions for the development of multimedia

GRADING SYSTEM

PRE-EXAM OBLIGATIONS - Partial test (implemented in the middle of the lecture) - Independent project (implemented during the exercises and presented before the final exam) - Participation (lectures and exercises)	10 points 35 points 5 points
Final exam	50 points
TOTAL	**100 points**

REQUIRED LITERATURE

1 Starčević, D., Štavljanin, V., 2013, Multimedia, Faculty of Organizational Sciences, Belgrade.

ADDITIONAL LITERATURE

1 Bojković, Z., Martinović, D., 2011, Fundamentals of Multimedia Technologies, College of Electrical Engineering and Computer Science of Applied Studies, Belgrade.

2 Cvetković, D., Marković, D., Savanović, N., 2015, Multimedia, Singidunum University, Belgrade.

3 Chapman, N., Chapman, J., 2009, Digital multimedia, 3rd ed., John Wiley and Sons, Chicester.

4 Vaughan, V., 2008, Multimedia Making it Work, 7th ed., McGraw-Hill, New York.

1. Li, Z., Drew, M.S., 2004, Fundamantals of Multimedia, Pearson Education, Upper Saddle River.

MANDATORY EQUIPMENT:	Computers, projector, Internet access
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Classes are conducted through lectures, discussions, exercises.

Full course title:		**Management**
Course code:		**MIB3**
Module level (education cycle):		**First cycle**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Summer semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Elective**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**3**
Laboratory exercises:		**0**

Course objectives:

The aim of this course is for students to acquire basic skills related to structuring an organization, managing an organizational structure, as well as understanding basic managerial processes. Additional objectives of the course are to introduce students to the importance and goals of human resource management, and to identify the differences between the traditional and modern organizational structure of the company.

Learning outcomes:

Upon completion of this course, students will be able to:

- analyze the factors of the company and their conditionality;
- choose the most favorable organizational structure of the company;
- analyze the processes in the company;
- distinguish between the traditional and modern organizational structure of the enterprise;
- solve specific organizational problems.
- manage parts of the company and the company as a whole.

COURSE CONTENT

- The nature and significance of management and organization
- Principles of Management and Organization
- Managerial roles
- Types of organizational structures
- Theories of organization
- Organization of business functions and workplaces
- Basic flows in the enterprise
- Contemporary trends in the formation of an organization
- Shaping the company's communication system
- Enterprise Management Processes
- Methods and techniques of enterprise management
- Communication and negotiation in the framework of leadership – concept, elements, types and barriers
- Motivation in the framework of leadership – concept, types, significance and approaches
- Groups and teams – characteristics, types and development
- Leadership, leaders, and styles

GRADING SYSTEM

PRE-EXAM OBLIGATIONS	**Activity and attendance** (The activity of students during lectures and exercises is scored through individual and team work in the creation of tasks, focus groups, simulation of business cases, role-playing games, etc., and through inquiries, discussions and conversations in e-mail communication and during consultations.)	**5%**
	Management plan - development and presentation (Students are credited with theoretical and practical knowledge in the part of developing management plans through predefined Word formats and their knowledge of managerial functions, techniques, skills and instruments, especially the topics: SWOT analysis, vision and mission, strategic and operational goals, outcomes and indicators, actions aimed at achieving goals, organizational structure for the realization of goals, action and operational plan, dynamics of implementation, human resources plan, recruitment and selection, control, monitoring and corrective actions)	**25%**
	Test 1 (Covers 50% of the planned course content.)	**20%**
FINAL TEST	**Final Exam** (Includes all planned subject content.)	**50%**
	TOTAL	**100%**

REQUIRED LITERATURE

1 Petković, M., et al., 2014, Organization, 11th ed., Center for Publishing Activities, Faculty of Economics, Belgrade, Belgrade.
2 Schema, Dž., Rahimić, Z., 2009, Menadžment, Ökonomie fakultet u Sarajevu.

ADDITIONAL LITERATURE

1 Mašić, B., 2010, Management, Singidunum University, Belgrade.
2 Zelenović, D., 2009, Technology of Organization of Industrial Systems-Enterprises, Faculty of Technical Sciences, Novi Sad.
3 Kurtić, A., 2005, Business Organization (Basics, Theories, Structures, Dynamics), OFF-SET, Tuzla.
4 Weihrich H., Koontz H., 1999, Menadžment, Mate, Zagreb.
5 Schema, Dž., Rahimić, Z., 2009, Menadžment, Ökonomie fakultet u Sarajevu.
1. Journals - it is recommended to use articles from professional journals.

MANDATORY EQUIPMENT:	Laptop & Projector
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Classes are conducted through lectures, exercises, analysis of business cases and the development and presentation of a management plan.

