ERASMUS+ COURSE CATALOGUE 2025/2026

UNIVERSITY "VITEZ"

PROJECT ERASMUS+

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INTRODUCTION

Dear Students,
Welcome to the Faculty of Information Technologies

Our mission is to provide students with contemporary experiential learning through the teaching process, practice, study visits, conferences and many other activities.

For more information about our activities, please check the following links:

STUDYING TROUGHT PRACTICE
https://sveuciliste.unvi.edu.ba/za-studente/studiranje-kroz-praksu/

STUDENTS' SKEI CONFERENCE
https://sveuciliste.unvi.edu.ba/skei-2023/

SKEI-INTERNATIONAL INTERDISCIPLINARY JOURNAL
https://hrcak.srce.hr/en/skei

INTERNATIONAL STUDIES
https://international.unvi.edu.ba/

The list of subjects taught in English:

WINTER SEMESTER	SUMMER SEMESTER
-	• Computer Networks
-	• Protection of data and computer systems
• Collection of software requirements • Computer Forensics	• Advanced Computer Networks • Artificial Intelligence

SYLLABUS

NAME OF THE COURSE	COMPUTER NETWORKS		
LEVEL OF STUDY	Undergraduate		
Course code	1.2.1.I021	**Year of study**	II
Course holder(s)	prof. dr. sc. Tihomir Latinović	**Credit value (ECTS)**	8
Associates			

COURSE DESCRIPTION	
AIM OF THE COURSE	Students will master the basic techniques and practical approach to the design and construction of distributed information systems. It deals with the architecture and organization of distributed systems, computer networks and telecommunications, as well as problems in the design and implementation of distributed information systems.
Conditions for enrollment in the course and entry competencies required for the course	Architecture and Organization of Computer Systems
Expected outcomes Subject-level learning (10 outcomes)	Acquire basic skills in the field of computer networks. Design, installation, and maintenance of computer networks that use the TCP/IP protocol.
The content of the course is elaborated in detail according to the teaching schedule:	1. Computer networks and the Internet, 2. Application layer, 3. Web and HTTP protocol, e-mail on the Internet, file transfer and FTP, protocol, DNS 4. Sockets and ports, Programming, 5. Conveyor layer, Multiplexing and demultiplexing conveyor services, 6. Krosnica Datagram Protocol, UDA, 7. Connection-oriented transport protocol, TCP, 8. Network layer, network services, 9. Routers, Internet Protocol, IP 10. Data Link Layer, Multiple Access Protocols, ARP Protocol
Types of teaching:	In class / Online — Consultations
The Student's Responsibilities	

Monitoring the work of students (enter the share of ECTS credits for each activity so that the total number of ECTS credits corresponds to the credit value of the course):	**Attending classes**	1,6	**Research**		**Practical work**	
	Experimental work		**Paper**		**Left**	
	Essay		**Seminar paper**	1,2	**Other (enroll)**	
	Colloquium	2,4	**Oral exam**	0,4	**Other (enroll)**	
	Written exam	2,4	**Project**		**Left (enroll)**	

<table>
<tr><td>Evaluation and evaluation of students' work during and at the final exam</td><td colspan="5">Pre-examination activities
1. Attendance:
Attendance at lectures 10 points..... 10 %
Attendance at the exercises 5 points..... 5 %
Continuous Work / Interactivity 5 points..... 5 %
2. Seminar
Written part 15 points..... 15 %
Oral presentation 5 points..... 5 %
3. Colloquium 30 points..... 30 %
Exam
4. Written/Oral exam 30 points..... 30 %
TOTAL..... 100 %

NOTE: For part-time and DL students of FPN, FPE and FIT, point 2 (seminar paper or essay, case study) = 30%, point 2 (presentation of the seminar paper) = 0 – 5%, and point 5 is added, (attendance at the introductory lecture) = 0-5%. The student is entitled to the remedial exam referred to in points 1, 2, 3 and 4 if he/she is dissatisfied with the grade with the points earned or has not taken the test within the specified period or has not submitted the paper according to point 2.</td></tr>
<tr><td rowspan="2">Compulsory reading (available in the library and through other media)</td><td>Title</td><td>Number of copies in the library.</td><td>Availability through other media</td><td>Left</td></tr>
<tr><td>Computer Networking: A Top Down Approach 6th edition Jim Kurose, Keith Ross Addison-Wesley March 2012.</td><td></td><td>Internet</td><td></td></tr>
<tr><td>Supplementary literature</td><td colspan="4">Starčević D. "Distributed Information Systems", Belgrade, 2002.
D. Comer and R. Droms "Computer Networks And Internet 4th ed.", 2003, Prentice-Hall</td></tr>
<tr><td>Other (according to opinion of the proposer)</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

