



POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

ACADEMIC YEAR: 2022/2023

1. GENERAL COURSE INFORMATION

1.1 Course name	Security of computer networked systems			
1.2 Study program/s	Undergraduate professional study of Computer Science			
1.3 Course status (O,E)	O/E	1.6 Mode of instruction (number of hours)	Lectures	30
1.4 Course code	5244		Exercises	30
1.5 Course abbreviation	SRUS		Seminars	
1.6 Semester	V		E-learning	
1.7 ECTS	5	1.7 Place and time of instruction	The premises of the Polytechnic of Međimurje in Čakovec, according to the schedule published on the website	

2. TEACHING STAFF

2.1 Course leader/s-title	Jurica Trstenjak/ senior lecturer	contact	jtrstenjak@mev.hr
		contact	
2.2 Assistant/s- title	Robert Poljak, lecturer	contact	rpoljak@mev.hr
		contact	
2.3 Instruction held by- title	Jurica Trstenjak/ senior lecturer Robert Poljak, lecturer	contact	jtrstenjak@mev.hr

3. COURSE DESCRIPTION

3.1 Course goals	Introduction to basic threats to computer systems and computer networks. Mastering the basic mechanisms for protection against attacks. Meeting with system architectures, protocol architectures, protocols, and security enhancement tools.
3.2 Prerequisites	Passed Computer Network course
3.3 Course outcomes	After successfully completing the course, students will be able to: O1 - explain basic concepts and concepts related to computer security O2 - describe the types of security threats and attacks and the most common methods of defense O3 - Explain ways for remote access (SLIP, PTP, "tunneling", wireless protocol, RADIUS, TACACS), ways to establish a secure connection O4 - List and explain attacks on DNS servers and how to protect yourself and how to improve the protection of network devices (routers and network barriers) O5 - Explain EAP messaging, Request / Response packet type, Success / Failure packet type and EAP-TLS O6 - List and explain the basic algorithms for data encryption (DES, 3DES, RIJNDAEL, RSA, RC4, VIGENERE and HASH function)
3.4 Course content	Basic goals of the data protection system. Identification. Protection topology. Risk evaluation. Attacks. Viruses. Elements account. networks and connectivity. Network barriers, routers, switches. Remote access. Online traffic monitoring. Unauthorized intrusions into wireless networks. EAP protocol and methods. Encryption algorithms.

3.5 Types of coursework	x	Lectures	x	Exercises		Blended e-learning		Individual activities	x	Laboratory																																																																																
		Seminars and workshops	x	Distant learning		Field classes	x	Multimedia and network		Mentorship																																																																																
		Other																																																																																								
3.6 Language of instruction																																																																																										
3.7 Monitoring students' work (enter the number of ECTS credits for each activity so that the total number of ECTS credits is equal to the total ECTS value of the course, 1 ECTS = 30 hours)	2	Class attendance			Seminars			Essay																																																																																		
		Class activity			Project			Report/paper																																																																																		
	3	Exam (midterm exams)			Practical task			Continuous knowledge check																																																																																		
		Written exam			Experimental work																																																																																					
		Oral exam			Research																																																																																					
3.8 Assessment and evaluation of students' work during classes and at the final exam	<table border="1"> <thead> <tr> <th>Activity specification</th> <th>Percent %</th> <th>Points</th> </tr> </thead> <tbody> <tr> <td colspan="3" style="text-align: center;">Assessment during instruction</td> </tr> <tr> <td>Attendance</td> <td>5%</td> <td>5</td> </tr> <tr> <td>Class activity</td> <td>5%</td> <td>5</td> </tr> <tr> <td>Practical task</td> <td>20%</td> <td>20</td> </tr> <tr> <td>Midterm exam 1</td> <td>30%</td> <td>30</td> </tr> <tr> <td>Midterm exam 2</td> <td>30%</td> <td>30</td> </tr> <tr> <td>Oral part of midterm</td> <td>10%</td> <td>10</td> </tr> <tr> <td colspan="3" style="text-align: center;"><i>Exam assessment for the students who failed to fulfil all the obligatory requirements during the semester</i></td> </tr> <tr> <td>Written exam</td> <td>60%</td> <td>60</td> </tr> <tr> <td>Oral exam</td> <td>10%</td> <td>10</td> </tr> <tr> <td>Total:</td> <td>100%</td> <td>100</td> </tr> </tbody> </table>										Activity specification	Percent %	Points	Assessment during instruction			Attendance	5%	5	Class activity	5%	5	Practical task	20%	20	Midterm exam 1	30%	30	Midterm exam 2	30%	30	Oral part of midterm	10%	10	<i>Exam assessment for the students who failed to fulfil all the obligatory requirements during the semester</i>			Written exam	60%	60	Oral exam	10%	10	Total:	100%	100																																												
	Activity specification	Percent %	Points																																																																																							
	Assessment during instruction																																																																																									
	Attendance	5%	5																																																																																							
	Class activity	5%	5																																																																																							
	Practical task	20%	20																																																																																							
	Midterm exam 1	30%	30																																																																																							
	Midterm exam 2	30%	30																																																																																							
	Oral part of midterm	10%	10																																																																																							
	<i>Exam assessment for the students who failed to fulfil all the obligatory requirements during the semester</i>																																																																																									
	Written exam	60%	60																																																																																							
Oral exam	10%	10																																																																																								
Total:	100%	100																																																																																								
3.9 Assessment criteria – analysis per learning outcomes	<table border="1"> <thead> <tr> <th colspan="8">Ways of evaluating learning outcomes</th> </tr> <tr> <th></th> <th>Attendance</th> <th>Activity</th> <th>Mid-term exam 1</th> <th>Mid-term exam 2</th> <th>Practical work</th> <th>Oral part of midterm</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>Outcome 1</td> <td></td> <td></td> <td>10</td> <td></td> <td>3</td> <td>1</td> <td>14</td> </tr> <tr> <td>Outcome 2</td> <td></td> <td></td> <td>12</td> <td></td> <td>3</td> <td>1</td> <td>16</td> </tr> <tr> <td>Outcome 3</td> <td></td> <td></td> <td>8</td> <td></td> <td>3</td> <td>2</td> <td>13</td> </tr> <tr> <td>Outcome 4</td> <td></td> <td></td> <td></td> <td>10</td> <td>3</td> <td>2</td> <td>15</td> </tr> <tr> <td>Outcome 5</td> <td></td> <td></td> <td></td> <td>10</td> <td>4</td> <td>2</td> <td>16</td> </tr> <tr> <td>Outcome 6</td> <td></td> <td></td> <td></td> <td>10</td> <td>4</td> <td>2</td> <td>16</td> </tr> <tr> <td>Outcome not-related</td> <td>5</td> <td>5</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Total</td> <td>5</td> <td>5</td> <td>30</td> <td>30</td> <td>20</td> <td>10</td> <td>100</td> </tr> </tbody> </table> <p>Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)</p> <p>Points Grade</p> <p>89 – 100 excellent (5)</p> <p>76 – 88 very good (4)</p> <p>63 – 75 good (3)</p> <p>50 – 62 pass (2)</p> <p>0 – 49 fail (1)</p>										Ways of evaluating learning outcomes									Attendance	Activity	Mid-term exam 1	Mid-term exam 2	Practical work	Oral part of midterm	Total	Outcome 1			10		3	1	14	Outcome 2			12		3	1	16	Outcome 3			8		3	2	13	Outcome 4				10	3	2	15	Outcome 5				10	4	2	16	Outcome 6				10	4	2	16	Outcome not-related	5	5						Total	5	5	30	30	20	10	100
	Ways of evaluating learning outcomes																																																																																									
		Attendance	Activity	Mid-term exam 1	Mid-term exam 2	Practical work	Oral part of midterm	Total																																																																																		
	Outcome 1			10		3	1	14																																																																																		
	Outcome 2			12		3	1	16																																																																																		
	Outcome 3			8		3	2	13																																																																																		
	Outcome 4				10	3	2	15																																																																																		
	Outcome 5				10	4	2	16																																																																																		
	Outcome 6				10	4	2	16																																																																																		
	Outcome not-related	5	5																																																																																							
	Total	5	5	30	30	20	10	100																																																																																		
3.10 Specific features related with taking the course	In order for a student to pass the course, he / she must earn at least 50% of the points available for that learning outcome for EACH learning outcome. If a student does not achieve a sufficient number of points in the 1st midterm exam																																																																																									