Full course title:		**Digital photography**
Course code:		**M5**
Module level (education cycle):		**First cycle**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Summer semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Elective**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**2**
Laboratory exercises:		**1**

Course objectives:

The aim of the course is for students to acquire basic knowledge about photography as a medium and form of expression. In addition, the goal is for students to learn to frame with regard to composition, light source, environment and other working conditions through practical exercises, and to acquire knowledge of digital photography, the application of Photoshop and digital processing of photography. Students will also learn how to convey information or message given by the photo frame, that is, how to analyze a photo and critically determine their content, composition, etc.

Learning outcomes:

Upon completion of this course, students will be able to:

- independently convey information or message given by the frame of the photograph, analyze the photograph and critically determine its content and composition;
- recognize and assess the value of a photographic work, in particular as a means of communication or a tool of market communication;
- independently assess the quality of the photographic work, and the possibilities of its use for the purpose for which it was made;
- independently create photos for different needs, using both the most modern and traditional methods of shooting;
- independently and in a group, realize the setting and all other forms of presentation of a photographic work or a group of works, in the form of an exhibition, printed materials, projections or presentations;
- prepare all photographic materials for printing, their subsequent processing or exhibition.

COURSE CONTENT

- Introduction to photography
- The history of photography
- The Basics of Analog Photography
- The Basics of Digital Photography
- Photoshop and digital photo processing
- Photo formats
- Photographic techniques
- Fotografski up

- Light and lighting
- Color
- Lenses and perspective
- Studio photo
- Fashion photography
- Photo agencies and agency photography
- Selection of photographs for the exhibition

GRADING SYSTEM

PRE-EXAM OBLIGATIONS - Historical Development of Photography – Essay (1 period in development) - Project - production of a photo exhibition - Exercises (knowledge of technique, digital formats, digital processing) - Presentation of photographs by thematic units	 10% 15% 5% 20%
Final exam – test in digital photography technique.	50%
TOTAL	**100%**

REQUIRED LITERATURE

1 Kelby, S., 2010-2018, Digital Photography 1-5, MIŠ, Zagreb.

2 Kelby, S., 2013, The Adobe Photoshop CS6 Book for Digital Photographers, Kelby Media Group Inc., Oldsmar.

ADDITIONAL LITERATURE

1 Popović, M., 2006, Digital Image Processing, Academic Thought, Belgrade.

1. Digital photography school, https://digital-photography-school.com/

MANDATORY EQUIPMENT:	DSLR or ML camera with equipment
ADDITIONAL EQUIPMENT:	Lenses, filters, stand, etc.

METHODS OF CONDUCTING CLASSES

Teaching is carried out through lectures, exercises, analysis of recorded material, practical application of presented methods and presentation of seminar papers.

Full course title:		**Business Trade**
Course code:		**MIB5**
Module level (education cycle):		**First cycle**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Summer semester**
Study program:		**Informacione tehnologije**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Elective**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**3**
Laboratory exercises:		**0**

Course objectives:

The aim of the course is to introduce students to the methods, techniques, principles and organization in business trade. Identifying the importance of modern trade on the development of the economy of developed countries in uncertain business conditions is an additional objective of the course. Furthermore, the aim of the course is to introduce students to the practice of contemporary business management in trade by analyzing the importance of e-commerce and marketing, and to enable them to understand the problems and challenges in contemporary trade and possible ways of analyzing and solving them.

Learning outcomes:

Upon completion of this course, students will be able to:

- identify the target market and key consumers as the most important competitive advantages;
- manage human resources as one of the key success factors in trade;
- independently manage trade organizations or functional units or processes within trade organizations;
- understand the importance of communication in modern trade organizations;
- formulate and develop their own financial plans within the framework of trade organizations;
- understand the impact of e-commerce in the development of market economies, especially in trade organizations;
- recognize the importance of proper determination of purchase and sale prices as well as trade margins for different products/services.

COURSE CONTENT

- Basics and special features of trade
- Plan development and strategic planning in trade
- Identifying target customers and collecting information needed in developing and modifying trade strategies
- Organizing and managing human resources in trade
- Leading and motivating human resources within trade organizations
- Communication within trade organizations
- Managing trade goods
- Formation of prices in trade
- Communicating with customers
- Business documentation in trade operations

- Financial strategy of a trading company and planning
- Supply chain operations and information system management
- Strategies for the growth and international expansion of trade enterprises
- Marketing trade
- E-commerce

GRADING SYSTEM

PRE-EXAM OBLIGATIONS - Seminar paper – at the beginning of the summer semester, students choose a topic for the seminar paper, which they are required to complete by the 12th week of the exercises, and with the assistance of a course assistant. - First partial test – after seven lessons or 50% of the theoretical material, the first partial test is held. - Attendance and participation - students secure points by their presence and participation at lectures and exercises.	- Seminar paper – 25 points - First partial test – 20 points - Class attendance and participation – 5 points
Final exam – covers all theoretical aspects of business trade related to 15 teaching units and contains 20 theoretical questions.	- Final exam – 50 points
TOTAL	**100 points**

