1. Semester

1.	English language 1	60	4
2.	Physics	60	6
3.	Basics of Electrical Engineering and Electronics	75	7
4.	Mathematics 1	75	7
5.	Economics and Organisation of Business Systems	45	5

2. Semester

1.	English Language 2	60	4
2.	Digital Electronic Circuits	75	6
3.	Programming	75	7
4.	Mathematics 2	75	7
5.	Computer Application	75	5

3. Semester

1.	Communication Skills	75	4
2.	Algorithms and Data Structures	75	7
3.	Probability and Statistics	60	6
4.	Computer Architecture	75	6
5.	Object Oriented Programming 1	60	6

4. Semester

1.	Databases 1	60	5
2.	Operating Systems	60	5
3.	Computer Networks	60	6
4.	Programming Tools	60	5
5.	Web Design (E)	60	4
6.	Multimedia (E)	60	4
7.	Digital Signal Processing (E)	60	4
8.	German Language (E)	60	4

5.Semester

1.	Programming and Software Engineering	60	5
2.	Object Oriented Programming 2	60	5
3.	Computer Network Administration	60	5
4.	Network System Security	60	5
5.	XML Programming (E)	60	5
6.	PHP Programming (E)	60	5
7.	Databases 2 (E)	60	5
8.	Digital Marketing (E)	60	6

6. Semester

1.	Management	60	5
2.	Integration of Computer Systems (E)	60	5
3.	Development of Computer Games (E)	60	5
4.	Pattern Recognition (E)	60	5

(E) Elective Course

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	English Language 1			
1.2 Study program/s	Undergraduate professional study in Computer Science			
1.3 Course status (O,E)	O	**1.6 Mode of instruction (number of hours)**	**Lectures**	15
1.4 Course code			**Exercises**	45
1.5 Course abbreviation	EJ1		**Seminars**	
1.6 Semester	1		**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 timetable published on the website	

2. TEACHING STAFF

2.1 Course leader/s-title	Marija Miščančuk, senior lecturer	**contact**	mmiscancuk@mev.hr
	Martina Sobočan, senior lecturer	**contact**	msobocan@mev.hr
2.2 Assistant/s- title		**contact**	
2.3 Instruction held by-title	Jurica Vugrin, associate	**contact**	jurica.vugrin@mev.hr

3. COURSE DESCRIPTION

3.1 Course goals	After completing the course, the student will be able to use English through all four language skills in the context of the profession.
3.2 Prerequisites	None
3.3 Course outcomes	After successfully completing the course, students will be able to: I1 - Analyse the grammatical structures of the English language so that they can be applied in everyday situations I2 - Use basic terms related to professional vocabulary in professional texts in English I3 – Create a written work including appropriate vocabulary and grammatical structures I4 - Design an oral presentation on a specific topic in English
3.4 Course content	The course consists of a section in which students are introduced to the basic components of business English. They are also introduced to the basic grammatical structures necessary for communication in the above context in English, as well as the basics of culture and civilization of the English-speaking countries.

3.5 Types of coursework

x	Lectures	x	Exercises		Blended e-learning	x	Individual activities		Laboratory
x	Seminars and workshops	x	Distant learning		Field classes		Multimedia and network		Mentorship
	Other								

3.6 Language of instruction	Croatian/English

3.7 Monitoring students' work (enter the

0.5	Class attendance	1	Seminars		Essay
0.5	Class activity		Project		Report/paper

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)	1	Midterm exams		Practical task		Continuous knowledge check
		Written exam		Experimental work		
	1	Oral exam		Research		

3.8 Assessment and evaluation of students' work during classes and at the final exam

Activity specification	Percent %	Points
Assessment during instruction		
Attendance	5%	5
Seminar/ project/ essay	15%	15
Presentation	10%	10
Midterm exam 1	30%	30
Midterm exam 2	30%	30
Exam assessment for the students who failed to fullfil all the obligatory requirements during the semester		
Written exam	*90%*	*90*
Oral exam	*10%*	*10*
Total:	**100%**	**100**

Written exam

The written exam is taken through two midterm exams, a seminar and a presentation, or a final written exam.

Oral exam

An assistant or another student must be present in the room during the oral exam. Exam questions must be written down to determine if all outcomes have been verified. The oral exam is mainly used as an upgrade to the written one, only exceptionally as the only form of knowledge assessment.

3.9 Assessment criteria – analysis per learning outcomes

Ways of evaluating learning outcomes							
	Attendance	**Class activity**	**Mid-term exam 1**	**Mid-term exam 2**	**Seminar paper**	**Prezentation**	**Total**
Outcome 1			15	15			
Outcome 2			15	15			
Outcome 3					15		
Outcome 4						10	
Outcome not-related	5	10	30	30	15	10	
Total	**5**	**10**	**30**	**30**	**15**	**10**	**100**

	Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome) Points Grade 89 – 100 excellent (5) 76 – 88 very good (4) 63 – 75 good (3) 50 – 62 pass (2) 0 – 49 fail (1)	
3.10 Specific features related with taking the course	In the semester, students will write 2 midterm exams, write a seminar on a specific given topic and give a presentation on the same topic. The 1st midterm exam is written after the first 7 weeks of classes and covers the learning outcomes covered in the first 7 weeks. The 2nd midterm exam is written after the other 7 weeks of classes and covers the learning outcomes covered in the other 7 weeks of classes. Midterm exams are taken during the teaching period in the 1st week after each cycle of 7 weeks of teaching. The type of questions is defined by the teacher, but all questions and tasks cover the course material or learning outcomes. The topic of the seminar is determined by the teacher in cooperation with the student, and the date of the seminar is defined. After the submission of the seminar, the date of the presentation is determined. A student who does not take any of the intermediate exams or does not submit a seminar or give a presentation has not met the conditions for exemption from the written exam and must take the written exam, followed by an oral exam. The final grade is obtained in the oral part of the exam. If the student collects 50% of the points of each outcome, he / she directly takes the oral exam. If a student does not achieve a sufficient number of points on the midterm exam, he / she cannot take the next midterm exam. Once won points in midterm exams for each learning outcome are no longer deleted unless the student decides to correct the result for a particular learning outcome, whereby the points won until then are deleted and newly earned points are entered for that learning outcome.	
3.11 Students obligations	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. 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.	
3.12 Written assignments	Seminar papers must be computer written and may have a maximum of 12 text cards (Times New Roman, font 12) from introduction to conclusion, together with pictures, appendices, tables, etc. Seminar papers must have an adequate title page, content, marked pages and literature. The seminar paper should be divided into chapters and contain a list of references and a list of figures and tables and graphs and finally a summary / conclusion in the size of 250 words. The student guarantees the authenticity of the work with his signature.	
3.13 Required reading	1.	S.R. Esteras: Infotech English for computer users, CUP, 2008
	2.	R. Murphy: Grammar in Use, Cambridge University Press, Third Edition 2007
3.14 Additional reading	1.	E.H. Glesdinning, J. Mc Ewan: Oxford English for Information Technology, Oxford University Press, 2002
	2.	S.R. Esteras, E.M. Fabre: ICT, Professional English in Use, CUP, 2007

	3.	Advanced Oxford Dictionary
	4.	
	5.	
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	IS 1Apply the acquired learning skills, basic knowledge of the profession and problem solving necessary for continuing studies at a higher level. IS2 Use English in the appropriate domain in communication with professionals and lay people.	