NAME OF THE COURSE	**PROTECTION OF DATA AND COMPUTER SYSTEMS**					
LEVEL OF STUDY	Undergraduate					
Course code	1.2.1.I032		**Year of study**		OR	
Course holder(s)	prof. dr. sc. Jasmin Azemović		**Credit value (ECTS)**		7	
Associates						
COURSE DESCRIPTION						
AIM OF THE COURSE	The main goal is for students to master basic knowledge in the field of computer and business systems protection. Students will master the technology and importance of protecting computer and address systems.					
Conditions for enrollment in the course and entry competencies required for the course	/					
Expected outcomes Subject-level learning (10 outcomes)	Students will acquire knowledge that is the basis for establishing an effective security system for computer and business systems. At the level of clerk for the security of computer and business systems.					
The content of the course is elaborated in detail according to the teaching schedule:	1. The Importance of Computer and Business Systems 2. Classification of attacks 3. Models of Insecurity 4. Safeguards 5. Organization of protection 6. Software protection 7. Data protection 8. Software Security 9. Cryptoprotection 10. Development of protection of computer and business systems					
Types of teaching:	In class / Online		Consultations			
The Student's Responsibilities						
Monitoring the work of students (enter the share of ECTS credits for each activity so that the total number of ECTS credits corresponds to the credit value of the course):	**Attending classes**	1.4	**Research**		**Practical work**	
	Experimental work		**Paper**		**Left**	
	Essay		**Seminar paper**	1.4	**Other (enroll)**	
	Colloquium	2.1	**Oral exam**		**Other (enroll)**	
	Written exam	2.1	**Project**		**Other (enroll)**	

NAME OF THE COURSE	COLLECTION OF SOFTWARE REQUIREMENTS		
LEVEL OF STUDY	Undergraduate		
Course code	2.2.10.I038	**Year of study**	IV
Course holder(s)	prof. dr. sc. Tihomir Latinović	**Credit value (ECTS)**	8
Associates			

COURSE DESCRIPTION	
AIM OF THE COURSE	The primary objective of the course is to master the measures and procedures for collecting software requirements in accordance with the logic of object-oriented thinking and the approach to the development of object-oriented programming style. The secondary objective of the course is to understand and learn the procedures of collecting software requirements in the software development process, from requirements analysis and specification, through software design and project implementation, including its testing, to delivery, maintenance and provision of technical support. The course represents the integration of several disciplines of management skills in the field of computer science.
Conditions for enrollment in the course and entry competencies required for the course	/
Expected outcomes Subject-level learning (10 outcomes)	Educational outcomes are acquired knowledge about measures and procedures that can be used in the development of complex software programs. By mastering this course, the student will be able to independently work (or manage) collecting software requirements for the realization of complex and multidisciplinary software projects. Organizational and managerial paradigms in the collection of software requirements during the design and development of computer programs.
The content of the course is elaborated in detail according to the teaching schedule:	1. Management of Software Collection Procedures Application of standards in the process of collecting software requirements. Quality Management Standards. Quality management throughout the software lifecycle. Requirements management. CASE tools and their impact on the quality of the software. Techniques and organizational tools in building an IS: interviews, meetings, observations, schematics and graphic representations, questionnaires, document collection, sampling, tables/matrices, models/simulations. 2. Advanced techniques in software engineering Advanced concepts in modeling and analysis of software requirements. Advanced Software Engineering Concepts. 3. Software Product Management Fundamentals of project management; implementation of the software product and metrics; validation and verification; the quality process; quality of the system and standards.
Types of teaching:	In class / Online — Consultations
The Student's Responsibilities	

Monitoring the work of students (enter the share of ECTS credits for each activity so that the total number of ECTS credits corresponds to the credit						
	Attending classes	0,7	**Research**		**Practical work**	1,3
	Experimental work		**Paper**		**Left**	

value of the course):	**Essay**		**Seminar paper**	2	**Other (enroll)**	
	Colloquium	2	**Oral exam**		**Other (enroll)**	
	Written exam	2	**Project**		**Left (enroll)**	