REQUIRED LITERATURE

1 Dunković, D., 2015, Poslovno upravljanje u trgovini, Ekonomski fakultet, Zagreb.

ADDITIONAL LITERATURE

1 Dunkley, G., 2004, Free Trade-Myth, Reality and Alternatives, Zed Books, London.
2 Levy, M., Weitz, B.A., 2011, Retailing Management, McGrawHill/Irwin, New York.
3 Liebmann, H.P., Swoboda, B., Zentes, J., 2008, Handelsmanagement, Verlag Vahlen, Munchen.
4 Segetlija, Z., Knego, N., Knežević, B., Dunković, D., 2011, Ekonomika trgovine, Novi informator, Zagreb.
5 Kurtić, A., Kulović Dž., 2011, Poslovno vođenje, Centar za lično i profesionalno usavršavanje – WAMY, Sarajevo.
6 Župljanin S., 2010, Savremena trgovina – Strategija i politika trgovine u BiH, Nezavisni univerzitet Banja Luka.
7 Begtić, R., 1997, Marketing u trgovini, Ekonomski fakultet Univerziteta u Tuzli, Tuzla.
8 Segetlija, Z., Knego, N., Knetević, B., Dunković, D., 2011, Ekonomika trgovine, Novi informator, Zagreb.
9 Dedić, M., Klopić, R., 1997, Komuniciranje u trgovini, Ekonomski fakultet Univerziteta u Tuzli, Tuzla.
1. Begtić, R., 1998, Spoljnotrgovinsko poslovanje, Ekonomski fakultet Univerziteta u Tuzli, Tuzla.

MANDATORY EQUIPMENT:	Laptop, Projector
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Instruction is delivered through lectures, exercises, analysis of business cases and the creation and presentation of seminar papers.

Full course title:		**Multimedia Publishing**
Course code:		**M1**
Module level (education cycle):		**First cycle**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Summer semester**
Study program:		**Informational Technologies**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Elective**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**2**
Laboratory exercises:		**1**

Course objectives:

The aim of the course is to familiarize students with the technical prerequisites of multimedia publishing and to learn how to independently create different types of multimedia materials and publications. Students will get acquainted with the basic elements of publication design, with the technical methods of the process of production and printing, and with the preparation of a multimedia contribution for the mainstream media. The goal is to provide students with a theoretical and practical framework for independent creation of different types of multimedia content.

Learning outcomes:

Upon completion of this course, students will be able to:

- independently determine the visual identity, space, colors, photographs and other components of multimedia content;
- work on software necessary for the creation of multimedia publications;
- know the technical methods of the production and printing process.
- classify the components of multimedia content;
- analyze multimedia content and publications;
- independently prepare material for printing;
- independently prepare multimedia material for the web, radio and TV;
- understand the legal regulations that apply to this area.

COURSE CONTENT:

- Visual elements of the publication
- Typographic design
- Aspect ratio of image and text,
- The role of white space
- Use of paints
- Combination of graphic tools
- Preparation of graphic materials for printing
- Atypical Layout
- Visual effects and their application in creating professional publications
- Digitization and publishing
- Multimedia publishing on the Internet
- Social networks and multimedia publishing

- Web information and publishing
- Features of publishing in Bosnia and Herzegovina
- Legal legislation on publishing activities

GRADING SYSTEM

PRE-EXAM OBLIGATIONS - Partial tests (conducted in the middle of the semester) - Participation (lectures and exercises) - A project that is implemented in exercises, and presented before the final exam.	10 points 5 points 35 points
Final exam	50 points
TOTAL	**100 points**

REQUIRED LITERATURE

1 Hembri, R., 2015, Kompletan grafički dizajn, DON VAS, Beograd

ADDITIONAL LITERATURE

1 Osmančević, E., 2009, Demokratičnost WWW-komuniciranja, Friedrich Ebert Stiftung, Sarajevo.

2 Michael Kunczik, M., Zipfel. A., 1998, Uvod u publicističku znanost i komunikologiju, Friedrich Ebert, Zagreb.

1. Novaković, D., 1998, DTP – priručnik za stono izdavaštvo, Univerzitet u Beogradu, Beograd.

MANDATORY EQUIPMENT:	The software with the most modern graphic tools for the processing of text, photography, audio and video, as well as the access to the platforms suitable for the placement of multimedia content on the Internet.
ADDITIONAL EQUIPMENT:	Digital Camera

METHODS OF CONDUCTING CLASSES

Classes are conducted through lectures and exercises, creating individual multimedia content that will be incorporated into the open blog account of each student.