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	**Pyisics**			
1.2 Study program/s	Undergraduate professional study of Computer Science			
1.3 Course status (O,E)	0	**1.6 Mode of instruction (number of hours)**	**Lectures**	30
1.4 Course code	5002		**Exercises**	30
1.5 Course abbreviation	FIZ		**Seminars**	
1.6 Semester	I		**E-learning**	
1.7 ECTS	6	**1.7 Place and time of instruction**		

2. TEACHING STAFF

2.1 Course leader/s-title	PhD. Marina Grabar Branilović, lecturer	**contact**	marina.grabar.branilovic@mev.hr
		contact	
2.2 Assistant/s- title		**contact**	
		contact	
2.3 Instruction held by- title	PhD. Marina Grabar Branilović, lecturer	**contact**	

3. COURSE DESCRIPTION

3.1 Course goals	The course will enable students to understand physical phenomena, laws and models, and after completing the course, students will be able to apply the basic laws of physics. Students will develop a scientific approach to solving physical problems.
3.2 Prerequisites	There are no conditions.
3.3 Course outcomes	After successfully completing the course, students will be able to: O1 - analyze the types of motion by integrating appropriate mathematical expressions into solving numerical problems O2 - distinguish and apply physical quantities in the field of heat and thermodynamics O3 - analyze circuits and the influence of electric field on magnetic field and vice versa O4 - explain wave motion O5 - understand and apply the laws of radiation and the law of radioactive decay
3.4 Course content	The course presents contents related to matter, motion, energy and interaction. The content is based on physical laws from the fields of mechanics, thermodynamics, statistical physics, electromagnetism, harmonic oscillation and waves, optics, atomic and quantum physics and nuclear physics.

3.5 Types of coursework

x	Lectures	x	Exercises		Blended e-learning	x	Individual activities		Laboratory
	Seminars and workshops	x	Distant learning		Field classes		Multimedia and network		Mentorship
	Other								

3.6 Language of instruction

Croatian

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)

2,0	Class attendance		Seminars		Essay
	Class activity		Project		Report/paper
3,0	Exams (Midterm exam, written and oral exam)		Practical task		Continuous knowledge check
			Experimental work	1,0	Homework
			Research		

3.8 Assessment and evaluation of students' work during classes and at the final exam

Activity specification	Percent %	Points
Assessment during instruction		
Attendance	10%	10
Class activity	10%	10
Midterm exam 1	35%	35
Midterm exam 2	35%	35
Oral exam	10%	10
Exam assessment for the students who failed to fullfil all the obligatory requirements during the semester		
Written exam	*60%*	*60*
Oral exam	*20%*	*20*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

Ways of evaluating learning outcomes						
	Attendance	**Activity**	**Mid-term exam 1**	**Mid-term exam 2**	**Oral exam**	**Total**
Outcome 1			20		2	22
Outcome 2			20		2	22
Outcome 3				20	2	22
Outcome 4				10	2	12
Outcome 5				10	2	12
Outcome not-related	5	5				10
Total	5	5	40	40		100

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

3.10 Specific features related with taking the course

In order for a student to pass the course, he must achieve a minimum of 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 individual learning outcomes, whereby the points won 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 did not take the colloquium take the written and oral part of the exam, where all learning outcomes are checked, and are required to submit all homework before taking the exam.	
3.11 Students obligations	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. 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.	
3.12 Written assignments		
3.13 Required reading	1.	P. Kulišić: Mehanika i toplina, Školska knjiga, 2011.
	2.	V. Henč-Bartolić, P. Kulišić: Valovi i optika, Školska knjiga, 1991
	3.	Eyvind H. Wichmann: Quantum Physics - Physics Textbook, University of Berkeley, Tehnička knjiga, 2003.
3.14 Additional reading	1.	Petar Kulišić i suradnici: Riješeni zadaci iz mehanike i topline, Školska knjiga,2011.
	2.	Young&Freedman: University Physics with Modern Physics, 2016.
	3.	J. D. Cutnell, K.W. Johnson, Physics, John Wiley and Sons; 9th edition, 2012.
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	Apply the acquired learning skills, basic knowledge of the profession and problem solving necessary for continuing studies at a higher level. Apply communication and professional ethics.

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	**Basics of electrical engineering and electronics**			
1.2 Study program/s	Undergraduate professional study of *Computer Science*			
1.3 Course status (O,E)	O	**1.6 Mode of instruction (number of hours)**	**Lectures**	30
1.4 Course code			**Exercises**	45
1.5 Course abbreviation	OEIE		**Seminars**	
1.6 Semester	I		**E-learning**	
1.7 ECTS	7	**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		**contact**	
		contact	
2.3 Instruction held by-title	Jurica Trstenjak/ senior lecturer	**contact**	jtrstenjak@mev.hr

3. COURSE DESCRIPTION

3.1 Course goals	The student should acquire a functional overview of the basic components of modern electronics, learn to use basic methods of analysis and evaluation of parameters of electrical circuits.
3.2 Prerequisites	No
3.3 Course outcomes	After successfully completing the course, students will be able to: O1 - Interpret basic phenomena in electrostatics O2 - Understand and apply Kirchhoff's laws and Ohm's law in the analysis of direct and alternating electric networks O3 - Analyze DC and AC networks using the following methods and theorems: node stress method, star-triangle transformation, superposition, transformation of real source models, Millman's, Thevenin's and Norton's theorem O4 - Analyze the basic phenomena in the magnetic field O5 - Explain the acquisition and operation of semiconductor elements (transistor as a switch)
3.4 Course content	

3.5 Types of coursework										
	x	Lectures	x	Exercises		Blended e-learning	x	Individual activities		Laboratory
		Seminars and workshops	x	Distant learning		Field classes		Multimedia and network		Mentorship
		Other								

3.6 Language of instruction	Croatian/English					
	2,5	Class attendance		Seminars		Essay

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)

	Class activity		Project		Report/paper
3,5	Exam (Midterm exams)		Practical task		Continuous knowledge check
	Written exam		Experimental work	1	Homework
	Oral exam		Research		

3.8 Assessment and evaluation of students' work during classes and at the final exam

Activity specification	Percent %	Points
Assessment during instruction		
Attendance	5%	5
Class activity	5%	5
Auditory exercises	15%	15
Oral part of midterms	15%	15
Midterm exam 1	30%	30
Midterm exam 2	30%	30
Exam assessment for the students who failed to fullfil all the obligatory requirements during the semester		
Written exam	*60%*	*60*
Oral exam	*10%*	*15*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

Ways of evaluating learning outcomes							
	Attendance	**Activity**	**Mid-term exam 1**	**Mid-term exam 2**	**Auditory exercises**	**Oral part of midterms**	**Total**
Outcome 1			10		2	3	15
Outcome 2			10		3	2	15
Outcome 3			10	20	8		38
Outcome 4				10	2	2	14
Outcome 5						8	8
Outcome not-related	5	5					10
Total	5	5	30	30	15	15	100

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

3.10 Specific features related with taking the course

In order for a student to pass the course, he / she must earn a minimum of 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 did not take the colloquium access the written and oral part of the exam where all learning outcomes are checked, and are required to submit a practical paper before taking the exam.	
3.11 Students obligations	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. 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.	
3.12 Written assignments		
3.13 Required reading	1.	M. A. Laughton D.F. Warne: Electrical Engineer's Reference Book, 16th Edition, Newnes, 2002.
	2.	
3.14 Additional reading	1.	
	2.	
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	Apply the acquired learning skills, basic knowledge of the profession and problem solving necessary for continuing studies at a higher level. Analyze the basic elements of electrical engineering and digital circuits and identify the structure of the computer.	