	(minimum 50% of the total number of points), he / she cannot take the next midterm exam. Once achieved points in intermediate exams for each learning outcome are no longer deleted unless the student decides to correct the result for each learning outcome, whereby the points won until then are deleted and newly achieved points for that learning outcome are entered. The final grade is obtained on the exam period and is the sum of points earned during classes. Students who have not colloquized access the written and oral part of the exam where all learning outcomes are checked.	
3.11 Students obligations	<p>Full-time students are required to attend at least 70% of the total number of hours of lectures and exercises in order to exercise the right to take the exam. Part-time students are required to attend at least 30% of the total number of hours of lectures and exercises in order to exercise the right to take the exam. If the student has not fulfilled all the obligations set by the course, he is obliged to attend the lectures again and meet the conditions for taking the exam.</p> <p>Attendance can be offset by online tuition, organised webinars and added assignments given by teachers. One lesson lasts 45 minutes, and several hours form a teaching unit. Absence from one teaching unit is counted as one absence. Delays and apologies are recorded separately. In that case, if the student missed more than 50% of classes, and has a justifiable reason/apology, the request should be submitted to the Department Council, which then decides on the justification of student absences with the obligatory opinion of the course leader.</p>	
3.12 Written assignments		
3.13 Required reading	1.	<i>Kaufman C., R. Perlman, M. Speciner: Network Security: Private Communication in a Public World, 2nd edition, Pearson Education, 2002</i>
3.14 Additional reading	1.	
4 ADDITIONAL COURSE INFORMATION		
4.1 Quality control	The quality of the program, teaching process, teaching skills and level of mastery of the material will be established by conducting a written evaluation based on questionnaires, and in other standardised ways and in accordance with the by-laws of the Polytechnic of Međimurje in Čakovec.	
4.2 Contact the teacher	Students can contact the teacher during the office hours and during classes, while for short questions and explanations they can contact him/her any day during working hours by coming in person or by landline. It is also possible to ask questions by e-mail, which will be answered in 48 hours at the latest. It is desirable for students to come as often as possible for any possible questions during the teacher's office hours.	
4.3 Information about the course	It is the obligation of each student to be regularly informed about the course. All notifications about the classes or possible postponement of classes will be posted on the bulletin board and on the website of the Polytechnic at least 24 hours in advance.	
4.4 Course contribution to the study program	<p>Use English in the domain of ICT in communication with experts and lay people.</p> <p>Analyze user needs (research and detect data sources, currently present business systems, technological limitations, specifics of the business environment).</p> <p>Apply standards, methods and techniques to analyze security threats and combat threats.</p>	