Full course title:		**Video Production**
Course code:		**M2**
Module level (education cycle):		**First cycle**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Summer semester**
Study program:		**Informacione tehnologije**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Elective**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**2**
Laboratory exercises:		**1**

Course objectives:

The aim of the course is to provide students with the knowledge to understand the principles of film language, as well as traditional and modern production methods, enabling them to independently create and produce their own works. Students will master the basics of computer and technical terminology and video techniques, focusing on the use of computers as tools in this process. Additionally, the goal is to equip students with the skills to create videos using computers, enhance image quality with all available software tools, creatively and experimentally use computers in audio and video art, create video effects, create video animations, and convert various audio and video formats.

Learning outcomes:

Upon completion of this course, students will be able to:

- create short-form videos with the use of a computer;
- correct image quality with the use of software tools;
- independently initiate and lead the process of filming and the entire production of advertising and other video material;
- analyze and evaluate the work of other authors in this field.
- produce and promote a film created with their own knowledge.

COURSE CONTENT

- Introduction to video and film production
- The history of the film
- Video recording
- Photography in film, technical image
- Introduction to different video and audio codecs and formats
- Cinematic means of expression. Film frame, plan and angle
- DV and HD camera recording
- Editing procedures, linear and non-linear editing
- Work in the Adobe Premiere Pro non-linear video editing program
- Basic animations and effects
- Sound control in editing
- Color and color balance
- Lenses, equipment & shooting accessories
- Post-production and editing
- The use of special effects in video production

GRADING SYSTEM

PRE-EXAM OBLIGATIONS - Test 1 – Professions in Production - Test 2 – production segments - Exercises – video technique, video editing - A visit to the radio-television with a written review of the production system,	 10% 15% 10% 15%
Final exam – the entire production of a film or commercial.	50%
TOTAL	**100%**

REQUIRED LITERATURE

1 Manović, L., 2015, Jezik novih medija, Clio, Beograd.
2 Skorin, V., 2008, Digitalni video-snimanje i montaža, Algebra, Zagreb.

ADDITIONAL LITERATURE

1 Droblas, A., Greenberg, S., 2004, Adobe Premiere Pro Bible, Wiley Publishing, Indiana.
2 Shaner, P., Everet – Jones, G., 2003, Digital Video, Peachpit Press, Berkeley.
3 Watkinson, J., 2001, An Introduction to Digital Video, Focal Press, Oxford,
1. Owens, J., Millerson, G., 2008, Video Production Handbook, 4th ed., Focal Press, Oxford.

MANDATORY EQUIPMENT:	DSLR, ML or digital video camera with basic equipment
ADDITIONAL EQUIPMENT:	Stand, light meter, filters, bag, lenses, other accessories and equipment

METHODS OF CONDUCTING CLASSES

Teaching is carried out through lectures, exercises, recording and analysis of business video materials with constant monitoring of the achieved results and presentation of examples from world practice, and presentation of seminar papers.

Full course title:		**Business Law and Taxes**
Course code:		**O4**
Module level (education cycle):		**First cycle**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Summer semester**
Study program:		**Informational Technologies**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Elective**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**3**
Laboratory exercises:		**0**

Course objectives:

The aim of the course is to acquire adequate theoretical and practical knowledge necessary to understand the basic legal concepts, organizational forms of business entities, legal norms, institutions and principles that regulate business relations. In addition, the goal is to introduce students to the contracts that are most often encountered in business practice, as well as to the tax system in BiH.

Learning outcomes:

Upon completion of this course, students will be able to:

- understand the manner, basic principles and principles of the functioning of the legal system of a state;
- understand the legal framework in which business entities operate and the basic characteristics of companies, and actively participate in solving legal problems in business entities;
- know the basic elements of contracts that appear in business practice, and participate in their drafting;
- understand the structure of public revenues and expenditures and understand the impact of public revenues and expenditures on the decision-making process of legal and natural persons.

COURSE CONTENT

- The concept and basic characteristics of companies, the concept of companies and entrepreneurs, management bodies and protection of the interests of owners and creditors
- Partnerships, characteristics, partnership, limited partnership
- Capital companies, characteristics, joint stock company, limited liability company
- Public enterprises, purpose of establishment, ownership and management
- Status changes and changes in the form of the company, mergers, acquisitions
- Liquidation and bankruptcy proceedings, reasons, purpose and subject of liquidation, tasks of the bankruptcy administrator, reasons and objectives of bankruptcy proceedings, effect on creditors, owners, employees and other interested parties
- Legal relations, concept and scope of legal relationship, objects of legal relationship, property