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	**Mathematics 1**			
1.2 Study program/s	Undergraduate professional study of Computer Science			
1.3 Course status (O,E)	O	**1.6 Mode of instruction (number of hours)**	**Lectures**	30
1.4 Course code			**Exercises**	45
1.5 Course abbreviation			**Seminars**	
1.6 Semester	1.		**E-learning**	
1.7 ECTS	7	**1.7 Place and time of instruction**	Polytechnic of Međimurje	

2. TEACHING STAFF

2.1 Course leader/s-title	Tibor Rodiger, senior lecturer	**contact**	trodiger@mev.hr
	MSc. Drago Franciškoviċ, senior lecturer	**contact**	dfranciskovic@mev.hr
2.2 Assistant/s- title		**contact**	
		contact	
2.3 Instruction held by- title	Tibor Rodiger, senior lecturer	**contact**	

3. COURSE DESCRIPTION

3.1 Course goals	The student should learn the chapters in mathematics necessary to solve engineering problems
3.2 Prerequisites	
3.3 Course outcomes	After successfully completing the course, students will be able to: I1 - Multiply, divide, potentiate and root complex numbers in trigonometric form I2 - Calculate expressions with matrices, determinant and vectors I3 - Solve the system of linear equations I4 - Develop an understanding of function definition, function composition and inverse function, classify functions and sketch graphs of basic functions without the help of derivations I5 - Understand the concept of limits, calculate the limits of a function I6 - Understand the concept of derivation, calculate the derivative of a function
3.4 Course content	

3.5 Types of coursework

x	Lectures	x	Exercises		Blended e-learning		Individual activities		Laboratory
	Seminars and workshops		Distant learning		Field classes		Multimedia and network		Mentorship
	Other								

3.6 Language of instruction	

3.7 Monitoring students' work (enter the

2.5	Class attendance		Seminars		Essay
1	Class activity		Project		Report/paper

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)

	Midterm exams		Practical task		Continuous knowledge check
2.5	Written exam		Experimental work		
1	Oral exam		Research		

3.8 Assessment and evaluation of students' work during classes and at the final exam

Activity specification	Percent %	Points
Assessment during instruction		
Attendance	3%	3
Class activity	10%	10
Seminar/ project/ essay	0%	0
Midterm exam 1	35%	35
Midterm exam 2	35%	35
Exam assessment for the students who failed to fullfil all the obligatory requirements during the semester		
Written exam	*70%*	*70*
Oral exam	*17%*	*17*
Total:	**100%**	**100**

Written exam

The written exam is taken through two colloquia,

Oral exam

A student has the right to publicity during the oral exam. An assistant or another student must be present in the room. Exam questions must be written down to determine if all outcomes have been verified. The oral exam is mainly used as an upgrade to the written one

3.9 Assessment criteria – analysis per learning outcomes

Ways of evaluating learning outcomes						
	Attendance	**Activity**	**Mid-term exam 1**	**Mid-term exam 2**	**Oral exam**	**Total**
Outcome 1			5		2	7
Outcome 2			20		4	24
Outcome 3			10		2	12
Outcome 4				10	3	13
Outcome 5				10	3	13
Outcome 6				15	3	18
Outcome not-related	3	10				13
Total	3	10	35	35	17	100

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

3.10 Specific features related with taking the course

If the student collects 40% of the points of each outcome and a total of 50% of the points from the colloquium, he directly takes the oral exam.

Once won points in colloquia 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 earned points for that learning outcome are entered.

	Students who did not take the colloquium access the written part of the exam where all learning outcomes are checked. Points for teaching activity are awarded in lectures and exercises, depending on the student's activity. The final grade is obtained in the oral part of the exam.	
3.11 Students obligations	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. 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.	
3.12 Written assignments		
3.13 Required reading	1.	**P. Javor: Uvod u matematičku analizu, Školska knjiga, Zagreb, 1993.**
	2.	**T. Rodiger: Derivacije – riješeni zadaci, MEV, Čakovec, 2015.**
3.14 Additional reading	1.	B. P. Deminovič i suradnici: Zadaci i riješeni primjeri iz Matematičke analize, Golden marketing –Tehnička knjiga, Zagreb, 2003
	2.	Ivan Slapničar: Matematika 1 i 2digitalni udžbenik s interaktivnim animacijama i interaktivnom provjerom znanja, http://www.fesb.hr/mat2.
	3.	T. Bradić, R. Roki, J. Pečarić, M. Strunje: Matematikazatehnološke fakultete, Element, Zagreb, 1998.
	4.	B.Kovačić, L.Marohnić, T.Strmečki: Repetitorij matematike za studente elektrotehnike, TVZ, Zagreb, 2014
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	Apply the acquired learning skills, basic knowledge of the profession and problem solving necessary for continuing studies at a higher level. Apply communication and professional ethics. Apply relevant mathematical and statistical methods in software engineering.

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	**Economics and organization of business systems**			
1.2 Study program/s				
1.3 Course status (O,E)	Compulsory Course	**1.6 Mode of instruction (number of hours)**	**Lectures**	30
1.4 Course code			**Exercises**	15
1.5 Course abbreviation	EIOPS		**Seminars**	
1.6 Semester	I.		**E-learning**	
1.7 ECTS	5	**1.7 Place and time of instruction**	Premises of Međimurje Polytechnic of Čakovec, according to schedule published on websites / distance learning as needed and possible	

2. TEACHING STAFF

2.1 Course leader/s-title	MSc. Ivan Hegeduš, senior lecturer	**contact**	ihegedus@mev.hr
		contact	
2.2 Assistant/s- title	Vesna Čanadi, associate	**contact**	vcanadi@mev.hr
		contact	
2.3 Instruction held by- title	MSc. Ivan Hegeduš, senior lecturer Vesna Čanadi, associate	**contact**	

3. COURSE DESCRIPTION

3.1 Course goals	Provide students with basic knowledge of economics. Acquire knowledge in the field of business organization and get acquainted with all the key elements for its construction
3.2 Prerequisites	There are no conditions.
3.3 Course outcomes	After successfully completing the course, students will be able to: I1 - Define basic economic concepts, formulate the meaning of organization and entrepreneurship and explain their interdependence. I2 - Analyze the elements of supply and demand and apply them in market analysis. I3 - Master the key elements for building an organization and successfully manage costs, challenges and changes in the organization. I4 - Define and evaluate the basic input elements of the business plan and create a business plan.
3.4 Course content	The course presents contents related to the basic economic concepts necessary for understanding the economy with an emphasis on market analysis using the supply and demand mechanism. In addition to economic elements, the teaching units present contents related to the organization as a complex system with a focus on entrepreneurship and business plan development

3.5 Types of coursework	

x	Lectures	x	Exercises	x	Blended e-learning	x	Individual activities		Laboratory
x	Seminars and workshops	x	Distant learning		Field classes	x	Multimedia and network		Mentorship
	Other								

3.6 Language of instruction	Croatian

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)

1,5	Class attendance	0.75	Seminars		Essay
0,75	Class activity		Project		Report/paper
	Midterm exams		Practical task		Continuous knowledge check
2	Written exam		Experimental work		
	Oral exam		Research		

3.8 Assessment and evaluation of students' work during classes and at the final exam

Activity specification	Percent %	Points
Assessment during instruction		
Attendance	5%	5
Class activity	5%	5
Seminar/ project/ essay	30%	30
Midterm exam 1	30%	30
Midterm exam 2	30%	30
Exam assessment for the students who failed to fullfil all the obligatory requirements during the semester		
Written exam	*60%*	*60*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

Ways of evaluating learning outcomes						
	Attendance	**Activity**	**Mid-term exam 1**	**Mid-term exam 2**	**Practical work**	**Total**
Outcome 1			10			10
Outcome 2			20			20
Outcome 3				15		15
Outcome 4				15	30	45
Outcome 5						
Outcome not-related	5	5				10
Total	5	5	30	30	30	100

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

3.10 Specific features related with taking the course

If a student collects 50% of the points of each outcome, he / she directly takes the exam, provided that he / she has submitted and presented a practical paper. A student cannot access the exam period if he / she has not submitted a practical paper. The practical work is made according to the instructions published on the Merlin system and is submitted by placing it on the Merlin.