Evaluation and evaluation of students' work during and at the final exam

Pre-examination activities
1. Attendance:
Attendance at lectures 10 points..... 10 %
Attendance at the exercises 5 points..... 5 %
Continuous Work / Interactivity 5 points..... 5 %
2. Seminar
Written part 15 points..... 15 %
Oral presentation 5 points..... 5 %
3. Colloquium 30 points..... 30 %
Exam
4. Written/Oral exam 30 points..... 30 %
TOTAL..... 100 %

NOTE: For part-time and DL students of FPN, FPE and FIT, point 2 (seminar paper or essay, case study) = 30%, point 2 (presentation of the seminar paper) = 0 – 5%, and point 5 is added, (attendance at the introductory lecture) = 0-5%. The student is entitled to the remedial exam referred to in points 1, 2, 3 and 4 if he/she is dissatisfied with the grade with the points earned or has not taken the test within the specified period or has not submitted the paper according to point 2.

Compulsory reading (available in the library and through other media)	**Title**	**Number of copies in the library.**	**Availability through other media**	**Left**
	Booch, G., Rumbaugh, J. & Jacobson, I. (1999). The Unified Modeling Language User Guide. Addison-Wesley		Internet	
	IEEE (1987). Software Engineering Standards. The Institute of Electrical and Electronics Engineers, Inc. New York			

Supplementary literature

Pressman, R.S. (1997). Software Engineering A Practitions Approach. 4th Edition European Adaptation by D. Ince, McGraw-Hill.
Rumbaugh, J., Jacobson, I. & Booch, G. (1999). The Unified Modeling Language Reference Manual. Addison Wesley

Other (according to opinion of the proposer)						

NAME OF THE COURSE	COMPUTER FORENSICS		
LEVEL OF STUDY	Undergraduate		
Course code	1.2.1.I047	**Year of study**	IV
Course holder(s)	prof. dr. sc. Jasmin Azemović	**Credit value (ECTS)**	7
Associates			

COURSE DESCRIPTION	
AIM OF THE COURSE	By studying the subject of Computer Forensics, students are trained to theoretically adopt the basics of Computer Forensics
Conditions for enrollment in the course and entry competencies required for the course	
Expected outcomes Subject-level learning (10 outcomes)	Students will acquire knowledge in the field of digital forensics through the use of research methodology, and the application of statistical methods and procedures in digital forensic research. courses consist of performing practical exercises that are an integral part of taking the exam, primarily using the Magnet program, as well as other analytical tools for collecting data in the sphere of digital evidence, which will enable them to conduct research and use professional and scientific literature. By mastering the basic knowledge of Computer Graphics, students will be able to understand the basics of thinking and reasoning, in general and forensic science in particular.
The content of the course is elaborated in detail according to the teaching schedule:	1. Introduction to Computer Forensics 2. The History of Computer Forensics 3. Computer crime 4. Research Methodologies and Application of Statistical Methods and Procedures in Computer Forensic Research 5. The DFRWS model 6. The Reith , Carr and Gunsch model 7. The Ciardhuain model 8. The Beebe and Clark Model 9. Kruse and Heiser Model 10. America's Department of Justice - DOJ model 11. Lee's model 12. Model "Incident Response" 13. Eoghan Casey model 14. Carrier and Spafford model 15. High-tech crime – computer crime 16. Computer Crime Legislation 17. Digital forensics of a computer system 18. Digital Forensics in a Virtual Environment 19. Digital forensics of mobile devices 20. Basics of the MAGNET program – tools 21. Other Digital Forensics Programs 22. Free Digital Forensics Programs – A Hands-On Exercise
Types of teaching:	Ex Cathedral..... 50% Discussion..... 40% Guest lecturer..... 10%
	Case processing – group ..... 50% Case processing – individual ..... 40% Discussion – presentation 10%
The Student's Responsibilities	