- Obligations, effect of the contract, causing damage to another, unilateral declaration of will, delay, change of the subject of the bond, fulfillment of obligations
- Securities, concept, types, rights in securities, bills of exchange, cheque, shares
- Tax system, history of origin, classification, characteristics, territorial affiliation, principles
- Elements of taxation, tax entity, taxpayer, tax destination, tax object, tax base and tax rate, tax capacity, tax cadastre and tax administration
- Direct and indirect taxes, characteristics, historical overview and significance, corporate income tax, customs duties, excise duties, VAT, elements of taxation for these types of taxes
- Other public revenues, taxes, fees, interest and penalties
- Double taxation and multiple taxation, types, inability to avoid double taxation, systemic avoidance of double taxation, measures in the domain of bilateral and multilateral relations between countries, tax evasion - causes and consequences
- Social security contributions, significance, method of collection, state funds, reform of the social security system and basic information on the functioning of private pension and health funds

GRADING SYSTEM

PRE-EXAM OBLIGATIONS - After eight weeks of lectures on topics in business law, a partial test is performed. - Opportunity to write a seminar paper on current topics of business law and taxes. The student can propose their own topic or, in consultation with the lecturer, jointly choose a topic. - Active participation and attendance at the course are credited.	Partial test 25 points. Seminar paper 20 points Participation at class 5 points
The final exam includes the basics of business law and taxes in the legal system of Bosnia and Herzegovina, knowledge of the characteristics of individual companies, obligations and contracts, types of taxes and methods of taxation.	Final exam 50 points
TOTAL	**100 points**

REQUIRED LITERATURE

1 Trifković, M., Simić, M., Trivun, V., Silajdžić, V. i Mahmutćehajić Novalija, F., 2015, Poslovno pravo, uvod u pravo, osnovi obligacija i privredna društva, Ekonomski fakultet u Sarajevu, Sarajevo.

ADDITIONAL LITERATURE

1 Trivun, V., Trifković, M., Silajdžić, V., Hošo, J., 2007, Nacionalno i evropsko pravo, Ekonomski fakultet u Sarajevu, Sarajevo.

1. Rajčević, M., 2007, Poslovno pravo, Pravni fakultet, Banja Luka.
2. Loza, B., 2000, Obligaciono pravo, Pravni fakultet S. Sarajevo, S. Sarajevo.
3. Zakonska regulativa u BiH.
1. Časopisi - preporučuje se korištenje članaka iz stručnih časopisa.

MANDATORY EQUIPMENT:	Laptop, Projector
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Instruction is delivered through lectures, exercises and discussions on cases from practice.

Full course title:		**Entrepreneurship**
Course code:		**MIB4**
Module level (education cycle):		**First cycle**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Summer semester**
Study program:		**Information Technology**
Module coordinator:		
Subject status:		**Elective**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**3**
Laboratory exercises:		**0**

Course objectives:

The aim of the course is to introduce students to the contemporary theoretical and practical aspects of creating, starting and managing a business. Additional goals of the course are for students to acquire knowledge and skills to identify, implement, and develop business ideas by understanding the elements of a business plan and how to create one, as well as understanding the various forms of financing for entrepreneurial ventures.

Learning outcomes:

Upon completion of this course, students will be able to:

- understand the essence of the entrepreneurial process;
- Analyze and identify alternatives in creating a business;
- critically analyze and recognize strengths and weaknesses, i.e. threats and opportunities of future business;
- identify the most important characteristics that distinguish a successful entrepreneur from others;
- independently start the process of registering their own business;
- create a business plan;
- independently formulate, organize and start the desired form of business activity.

COURSE CONTENT:

- Introduction to entrepreneurship
- Developing a successful business idea
- Innovation and entrepreneurship
- Creating a business plan
- The basic ways to start a business. Establishing a new business
- Purchase of an existing business
- The franchise system and the establishment of a franchise system
- Entrepreneurial strategies and tactics
- Individual model of entrepreneurship
- Corporate model of entrepreneurship
- Entrepreneurship and small business
- The future and prospects of small business
- Institutional, systemic and legal assumptions for entrepreneurship development
- Motivation as the key to business success

Financing of an entrepreneurial venture

GRADING SYSTEM:

PRE-EXAM OBLIGATIONS - After the 3rd week of lectures, topics for the seminar paper are assigned, where students can choose 12 topics related to the teaching process. - In the middle of the semester, Test 1 is held with questions that cover half of the material. - Two weeks before the end of semester, test 2 is held, which includes the second half of the material covered.	- Seminar 10 points - Test 1 15 points - Test 2 15 points - Attendance 10 points
The final exam includes questions related to the theoretical and practical aspects of the application of entrepreneurship.	Final exam 50 points
TOTAL	**100 points**

REQUIRED LITERATURE

1 Šarić, D., 2020, Poduzetništvo, Evropski Univerzitet „Kallos“ u Tuzli, Tuzla.