	The practical work is submitted at least 3 days before the exam deadline. During the exam, it is possible to orally check the knowledge during the preparation of practical work. If a student does not achieve a sufficient number of points in the first colloquium, he cannot access the next second colloquium. Once earned points in colloquia for each learning outcome are no longer deleted unless the student decides to correct the result for a particular learning outcome, whereby the points won until then are deleted and newly earned 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 did not take the colloquium access the written part of the exam where all learning outcomes are checked, and are required to submit and present practical work before taking the exam.	
3.11 Students obligations	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. 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.	
3.12 Written assignments	Practical work according to the given instructions.	
3.13 Required reading	1.	Samuelson, P., A. and Nordhaus, D.W. Ekonomija, Zagreb: MATE, 19. izdanje
3.14 Additional reading	1.	Robbins S.P., Judge T.A.: Organizacijsko ponašanje, 2009.
	2.	Sikavica, P.: Organizacija, Školska knjiga, 2011.
	3.	Mankiw, G. (2004.) *Osnove ekonomije*, Zagreb: Mate
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	Work in a team, manage professional projects and cooperate with experts from the real sector. Apply communication and professional ethics.

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	English Language 2			
1.2 Study program/s	Undergraduate professional study in Computer Science			
1.3 Course status (O,E)	O	**1.6 Mode of instruction (number of hours)**	**Lectures**	15
1.4 Course code			**Exercises**	45
1.5 Course abbreviation	EJ2		**Seminars**	
1.6 Semester	2		**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 timetable published on the website	

2. TEACHING STAFF

2.1 Course leader/s-title	Marija Miščančuk, senior lecturer	**contact**	mmiscancuk@mev.hr
	Martina Sobočan, senior lecturer	**contact**	msobocan@mev.hr
2.2 Assistant/s- title		**contact**	
2.3 Instruction held by-title	Marija Miščančuk, senior lecturer Jurica Vugrin, associate	**contact**	jurica.vugrin@mev.hr

3. COURSE DESCRIPTION

3.1 Course goals	After completing the course, the student will be able to use English through all four language skills in the context of the profession.
3.2 Prerequisites	Passed English Language 1
3.3 Course outcomes	After successfully completing the course, students will be able to: I1 - Analyse the grammatical structures of the English language so that they can be applied in everyday situations I2 - Use basic terms related to professional vocabulary in professional texts in English I3 – Create a written work including appropriate vocabulary and grammatical structures I4 - Design an oral presentation on a specific topic in Englishx
3.4 Course content	The course consists of a section in which students are introduced to the basic components of business English. They are also introduced to the basic grammatical structures necessary for communication in the above context in English, as well as the basics of culture and civilization of the English-speaking countries.

3.5 Types of coursework

x	Lectures	x	Exercises		Blended e-learning	x	Individual activities		Laboratory
x	Seminars and workshops		Distant learning		Field classes		Multimedia and network		Mentorship
	Other								

3.6 Language of instruction	Croatian/English

	0.5	Class attendance	1	Seminars		Essay

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)

0.5	Class activity		Project		Report/paper
1	Midterm exams		Practical task		Continuous knowledge check
	Written exam		Experimental work		
1	Oral exam		Research		

3.8 Assessment and evaluation of students' work during classes and at the final exam

Activity specification	Percent %	Points
Assessment during instruction		
Attendance	5%	5
Seminar/ project/ essay	15%	15
Presentation	10%	10
Midterm exam 1	30%	30
Midterm exam 2	30%	30
Exam assessment for the students who failed to fullfil all the obligatory requirements during the semester		
Written exam	*90%*	*90*
Oral exam	*10%*	*10*
Total:	**100%**	**100**

Written exam

The written exam is taken through two midterm exams, a seminar and a presentation, or a final written exam.

Oral exam

An assistant or another student must be present in the room during the oral exam. Exam questions must be written down to determine if all outcomes have been verified. The oral exam is mainly used as an upgrade to the written one, only exceptionally as the only form of knowledge assessment.

3.9 Assessment criteria – analysis per learning outcomes

	Ways of evaluating learning outcomes					
	Attendance	**Class activity**	**Mid-term exam 1**	**Mid-term exam 2**	**Seminar paper**	**Prezentation**
Outcome 1			15	15		
Outcome 2			15	15		
Outcome 3					15	
Outcome 4						10
Outcome not-related	5	10	30	30	15	10

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

3.10 Specific features related with taking the course	In the semester, students will write 2 midterm exams, write a seminar on a specific given topic and give a presentation on the same topic. The 1st midterm exam is written after the first 7 weeks of classes and covers the learning outcomes covered in the first 7 weeks. The 2nd midterm exam is written after the other 7 weeks of classes and covers the learning outcomes covered in the other 7 weeks of classes. Midterm exams are taken during the teaching period in the 1st week after each cycle of 7 weeks of teaching. The type of questions is defined by the teacher, but all questions and tasks cover the course material or learning outcomes. The topic of the seminar is determined by the teacher in cooperation with the student, and the date of the seminar is defined. After the submission of the seminar, the date of the presentation is determined. A student who does not take any of the intermediate exams or does not submit a seminar or give a presentation has not met the conditions for exemption from the written exam and must take the written exam, followed by an oral exam. The final grade is obtained in the oral part of the exam. If the student collects 50% of the points of each outcome, he / she directly takes the oral exam. If a student does not achieve a sufficient number of points on the midterm exam, he / she cannot take the next midterm exam. Once won points in midterm exams for each learning outcome are no longer deleted unless the student decides to correct the result for a particular learning outcome, whereby the points won until then are deleted and newly earned points are entered for that learning outcome.	
3.11 Students obligations	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. 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.	
3.12 Written assignments	Seminar papers must be computer written and may have a maximum of 12 text cards (Times New Roman, font 12) from introduction to conclusion, together with pictures, appendices, tables, etc. Seminar papers must have an adequate title page, content, marked pages and literature. The seminar paper should be divided into chapters and contain a list of references and a list of figures and tables and graphs and finally a summary / conclusion in the size of 250 words. The student guarantees the authenticity of the work with his signature.	
3.13 Required reading	1.	S.R. Esteras: Infotech English for computer users, CUP, 2008
	2.	R. Murphy: Grammar in Use, Cambridge University Press, Third Edition 2007
3.14 Additional reading	1.	E.H. Glesdinning, J. Mc Ewan: Oxford English for Information Technology, Oxford University Press, 2002
	2.	S.R. Esteras, E.M. Fabre: ICT, Professional English in Use, CUP, 2007
	3.	Advanced Oxford Dictionary
	4.	
	5.	
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	IS 1Apply the acquired learning skills, basic knowledge of the profession and problem solving necessary for continuing studies at a higher level. IS2 Use English in the appropriate domain in communication with professionals and lay people.

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	**Digital electronic circuits**			
1.2 Study program/s	Undergraduate professional study of Computer Science			
1.3 Course status (O,E)	O	**1.6 Mode of instruction (number of hours)**	**Lectures**	30
1.4 Course code	DES		**Exercises**	45
1.5 Course abbreviation	5007		**Seminars**	
1.6 Semester	II		**E-learning**	
1.7 ECTS	6	**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		**contact**	
		contact	
2.3 Instruction held by- title	Jurica Trstenjak/ senior lecturer	**contact**	jtrstenjak@mev.hr

3. COURSE DESCRIPTION

3.1 Course goals	Student should acquire a functional overview of the basic components of modern digital electronic circuits, learn the basics of digital technique, logical algebra and the realization of more complex logical functions.
3.2 Prerequisites	It is necessary to have passed the subject Basics of Electrical Engineering and Electronics
3.3 Course outcomes	After successfully completing the course, students will be able to: O1 - Use different number systems and codes O2 - Apply minimization of logic functions and basic logic circuits O3 - Explain the operation of basic types of bistables O4 - explain the operation of basic combinational and arithmetic circuits O5 - use combinational circuits, registers and counters in the design of synchronous sequential circuits O6 - explain AD and DA conversion
3.4 Course content	Number systems. Codes. Logic circuits. Integrated circuits. Multivibrators. Minimization. Registers. Counters. Sequential circuits. Memories. A/D and D/A conversion.