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<tr><td rowspan="5">Monitoring the work of students (enter the share of ECTS credits for each activity so that the total number of ECTS credits corresponds to the credit value of the course):</td><td>Attending classes</td><td>1,5</td><td>Research</td><td></td><td>Practical work</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Paper</td><td></td><td>Left</td><td></td></tr>
<tr><td>Essay</td><td></td><td>Seminar paper</td><td>1,5</td><td>Other (enroll)</td><td></td></tr>
<tr><td>Colloquium</td><td>2</td><td>Oral exam</td><td></td><td>Other (enroll)</td><td></td></tr>
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Attendance at the exercises 5 points..... 5 %
Continuous Work / Interactivity 5 points..... 5 %
2. Seminar
Written part 15 points..... 15%
Oral presentation 5 points..... 5%
3. Colloquium 30 points..... 30 %
Exam
4. Written/Oral exam 30 points..... 30 %
TOTAL..... 100 %</td></tr>
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<tr><td></td><td colspan="2">1. Dragan Prlja, Mario Reljanović, Legal Informatics, Faculty of Law, Union University, Belgrade, 2010.
2. Vanja Korać, Digital Forensics as Data Archaeology in High-Tech Crime, Viminacium Center for New Technologies, Archaeological Institute Belgrade, 2012.</td><td colspan="2"></td><td></td><td></td></tr>
<tr><td>Supplementary literature</td><td colspan="6"></td></tr>
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NAME OF THE COURSE	ADVANCED COMPUTER NETWORKS		
LEVEL OF STUDY	Undergraduate		
Course code	1.2.1.I054	**Year of study**	IV
Course holder(s)	prof. dr. sc. Tihomir Latinović	**Credit value (ECTS)**	8
Associates			

COURSE DESCRIPTION	
AIM OF THE COURSE	Acquiring the knowledge and skills necessary to work with advanced communication systems and multimedia networking
Conditions for enrollment in the course and entry competencies required for the course	Computer Networks
Expected outcomes Subject-level learning (10 outcomes)	Development, installation and maintenance of advanced network services based on Internet technologies. Working with computer networks for the transmission of image and speech and data
The content of the course is elaborated in detail according to the teaching schedule:	1. LOCAL COMPUTER NETWORKS. MULTIPLE ACCESS PROTOCOLS. 2. ETHERNET. 3. VIRTUALIZATION OF THE DATA CONNECTION LAYER. ATM. MPLS. 4. WIRELESS TELECOMMUNICATION SYSTEMS. GSM MOBILE TELEPHONY. 3G. GPRS AND EDGE SERVICES. 5. WIRELESS AND MOBILE NETWORKS. CDMA. WI-FI WIRELESS LOCAL AREA NETWORK. BLUETOOTH. 6. MULTIMEDIA NETWORK APPLICATIONS. 7. STREAMING OF STORED AUDIO AND VIDEO. 8. VOICE COMMUNICATION OVER THE INTERNET. 9. PROTOCOLS FOR REAL-TIME INTERACTIVE APPLICATIONS. 10. RTP. RTPC. SIP. H323
Types of teaching:	Ex Cathedral..... 50% Discussion..... 40% Guest lecturer..... 10%
	Case processing – group ..... 50% Case processing – individual ..... 40% Discussion – presentation 10%

The Student's Responsibilities						
Monitoring the work of students (enter the share of ECTS credits for each activity so that the total number of ECTS credits corresponds to the credit value of the course):	**Attending classes**	1,5	**Research**		**Practical work**	
	Experimental work		**Paper**		**Left**	
	Essay		**Seminar paper**	1,5	**Other (enroll)**	
	Colloquium	2,5	**Oral exam**		**Other (enroll)**	
	Written exam	2,5	**Project**		**Left (enroll)**	

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1. Attendance:
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Attendance at the exercises 5 points..... 5 %
Continuous Work / Interactivity 5 points..... 5 %
2. Seminar
Written part 15 points..... 15%
Oral presentation 5 points..... 5%
3. Colloquium 30 points..... 30 %
Exam
4. Written/Oral exam 30 points..... 30 %
TOTAL..... 100 %</td></tr>
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<tr><td colspan="2">1. J. F. Kurose, K. W. Ross Computer Networking, CET 2009</td><td colspan="2"></td><td></td><td></td></tr>
<tr><td>Supplementary literature</td><td colspan="6"></td></tr>
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</table>