ADDITIONAL LITERATURE

1 Čizmić, E., Crnkić, K., 2012, Strateško poduzetništvo, Ekonomski fakultet u Sarajevu, Sarajevo.
2 Ilić, M., Nadoveza, B., 2012, Poduzetništvo, Evropski univerzitet, Brčko.
3 Baringer B., Duane Ireland R., 2010, Poduzetništvo-uspješno pokretanje novih biznisa (izdanje na bosanskom jeziku izdaje ''OFF-SET'' d.o.o. Tuzla u saradnji sa Centrom za razvoj poduzetništva-Tuzla.
4 Dedić M.,Umihanić B., 2004, Osnove menadžmenta i poduzetništva,Ekonomski Institut dd, Tuzla.
5 Buble, M., Kružic, D., 2006, Poduzetništvo: realnost sadašnjosti i izazov budućnosti, RRIF Plus, Zagreb.
6 Pokrajac, S., Tomić, D., 2008, Preduzetništvo, Alfa-Graf NS, Novi Sad.
7 Škrtic, M., 2006, Poduzetništvo, Sinergija, Zagreb.
1. Časopisi - preporučuje se korištenje članaka iz ekonomskih časopisa

MANDATORY EQUIPMENT:	Laptop, Projector
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES:

Instruction is delivered in the form of lectures, exercises, seminar papers, tests and examples from practice.

Full course title:		**E-services**
Course code:		**I7**
Module level (education cycle):		**First cycle**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Summer semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Elective**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**3**
Laboratory exercises:		**0**

Course objectives:

The aim of the course is to familiarize students with the technical and technological prerequisites and specifics of electronic services (e-government, e-health, e-education, and e-entertainment). Students will gain basic knowledge of the application of information and communication technologies in the field of electronic services and practical skills applicable to the development of components in the field of electronic services. Additionally, the goal is for students to master the basic knowledge and skills needed to participate in the implementation of e-service solutions.

Learning outcomes:

Upon completion of this course, students will be able to:

- describe and distinguish the goals and consequences of the application of information and communication technologies in the field of e-services;
- independently analyze the success of individual countries in the development of e-government;
- analyze the prerequisites and obstacles to the development of e-services;
- identify the necessary elements of the infrastructure for the development of e-services.

COURSE CONTENT

- The concept of e-services
- Technological, organizational, legal, procedural aspects of e-services
- The concept of a strategy for the introduction and implementation of e-services
- Communication and software infrastructure for E-Services
- Application of ICT in public administration
- Standards in e-government systems
- eGovernment legal framework
- Application of ICT in health care
- Telemedicine and telemedicine systems
- Application of ICT in entertainment
- Tools for the development of components and systems for e-entertainment
- Application of ICT in education
- Electronically supported education systems
- Smart governance, health and education
- Directions for the development of e-services

GRADING SYSTEM

PRE-EXAM OBLIGATIONS - Partial tests - Project development - Seminar paper - Attendance at classes - Participation - Exercises	50%
Final exam	50%
TOTAL	**100%**

REQUIRED LITERATURE

1. Radenković, B., Despotović-Zrakić, M., Bogdanović, Z., Barać, D., Labus, A., 2015, Elektronsko poslovanje, Fakultet organizacionih nauka, Beograd.

ADDITIONAL LITERATURE

1. Garson, G. D., 2006, Public information technology & e-governance: Managing the virtual state, Jones & Bartlett Publishers, London.
2. Simonson, M., Smaldino, S., Albright, M., Zvacek, S., 2008, Teaching and Learning at a Distance: Foundations of Distance Education, 4th Ed., Prentice Hall, NJ.
3. Maheu, M., Whitten, P., Allen, A., 2012, E-Health, Telehealth, and Telemedicine: A Guide to Startup and Success, Jossey-Bass Inc, NY.
4. Natkin, S., 2006, Video Games and Interactive Media: A Glimpse at New Digital Entertainment, AK Peters Ltd, Natick.

MANDATORY EQUIPMENT:	Computers, projector, Internet access
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Instruction is delivered through lectures, exercises, analysis of business cases and the creation and presentation of seminar papers.

Full course title:		**Information Systems Management**
Course code:		**I12**
Module level (education cycle):		**First cycle**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Summer semester**
Study program:		**Informatics and Computer Science**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Elective**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**3**
Laboratory exercises:		**0**

Course objectives:

The aim of the course is to introduce students to modern theoretical and practical aspects of information systems management. In addition, students will master the fundamentals of information and communication technologies used to support management and decision-making processes. Students will also be introduced to the basic tools needed to build information systems, and the types of information systems used in management.

Learning outcomes:

Upon completion of this course, students will be able to:

- understand the role and structure of information systems;
- gain practical knowledge of working with tools in the field of information systems management;
- design an information system management;
- understand the role of different information systems in business process management.