3.5 Types of coursework

x	Lectures	x	Exercises		Blended e-learning	x	Individual activities		Laboratory
	Seminars and workshops	x	Distant learning		Field classes	x	Multimedia and network		Mentorship
	Other							

3.6 Language of instruction	Croatian/English

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)

2,5	Class attendance		Seminars		Essay
	Class activity		Project		Report/paper
3	Exam (Midterm exams)	0,5	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

Activity specification	Percent %	Points
Assessment during instruction		
Attendance	5%	5
Class activity	5%	5
Oral part of midterms	15%	15
Midterm exam 1	20%	20
Midterm exam 2	20%	20
Midterm exam 3	20%	20
Practical task	15%	15
Exam assessment for the students who failed to fullfil all the obligatory requirements during the semester		
Written exam	*60%*	*60*
Oral exam	*15%*	*15*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

	Način polaganja ishoda							
	Attendance	**Class activity**	**Midterm exam 1**	**Midterm exam 2**	**Midterm exam 3**	**Practical task**	**Oral part of midterms**	**Total**
Outcome 1			10			2	2	14
Outcome 2			10			2	2	14
Outcome 3				10		3	3	16
Outcome 4				10		2	2	14
Outcome 5					10	3	3	16
Outcome 6					10	3	3	16
Outcome not-related	5	5						10
Total	**5**	**5**	**20**	**20**	**20**	**15**	**15**	**100**

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

3.10 Specific features related with taking the course

In order for a student to pass the course, he / she must earn a minimum of 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) or the 2nd midterm exam, 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 did not take the colloquium take the written and oral part of the exam, where all learning outcomes are checked, and are required to submit all homework before taking the exam.	
3.11 Students obligations	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. 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.	
3.12 Written assignments		
3.13 Required reading	1.	Anil K. Maini: Digital Electronics: Principles, Devices and Applications 1st Edition, Wiley, West Sussex, 2007.
	2.	
3.14 Additional reading	1.	
	2.	
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	Apply the acquired learning skills, basic knowledge of the profession and problem solving necessary for continuing studies at a higher level. Analyze the basic elements of electrical engineering and digital circuits and identify the structure of the computer.	

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	**Programming**			
1.2 Study program/s	Undergraduate professional study Sustainable Development			
1.3 Course status (O,E)	Obligatory	**1.6 Mode of instruction (number of hours)**	**Lectures**	30
1.4 Course code			**Exercises**	45
1.5 Course abbreviation	PROG		**Seminars**	
1.6 Semester	2		**E-learning**	
1.7 ECTS	7	**1.7 Place and time of instruction**	The premises of Polytechnic of Medjimurje in Cakovec, according to schedule published on web pages	

2. TEACHING STAFF

2.1 Course leader/s-title	PhD, Bruno Trstenjak, Senior lecturer, PhD, Sanja Brekalo, High School Professor	**contact**	btrstenjak@mev.hr sbrekalo@mev.hr
		contact	
2.2 Assistant/s- title		**contact**	
		contact	
2.3 Instruction held by- title	PhD, Bruno Trstenjak, Senior lecturer, PhD, Sanja Brekalo, High School Professor	**contact**	

3. COURSE DESCRIPTION

3.1 Course goals	After completing the course, the student will be able to apply a structured procedural programming language for solving simple programming problems and create a simple application using computer algorithms. Knowledge in the field of computer programming is acquired, the student enables to independently perform program tasks.
3.2 Prerequisites	None.
3.3 Course outcomes	After successfully completing the course, students will be able to: O1 - Define the variables and data types depending on the terms of reference O2 - Use the basic commands of the program structure depending on the requirements of the program tasks O3 - Apply various data structures in applications O4 - Use functional structures in the development of more complex applications and independently develop a software algorithm for solving problem tasks O5 - Create simple applications or functions based on the application of procedural programming language
3.4 Course content	The course presents content related to the development of desktop applications using a procedural language such as C ++ or Java. Emphasis on the application logic program structure, different data structures and the development of algorithms for solving simple programming tasks. In teaching units and exercises,s the contents of the lectures are supported by implemented algorithms and solved tasks, both in lectures and in exercises.

3.5 Types of coursework

X	Lectures	X	Exercises		Blended e-learning	X	Individual activities		Laboratory
	Seminars and workshops	X	Distant learning		Field classes		Multimedia and network		Mentorship
	Other								

3.6 Language of instruction

Croatian/English

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)

2,50	Class attendance	0,5	Seminars		Essay
	Class activity		Project		Report/paper
3,0	Midterm exams		Practical task		Continuous knowledge check
	Written exam		Experimental work		
1,0	Oral exam		Research		

3.8 Assessment and evaluation of students' work during classes and at the final exam

Activity specification	Percent %	Points
Assessment during instruction		
Attendance	5%	5
Continuous assessment	20%	20
Seminar/ project/ essay	5%	5
Midterm exam 1	15%	15
Midterm exam 2	15%	15
Midterm exam 3	15%	15
Oral exam	25%	25
Exam assessment for the students who failed to fullfil all the obligatory requirements during the semester		
Written exam	*45%*	*45*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

	Ways of evaluating learning outcomes							
	Attendance	**Continuous asse.**	**Mid-term exam 1**	**Mid-term exam 2**	**Mid-term exam 3**	**Seminar**	**Oral exam**	**Total**
Outcome 1			5				5	10
Outcome 2		5	10	5			5	25
Outcome 3		5		10			5	20
Outcome 4		5			5		5	15
Outcome 5		5			10		5	20
Outcome not-related	5					5		10
Total	**5**	**20**	**15**	**15**	**15**	**5**	**25**	**100**

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

3.10 Specific features related with taking the course	If a student collects 50% of the points of each outcome, he / she directly takes the exam, if he / she has submitted a seminar paper. A student cannot access the exam if he / she has not submitted a seminar paper. Seminar papers are prepared according to the instructions published on the Merlin system and are submitted by posting on the Merlin. The seminar paper should be submitted at least 3 days before the exam deadline.	
3.11 Students obligations	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. 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.	
3.12 Written assignments		
3.13 Required reading	1.	
	2.	
3.14 Additional reading		
	1.	Liam Damien : C++: Step by step Beginners Guide in Mastering C++, Independently published, 2019
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	- Develop programming code in multiple programming languages using modern methods and tools - Choose ways of structuring data in program code, as well as techniques for writing complex program forms and use standard algorithms

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	**Mathematics 2**			
1.2 Study program/s	Undergraduate professional study of Computer Science			
1.3 Course status (O,E)	O	**1.6 Mode of instruction (number of hours)**	**Lectures**	30
1.4 Course code			**Exercises**	45
1.5 Course abbreviation			**Seminars**	
1.6 Semester	2.		**E-learning**	
1.7 ECTS	7	**1.7 Place and time of instruction**	Polytechnic of Međimurje	

2. TEACHING STAFF

2.1 Course leader/s-title	Tibor Rodiger, senior lecturer	**contact**	trodiger@mev.hr
	MSc. Drago Franciškoviċ, senior lecturer	**contact**	dfranciskovic@mev.hr
2.2 Assistant/s- title		**contact**	
		contact	
2.3 Instruction held by- title	Tibor Rodiger, senior lecturer	**contact**	

3. COURSE DESCRIPTION

3.1 Course goals	The student should learn the chapters in mathematics necessary to solve engineering problems
3.2 Prerequisites	Prerequisite for enrollment: course Mathematics 1 Prerequisite for passing: passed course Mathematics 1
3.3 Course outcomes	After successfully completing the course, students will be able to: I1 - Derive implicitly given functions I2 - Apply tangent derivation techniques, angle between curves, L'Hospital rule I3 - Examine the course of a function and draw a graph using monotonicity, convexity, extremes and asymptotes I4 - Calculate indefinite and definite integral I5 - Apply integration to surface, curve arc length and rotating body volume I6 - Solve differential equations
3.4 Course content	