NAME OF THE COURSE	ARTIFICIAL INTELLIGENCE		
LEVEL OF STUDY	Undergraduate		
Course code	2.2.10.I050	**Year of study**	IV
Course holder(s)	prof. dr. sc. Tihomir Latinović	**Credit value (ECTS)**	8
Associates			
COURSE DESCRIPTION			
AIM OF THE COURSE	Artificial intelligence (AI) is a field that is dedicated to the study of a computational model of intelligent behavior. Common to all areas of artificial intelligence is the creation of agents or devices that have the characteristics of intelligent behavior; problem solving, presentation of knowledge, reasoning, learning, perception and interpretation. The amount of different material in the course reflects the diversity of these concepts. During the course, we will look at the basic issues and issues in the field of AI and explore the basic techniques of this field. The course is project-oriented, with practical tasks that are solved during the course, using the NetLogo programming environment based on LISP and Prolog programming languages.		
Conditions for enrollment in the course and entry competencies required for the course			
Expected outcomes Subject-level learning (10 outcomes)	Students will have an overview of artificial intelligence methods and techniques as well as different approaches to the field. They will understand the advantages and disadvantages of different approaches and identify problems in which it would be appropriate to adequately apply certain methods of artificial intelligence. Students will gain hands-on experience developing software solutions for a variety of AI problems, including state space search, gaming, automatic inference, logic programming, neural networks, and biologically inspired optimization. After passing this course, the student will be able to: • define the basic concepts of artificial intelligence • distinguish between symbolic and connectivist approaches to artificial intelligence • apply statespace search algorithms and biologically inspired optimization algorithms to simpler problems • Apply logic programming to solve simpler logic problems. • apply automatic inference procedures to simpler logical problems • compare different approaches to displaying obscure knowledge • assess the applicability of individual AI approaches to a given problem • summarize the philosophical aspects of artificial intelligence		
The content of the course is elaborated in detail according to the teaching schedule:	1. An overview of the field of artificial intelligence. Historical development. Directions of development and the latest trends. Relations with other areas. The concept of intelligence and the Turing test. 2. Troubleshoot by searching the state space. Blind search techniques. 3. Directional search techniques. Algorithm A*. The problem of satisfying the condition. Gaming. The minimax algorithm. 4. Knowledge and reasoning. First-order logic. Proving theorems. Unification. A rule of resolution. 5. Logical programming. Prologue. 6. Semantic networks, frameworks, and rules. Ontologies. Expert systems.		

	7. Natural language processing. 8. Unreliable knowledge and reasoning. Models based on probability theory. Bayesian scheme. Fuzzy logic and fuzzy reasoning. 9. An introduction to machine learning. Naïve Bayesian classifier. Decision trees. 10. Enhanced learning. 11. A Connectivist Approach to Artificial Intelligence. Neural networks. 12. The perceptron algorithm. Backward error propagation algorithm. 13. Computer intelligence. 14. Genetic algorithm. 15. Ant colony algorithm
Types of teaching:	Ex Cathedral..... 50% Discussion..... 40% Guest lecturer..... 10% Case processing – group ..... 50% Case processing – individual ..... 40% Discussion – presentation 10%

The Student's Responsibilities						
Monitoring the work of students (enter the share of ECTS credits for each activity so that the total number of ECTS credits corresponds to the credit value of the course):	**Attending classes**	1,5	**Research**		**Practical work**	
	Experimental work		**Paper**		**Left**	
	Essay		**Seminar paper**	1,5	**Other (enroll)**	
	Colloquium	2,5	**Oral exam**		**Other (enroll)**	
	Written exam	2,5	**Project**		**Left (enroll)**	

Evaluation and evaluation of students' work during and at the final exam	**Pre-examination activities** 1. Attendance: Attendance at lectures 10 points..... 10 % Attendance at the exercises 5 points..... 5 % Continuous Work / Interactivity 5 points..... 5 % 2. Seminar Written part 15 points..... 15% Oral presentation 5 points..... 5% 3. Colloquium 30 points..... 30 % **Exam** 4. Written/Oral exam 30 points..... 30 % TOTAL..... 100 %

Compulsory reading (available in the library and through other media)	**Title**	**Number of copies in the library.**	**Availability through other media**	**Left**
	3. Stuart Russell, Peter Norvig. Artificial Intelligence - A Modern Approach. Prentice Hall, 1995. 4. George F. Luger. Artificial Intelligence: Structures and Strategies for Complex Problem			

	Solving. Addison-Wesley, 2005. 5. Artificial Intelligence: A Modern Approach. Stuart Russell and Peter Norvig Prentice Hall, 2009.					
Supplementary literature						
Other (according to opinion of the proposer)						