COURSE CONTENT

- Management theory
- Application of information technology in modern business
- Information systems in business systems
- Development of information systems
- Technological assumptions
- Business systems management
- Decision-making in business systems
- Information systems in management.
- Management information systems
- Designing management information systems
- Introducing, managing and maintaining management systems
- Decision Support Systems
- Expert Systems
- Artificial intelligence

ERP – Integrated Business Software

GRADING SYSTEM

PRE-EXAM OBLIGATIONS	50%

- Partial tests - Project development - Seminar paper - Attendance at classes - Participation - Exercises	
Final exam	50%
TOTAL	**100%**

REQUIRED LITERATURE

1 Šušić, I., 2012, Menadžment infomacioni sistemi, Univerzitet za poslovne studije, Banja Luka.

2 Stankić, R., Krsmanović, B., 2009, Upravljački informacioni sistemi, Fakultet spoljne trgovine, Bijeljina.

ADDITIONAL LITERATURE

1 Laudon, K., Laudon, J., 2006, Management Information Systems: Managing the Digital Firm, Prentice Hall, London.

1. Veljović, A., Radojičić, M., Vesić, J., 2008, Menadžment informacioni sistemi, Univerzitet u Kragujevcu, Kragujevac.

MANDATORY EQUIPMENT:	Computers, projector, Internet access
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Instruction is carried out through lectures, exercises, analysis of business cases and the creation and presentation of seminar papers.

Full course title:		**Public speaking techniques**
Course code:		**TK12**
Module level (education cycle):		**First cycle**
ECTS credits:		**6**
Duration:		**One semester**
Semester:		**Summer semester**
Study program:		**Information Technology**
Module coordinator:	**Lecturer:**	
	Teaching Assistant:	
Subject status:		**Elective**
Access restrictions:		**/**
HOURS PER WEEK		
Lectures:		**2**
Auditory exercises:		**3**
Laboratory exercises:		**0**

Course objectives:

The aim of the course is for students to acquire the knowledge and basic skills necessary for public speaking in various contexts, from formal presentations to informal conversations with the public. Students will learn about the importance of public speaking, the use of the body and voice in communication, and how to prepare and present an effective speech. In the practical part, students will work on performance segments of public performances such as: posture, breathing, speech, diction and communication with the audience. The aim of the course is also to overcome stage fright from public speaking and to create self-confidence. By applying knowledge and skills in practice, students will be able to give a quality public appearance regardless of the type of public speaking event.

Learning outcomes:

Upon completion of this course, students will be able to:

- Explain the theoretical elements of public appearances used in mass communication
- Recognize and analyze types of public appearances that will facilitate the way of communicating and presenting
- Develop public speaking skills
- Prepare key messages and create a structure of public speaking as important elements in this type of communication in order to recognize negotiation strategies
- Encouraging creativity and innovation in public speaking
- Increase the understanding of the importance of oratory and communication as an essential element in negotiation and presentation skills
- Independently create a presentation of a public appearance with all the learned elements on a topic or part of a topic from a communication perspective
- Learn how to prepare and present an effective public appearance for professions requiring verbal communication
- Master public speaking techniques for leading meetings, conducting interviews and delivering presentations
- Master exercises and techniques to reduce difficulties during public speaking

COURSE CONTENT

- Definition and significance of public speaking
- Elements and types of public speaking
- Preparations for public speaking - topic and target audience
- Structure and organization of performances (introduction, elaboration and conclusion)
- Verbal skills (articulation, diction, tempo and rhythm)
- Use of story and illustration to better convey the message
- Non-verbal communication (gestures, posture, connecting with the audience)
- Use of space
- Listening skill
- Relationship with the audience and stage fright: a monologue as a dialogue with the audience
- Building empathy and active listening
- Appearances in the media and preparation for appearances in the media
- Analysis and evaluation of performances
- Exercises and techniques for overcoming difficulties during public speaking
- Independent preparation and presentation using all the learned techniques and elements of public speaking

GRADING SYSTEM

PRE-EXAM OBLIGATIONS: - Partial tests (conducted in the middle of the semester) - Independent project (implemented during the exercises and presented before the final exam) - Participation (lectures and exercises)	 10 points 35 points 5 points
Final exam	**50 points**
TOTAL	**100 points**

REQUIRED LITERATURE

1. The Art of Public Speaking, Deb Gotessman, Buzz Mauro, Jesenski and Turk Zagreb

ADDITIONAL LITERATURE

1. Talk like TED: The 9 Public - Speaking Secrets of the Worlds Top Minds - Carmine Gallo
2. Prezentacijom do uspjeha, Jerry Weissman (2006), Mate Zagreb
3. Glas Glumca, Marina Marković, (2002), Clio
4. Moć Glasa, Judy Apps (2011), Ostvarenje doo, Buševac

MANDATORY EQUIPMENT:	Computer, projector, internet access
ADDITIONAL EQUIPMENT:	N/A

METHODS OF CONDUCTING CLASSES

Instruction is delivered through lectures, discussions, exercises

STUDY PROGRAMME: INFORMATION TECHNOLOGY– MATRIX OF LEARNING OUTCOMES

Successful implementation of the study program "Information Technology" enables graduates to acquire both general and specific competencies and skills, as a basis for their active and successful inclusion in the labor market, and later in private or public companies where they will find their place. The learning outcomes of the study program "Information Technology " are aligned with contemporary scientific requirements and international experiences. The learning outcomes of this study program are presented in Table 3.