3.5 Types of coursework

x	Lectures	x	Exercises		Blended e-learning		Individual activities		Laboratory
	Seminars and workshops		Distant learning		Field classes		Multimedia and network		Mentorship
	Other								

3.6 Language of instruction	

3.7 Monitoring students' work (enter the

2.5	Class attendance		Seminars		Essay
1	Class activity		Project		Report/paper

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)

	Midterm exams		Practical task		Continuous knowledge check
2.5	Written exam		Experimental work		
1	Oral exam		Research		

3.8 Assessment and evaluation of students' work during classes and at the final exam

Activity specification	Percent %	Points
Assessment during instruction		
Attendance	3%	3
Class activity	10%	10
Seminar/ project/ essay	0%	0
Midterm exam 1	35%	35
Midterm exam 2	35%	35
Exam assessment for the students who failed to fullfil all the obligatory requirements during the semester		
Written exam	*70%*	*70*
Oral exam	*17%*	*17*
Total:	**100%**	**100**

Written exam

The written exam is taken through two colloquia,

Oral exam

A student has the right to publicity during the oral exam. An assistant or another student must be present in the room. Exam questions must be written down to determine if all outcomes have been verified. The oral exam is mainly used as an upgrade to the written one

3.9 Assessment criteria – analysis per learning outcomes

Ways of evaluating learning outcomes						
	Attendance	**Activity**	**Mid-term exam 1**	**Mid-term exam 2**	**Oral exam**	**Total**
Outcome 1			5		2	7
Outcome 2			20		4	24
Outcome 3			10		2	12
Outcome 4				10	3	13
Outcome 5				10	3	13
Outcome 6				15	3	18
Outcome not-related	3	10				13
Total	3	10	35	35	17	100

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

3.10 Specific features related with taking the course

If the student collects 40% of the points of each outcome and a total of 50% of the points from the colloquium, he directly takes the oral exam.

Once won points in colloquia 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 earned points for that learning outcome are entered.

	Students who did not take the colloquium access the written part of the exam where all learning outcomes are checked. Points for teaching activity are awarded in lectures and exercises, depending on the student's activity. The final grade is obtained in the oral part of the exam.	
3.11 Students obligations	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. 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.	
3.12 Written assignments		
3.13 Required reading	1.	**P. Javor: Uvod u matematičku analizu, Školska knjiga, Zagreb, 1993.**
	2.	**T. Rodiger: Derivacije – riješeni zadaci, MEV, Čakovec, 2015.**
3.14 Additional reading	1.	B. P. Deminovič i suradnici: Zadaci i riješeni primjeri iz Matematičke analize, Golden marketing –Tehnička knjiga, Zagreb, 2003
	2.	Ivan Slapničar: Matematika 1 i 2digitalni udžbenik s interaktivnim animacijama i interaktivnom provjerom znanja, http://www.fesb.hr/mat2.
	3.	T. Bradić, R. Roki, J. Pečarić, M. Strunje: Matematikazatehnološke fakultete, Element, Zagreb, 1998.
	4.	B.Kovačić, L.Marohnić, T.Strmečki: Repetitorij matematike za studente elektrotehnike, TVZ, Zagreb, 2014
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	Apply the acquired learning skills, basic knowledge of the profession and problem solving necessary for continuing studies at a higher level. Apply communication and professional ethics.

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	Computer application			
1.2 Study program/s	Undergraduate professional studies Computer science			
1.3 Course status (O,E)	A	**1.6. Method of teaching (number of hours)**	**Lectures**	15
1.4 Course code			**Exercise**	60
1.5 Course abbreviation	Pr		**Seminar**	-
1.6 Semester	II.		**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	Nenad Breslauer, senior lecturer	**Contact**	nbreslauer1@mev.hr
		Contact	
2.2 Assistant/s- title		**Contact**	
		Contact	
2.3 Instruction held by-title		**Contact**	

3. COURSE DESCRIPTION

3.1 Course goals	After the course is listened, the student will understand the basic parts of the computer and computer components, their materialand application. The student should know computer and software equipment, operating systems and the basics of internet use. After successfully completing the course, Studen will be able to work in text editors and processors, table calculators, programming tools for drafting and preparing, images and presentations. It has a sufficiently broad knowledge that enables the rapid application of new technologies but also its application in other subjects of the study.
3.2 Prerequisites	There are no conditions. The Application of Computer Program is used to support further work in the profession.
3.3 Course outcomes	After a successfully mastered course, students will be able to: I1 - Describe the basic concepts in the field of informatics. I2 - Recognize the characteristics of embedded components and peripherals. I3 - Create complex documents for a wide range of office tasks using office complex word processing tools. I4 - Combine different possibilities of spreadsheet and presentation program in order to accomplish complex project tasks. I5 - Combine the possibilities provided by the Internet to achieve the desired goals. I6 - Selection of the most efficient software solution in the realization of the project task, planning the execution and writing of program code according to the given case.

3.4 Course content

The course provides content related to historical computer development, basic terms in informatics, Hardware, Software, Computer Mode, Computer Build, Operating Systems, and MS Office Tools.

3.5 Types of coursework

X	Lectures	X	Exercises		Blended e-learning	X	Individual activities		Laboratory
x	Seminars and workshops		Distant learning		Field classes		Multimedia and network		Mentorship
	Other								

3.6 Language of instruction

Croatian

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	1	Seminars		Essay
	Class activity		Project		Report/paper
1	Midterm exams	1	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

Activity Specification	Percentage %	Score
Evaluation during class		
Presence in class	5%	5
Activity in Class	5%	5
Colloquium 1	35%	35
Colloquium 2	35%	35
Colloquium 3	20%	20
Evaluation of exam work for students who did not co-late		
Written exam	*60%*	*60*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

Ways of evaluating learning outcomes						
	Attendance	**Activity**	**Mid-term exam 1**	**Mid-term exam 2**	**Mid-term exam 2**	**Total**
Outcome 1			5			10
Outcome 2			5	10		15
Outcome 3			10	10		15
Outcome 4			15			15
Outcome 5				15		15
Outcome not-related					20	20
Total	5	5				10
	5	**5**	**35**	**35**	**20**	**100**

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

3.10 Specific features related with taking the course	If the student collects 50% of the points of each outcome directly access orally exam. If a student does not achieve a sufficient number of points on the midterm exam, he cannot take the next midterm exam. Once won 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. A student cannot access the exam period if he / she has not submitted and presented seminar paper. The final grade is obtained on the oral part of the exam. 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. 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.	
3.11 Students obligations	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. Attendance can be offset by online consultations, organized 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 the event that a student is absent from more than 50% of classes, and has a justifiable reason / apology, a 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.	
3.12 Written assignments	Seminar papers must be computer written and may have a maximum of 12 text cards (Times New Roman, font 12) from introduction to conclusion, together with pictures, table appendices, etc. Seminar papers must have an adequate title page, content, marked pages and literature. The seminar paper should be divided into chapters and contain a list of references and a list of figures and tables and graphs and finally a summary / conclusion in the size of 250 words. The student guarantees the authenticity of the work with his signature.	
3.13 Required reading	1.	Ž. Panian, I. Strugar, Application of computers in business practice, 2. Synergy,Zagreb, 2004.
	2.	Nenad Breslauer: Computer Training Script Application in Business Practice
	3.	
3.14 Additional reading	1.	Materials on the e-learning system (moodle.srce.hr)
	2.	GRUNDLER, D. Applied Computing
	3.	
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	Apply the acquired learning skills, basic knowledge of the profession and problem solving necessary for continuing studies at a higher level. Use English in the domain of ICT in communication with experts and lay people. Identify trends in ICT technologies in the domestic and international market. Apply communication and professional ethics. Identify the basic specifics of operating systems. Distinguish types and communication protocols of computer networks.