Table 3. Learning outcomes at the level of the study program " Information Technology"

No.	Learning outcomes at the level of the study program " Information Technology “
1	Acquisition of basic theoretical knowledge related to the development and implementation of software and information systems.
2	Knowledge of the role and importance of informatics in a business entity and training for the development of business information systems in their work environment.
3	Developing the ability to identify business problems that can be solved with advanced ICT.
4	Ability to plan and design components of complex information systems, such as: modern technologies for developing business applications and data modeling, the use of software development tools, security technologies of operating systems and networks.
5	Knowledge and ability to apply methods in the development of software support for simple organizational processes at the execution level.
6	Ability to administer and maintain computer networks.
7	Knowledge of the essence and mastery of the concept of e-business with a strong focus on the practical application of the acquired knowledge.
8	Knowledge and implementation of different e-business models (e-commerce, e-marketing, e-banking, m-commerce).
9	Understand the security aspects of e-commerce.
10	Ability to design and develop information systems.
11	Independent writing of programs in C++ and Java.
12	Ability to design databases with the ability to administer them.
13	Knowledge and understanding of basic economic concepts, financial planning and ways of financing companies.
14	Ability to plan, collect, and analyze large amounts of data.
15	Ability to design and maintain a website.
16	Adapting software products to the needs of the organization that uses them.
17	Development of multimedia resources.
18	Mastering practical knowledge that enables you to start and manage your own business projects.

The Learning Outcomes Matrix is developed in order to show the coverage of learning outcomes at the level of the study program with learning outcomes at the level of subjects, especially compulsory ones. To verify the alignment of program outcomes and the outcomes of all courses, this analysis includes the creation of a Learning Outcomes Matrix, i.e., a matrix of the alignment of program outcomes and course outcomes, which is provided below for the study program "Information Technology."

In the columns, the learning outcomes of the study program are listed, and in the rows, individual courses are listed. For each course, an X mark is placed for each program outcome that the course contributes to achieving.

When checking the Matric, we can determine that all outcomes of the study program " Information Technology " are covered by the courses taken in the specified study program.

Learning Outcomes Matrix of the Study Program " Information Technology "

Course	Learning Outcomes Matrix of the Study Program " Information Technology "																	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
Mathematics	X													X				
Introduction to Computer Science and Information Technology	X	X			X	X				X								
Fundamentals of Programming	X			X	X			X		X	X					X		
Introduction to Information Systems	X	X	X	X	X					X						X		
Data structures and algorithms	X		X	X								X						
Operating Systems	X	X	X			X												
Business English	X		X															
Programming Languages and Programming	X			X							X					X		
Computer Networks	X	X			X	X												
Information Systems Development	X	X	X	X						X						X	X	
Database	X											X		X			X	
E-Business							X	X	X				X					
Object-oriented programming				X							X			X	X			
E- Commerce							X	X	X					X				X
Electronic Banking Payment System							X	X	X				X					X
Web Programming	X			X				X			X	X			X		X	
Customer Support Technologies and Systems	X	X	X	X									X	X		X	X	X
**Business Informatics*	X	X	X															X

**Fundamentals of Economics*			X										X					X
**Business communication*							X										X	X
**Computer graphics and animation*	X																X	
**Applied Financial Management*	X												X					X
**Fundamentals of Marketing and Internet Marketing*							X										X	X
**Direct marketing*							X							X			X	X
**Web design*				X							X				X		X	
** Project Management*	X									X			X					X
** Statistics and research methods*				X								X		X				
**Multimedia technologies*	X																X	
**Management*			X										X					X
**Digital photography*								X									X	
**Business Trade*							X	X										X
**Multimedia publishing*								X									X	
**Video production*								X									X	
**Business Law and Taxes*									X				X					X
**Entrepreneurship*													X					X
**E-services*								X					X					X
** Information Systems Management*	X	X		X						X								
**Public speaking techniques*																		X
Total	**19**	**8**	**9**	**11**	**4**	**3**	**7**	**10**	**4**	**6**	**5**	**4**	**10**	**7**	**3**	**5**	**13**	**16**

**Elective courses*