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION				
1.1 Course name	**COMMUNICATION SKILLS**			
1.2 Study program/s	Undergraduate professional study of *Computer Science*			
1.3 Course status (O,E)	O	**1.6 Mode of instruction (number of hours)**	**Lectures**	30
1.4 Course code			**Exercises**	45
1.5 Course abbreviation			**Seminars**	0
1.6 Semester	III		**E-learning**	0
1.7 ECTS	5	**1.7 Place and time of instruction**	Premises of Međimurje Polytechnic of Čakovec, according to schedule published on website	
2. TEACHING STAFF				
2.1 Course leader/s-title	Irena Popović, lecturer	**contact**	ipopovic@mev.hr	
		contact		
2.2 Assistant/s- title		**contact**		
		contact		
2.3 Instruction held by- title	Irena Popović, lecturer	**contact**		
3. COURSE DESCRIPTION				
3.1 Course goals	Awareness and understanding of the basics of successful communication and adoption of techniques and skills needed for successful communication with individuals, in the group and with the audience.			
3.2 Prerequisites	Introducing students to the overall theoretical content of the course in the field of quality, proactive business communication skills. Enabling students to understand the importance of communication skills. Mastering theoretical, practical and experiential knowledge of communication skills.			
3.3 Course outcomes	1. Distinguish basic communication concepts (basic characteristics, laws and dynamics) and their practical application. Forms of communication. 2. Understanding and overcoming conflict, crisis situations. 3. Effective, proactive and assertive communication through active listening. 4. Nonverbal and verbal communication skills.			
3.4 Course content	1. What is communication: types, goals, principles of the communication process. 2. The nature of interpersonal communication. The importance of communication for interpersonal relationships. 3. Obstacles to successful communication: conflicts and conflicts 4. Communication competence: skills of successful communication with an individual and communication in a small group 5. Assertiveness in communication.0,			

6. Debate: discussion
7. Conversation.
8. Presentation skills and presentation skills during the presentation.
9. Active listening: critical listening and asking questions to the speaker.
10. Obstacles to successful communication.
11. Empathic understanding.
12. The importance of nonverbal and verbal communication.
13. Speaking in front of an audience. Different purposes and appropriate forms of addressing the audience.
14. Communication in a team.
15. Innovative communication

3.5 Types of coursework

x	Lectures	x	Exercises		Blended e-learning		Individual activities		Laboratory
	Seminars and workshops	x	Distant learning	x	Field classes		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)

1,5	Class attendance	0,5	Seminars	0	Essay
0	Class activity	0	Project	0	Report/paper
1	Midterm exams	0	Practical task	0	Continuous knowledge check
0	Written exam		Experimental work		
1	Oral exam	0	Research		

3.8 Assessment and evaluation of students' work during classes and at the final exam

Activity specification	Percent %	Points
Assessment during instruction		
Attendance	5%	5
Class activity	5%	5
Seminar/ project/ essay	30%	30
Midterm exam 1	30%	30
Midterm exam 2	30%	30
Exam assessment for the students who failed to fullfil all the obligatory requirements during the semester		
Written exam	*60%*	*60*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

Ways of evaluating learning outcomes						
	Attendance	**Activity**	**Mid-term exam 1**	**Mid-term exam 2**	**Practical work**	**Total**
Outcome 1			10	10	5	25
Outcome 2			10	10	5	25
Outcome 3			10	10	5	25
Outcome 4			5	5	5	15
Outcome 5	5	5				10
Outcome not-related	**5**	**5**	**35**	**35**	**20**	**100**
Total			10	10	5	25

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)
Points Grade

	89 – 100 excellent (5) 76 – 88 very good (4) 63 – 75 good (3) 50 – 62 pass (2) 0 – 49 fail (1)
3.10 Specific features related with taking the course	Pass the exam consisting of a written and an oral part. The written part refers to the material - skills, attitudes and behaviors that they became aware of during classes, and the oral part of the exam refers to the examination of the studied literature. The exam can be abstracted through colloquia. b) Prepare a seminar paper
3.11 Students obligations	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. 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.
3.12 Written assignments	1**. Technical requirements** The seminar paper should contain a minimum of 8 text cards (without literature and title page). The card indicates a norm of 1800 characters, including spaces. It is mandatory to use one of the standard fonts (Arial or Times New Roman), and a size of 12pt. The spacing between lines of text must be 1.5. Any changes to text density and standard margins are not allowed. The distance between the title and the text can be slightly larger than the mentioned line spacing (of 1.5) to make the title stand out from the rest of the text. It is desirable to highlight titles and subtitles, with a slightly larger font (eg 14pt) or bold (or both). The text needs to be edited or moved on both sides (justify function in MS Word; ctrl + j); PPT. **2. The structure of the written seminar** The seminar is based on the knowledge gained as part of group work, consulting the literature and data obtained from research. The seminar therefore represents the final synthesis of the work in the theoretical and empirical field. The seminar consists of an introduction, a central part and a conclusion. The introduction should include an introduction to the problem or topic, and a brief overview of the seminar chapter. The central part should deal with basic problems from the literature. It may or may not have the same structure as the literature being processed (the titles of the chapters and subchapters may differ, but the main idea must be clearly visible and credibly conveyed). In conclusion, it is desirable that in addition to the conclusion found in the literature, the student tries to give his view of the problem, through a different reflection on the text or its connection with any of the other seminar topics. Apart from the mentioned units (introduction, central part and conclusion), writing is also organized in several smaller thematic-logical units. These are

	chapters, subchapters and paragraphs. In the proper writing of seminars, care should be taken about their sequence and content. **3. Use of literature, citations and bibliography** Literature is selected depending on the topic and is given. In the case of a group seminar, students will also receive basic literature that must be adhered to (but they can also supplement it according to their own interests). Citation means downloading parts of the author's text. Quotations are given in the form of footnotes, at the bottom of the page in the form: author, year, page. All downloaded parts of a text must be indicated. A literal download is indicated by a citation and placed in quotation marks ('') followed by a footnote. Paraphrasing or retelling the text is not enclosed in quotation marks but is also marked with a footnote. This form can also be used by mentioning the author in the text and a footnote. The download of ideas or phrases must also be indicated as already stated. Bibliography, ie literature, is cited at the end of the paper. Depending on the type of source, APA citation standards are used. **4. Plagiarism** Plagiarism is "the taking over of someone else's ideas, actions, results or text without citing the source in order to present the taken over as one's own work" (Baždarić et.al. 2009: Medicina Fluminensis (45), 2: 109). Seminar paper containing elements of plagiarism will not be accepted and the violator will be sanctioned. Repeated submission of plagiarized work (for example, intentional non-citation after a warning) will be considered a knowingly and intentional breach of obligations in accordance with academic ethical principles.	
3.13 Required reading	1.	Pearson, J. C., Spitzberg, B. H. (1990). *Interpersonal communication: concepts, components and contexts.* Dubuque: Wm. C. Brown Publishers.
	2.	
3.14 Additional reading	1.	
	2.	
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	Apply the acquired learning skills, basic knowledge of the profession and problem solving necessary for continuing studies at a higher level. Work in a team, manage professional projects and cooperate with experts from the real sector.

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	**Algorithms and data structures**			
1.2 Study program/s	Undergraduate professional study in Computer Science			
1.3 Course status (O,E)	Obligatory	**1.6 Mode of instruction (number of hours)**	**Lectures**	30
1.4 Course code			**Exercises**	45
1.5 Course abbreviation			**Seminars**	
1.6 Semester	3		**E-learning**	
1.7 ECTS	7	**1.7 Place and time of instruction**	The premises of Polytechnic of Medjimurje in Cakovec, according to schedule published on web pages	

2. TEACHING STAFF

2.1 Course leader/s-title	PhD. Bruno Trstenjak, senior lecturer Miran Kovačić, lecturer	**contact**	btrstenjak@mev.hr mkovacic@mev.hr
		contact	
2.2 Assistant/s- title		**contact**	
		contact	
2.3 Instruction held by- title	Miran Kovačić, lecturer	**contact**	

3. COURSE DESCRIPTION

3.1 Course goals	After completing the course, the student will be able to apply different data structures using different program algorithms. The student will be able to apply the acquired knowledge in the field of data structures and algorithms in the independent execution of program tasks.
3.2 Prerequisites	Passed courses: Programming, Mathematics 1
3.3 Course outcomes	After successfully completing the course, students will be able to: O1 - Explain the basic properties and characteristics of different data structures O2 - Explain how different simple and advanced programming algorithms work and recognize the complexity of the algorithm O3 - Make an analysis of the efficiency of individual algorithms in solving problem tasks O4 - Apply various data structures and algorithms in solving problem tasks O5 - Identify appropriate data structures and algorithms in solving specific problems
3.4 Course content	The content of the course continues the acquired knowledge from the course in the course Programming. The most widely used algorithms and data structures are processed. After dynamic memory allocation, memory allocation examples, and function call mechanism, the notion of algorithm complexity is introduced. Recursion is explained and illustrated. The search techniques are continued and then all the important sorting algorithms follow. Dynamic data structures are introduced: single and multiple linked lists. Basic data structures such as hence and order are built. Then the diffuse addressing technique, binary trees and binary search tree are introduced. Application of data compression algorithms and search of character and numeric data strings.

3.5 Types of coursework

X	Lectures	X	Exercises		Blended e-learning	X	Individual activities		Laboratory
	Seminars and workshops	X	Distant learning		Field classes		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)

2,5	Class attendance	0,5	Seminars		Essay
	Class activity		Project		Report/paper
3,0	Midterm exams		Practical task		Continuous knowledge check
	Written exam		Experimental work		
1,0	Oral exam		Research		

3.8 Assessment and evaluation of students' work during classes and at the final exam

Activity specification	Percent %	Points
Assessment during instruction		
Attendance	5%	5
Continuous assessment	20%	20
Seminar/ project/ essay	5%	5
Midterm exam 1	15%	15
Midterm exam 2	15%	15
Midterm exam 3	15%	15
Oral exam	25%	25
Exam assessment for the students who failed to fullfil all the obligatory requirements during the semester		
Written exam	*45%*	*45*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

Ways of evaluating learning outcomes								
	Attendance	**Continuous asse.**	**Mid-term exam 1**	**Mid-term exam 2**	**Mid-term exam 3**	**Seminar**	**Oral exam**	**Total**
Outcome 1			5				5	10
Outcome 2		5	10	5			5	25
Outcome 3		5		10			5	20
Outcome 4		5			5		5	15
Outcome 5		5			10		5	20
Outcome not-related	5					5		10
Total	5	20	15	15	15	5	25	100

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

3.10 Specific features related with taking the course

If a student collects 50% of the points of each outcome, he / she directly takes the exam, if he / she has submitted a seminar paper. A student cannot access the exam if he / she has not submitted a seminar paper. Seminar papers are

	prepared according to the instructions published on the Merlin system and are submitted by posting on the Merlin. The seminar paper should be submitted at least 3 days before the exam deadline.	
3.11 Students obligations	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. 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.	
3.12 Written assignments		
3.13 Required reading	1.	Dr. Clifford A. Shaffer: Data Structures and Algorithm Analysis in C++,Dover Publications, 2011.
	2.	
3.14 Additional reading	1.	Henry H Liu: Algorithms with Implementations in C: A Quantitative Approach, Independently published, 2019.
	2.	Adam Drozdek: Data Structure and Algorithm in C++, Cengage Learning India, 2013.
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	- Develop programming code in multiple programming languages using modern methods and tools - Choose ways of structuring data in program code, as well as techniques for writing complex program forms and use standard algorithms

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	**Probability and Statistics**			
1.2 Study program/s	Undergraduate professional study of Computer Science			
1.3 Course status (O,E)	O - obligatory	**1.6 Mode of instruction (number of hours)**	**Lectures**	30
1.4 Course code			**Exercises**	30
1.5 Course abbreviation	ViS		**Seminars**	
1.6 Semester	III.		**E-learning**	
1.7 ECTS	6	**1.7 Place and time of instruction**	Lecture halls of the Polytechnic of Međimurje in Čakovec, according to the class schedule published on the website	

2. TEACHING STAFF

2.1 Course leader/s- title	MSc. Drago Franciškovi, senior lecturer Tibor Rodiger, senior lecturer	**contact**	drago.franciskovic@mev.hr trodiger@mev.hr
		contact	
2.2 Assistant/s- title		**contact**	
		contact	
2.3 Instruction held by-title	MSc. Drago Franciškovi, Senior Lecturer	**contact**	drago.franciskovic@mev.hr

3. COURSE DESCRIPTION

3.1 Course goals	Introduce students to the basic concepts of descriptive statistics, probabilities and statistical methods and tests. To enable students to use basic methods of descriptive statistics, regression analysis and to demonstrate the application of statistical tests. Encourage students to think, and train them to use the acquired knowledge in other subjects with the use of computers. Raise the general level of mathematical literacy and encourage students to orderliness, accuracy and systematics in problem solving and in written and oral expression.
3.2 Prerequisites	Passed exam Mathematics I, passed Mathematics II.
3.3 Course outcomes	1. Apply methods of descriptive statistics (understand and create a table of frequencies; graphically display data; determine environmental measures and scatter measures). R5 2. Apply regression and correlation analysis and draw a conclusion (linear regression). R6 3. Explain the concept of events and the definition of probability, and apply the acquired knowledge and skills in determining the probability of events in various situations. R6 4. Explain the concept of a random variable and functions related to them, and apply various distribution functions and probability functions of a random variable. R6

	5. Apply some statistical tests. R5
3.4 Course content	

3.5 Types of coursework

x	Lectures	x	Exercises	x	Blended e-learning	x	Individual activities	X	Laboratory
	Seminars and workshops	x	Distant learning		Field classes		Multimedia and network		Mentorship
	Other	Self-learning from given materials							

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
2	Midterm exams		Practical task	2	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

Activity specification	Percent %	Points
Evaluation during classes		
Class attendance	4,00%	6
Activity during classes	12,00%	18
Test 1	12,00%	18
Test 2	12,00%	18
Test 3	12,00%	18
Colloquium 1	16,00%	24
Colloquium 2	16,00%	24
Colloquium 3	16,00%	24
Evaluation of exam work for students who did not pass the colloquiums and tests		
Written exam	86,00%	126
Total:	**100,00%**	**150**

3.9 Assessment criteria –analysis per learning outcomes

	Ways of evaluating learning outcomes					
	Continuous knowledge check (tests 1, 2 and 3)	**Seminar**	Colloquium **1**	Colloquium **2**	Colloquium **3**	**Total**
Outcome 1	12		14			26
Outcome 2	6		10			16
Outcome 3	18			24		42
Outcome 4	9				12	21
Outcome 5	9				12	21
Outside the outcome						24
Total	54		20	24	28	150

Grading of outcomes (in order to pass the mid-term exam/final exam the student must achieve at least 50% points for each learning outcome)

Points Grade

	127,50 – 150,00 excellent (5) 112,50 – 127,49 very good (4) 93,75 – 112,49 good (3) 75,00 – 93,74 pass (2) 0,00 – 74,49 fail (1)	
3.10 Specific features related with taking the course	During the course, students will write 3 midterm exams. As a rule, midterms are written after every 4 to 5 weeks of classes and cover the learning outcomes covered during that period. As a rule, separate intermediate exams are written separately from theory (tests) and from practical tasks (colloquium). The type of questions and tasks in the midterm exams is defined by the teacher, but all questions and tasks cover the course material or learning outcomes. Regardless of the number of points achieved in an intermediate exam or according to a learning outcome, the student can access all subsequent intermediate exams and other knowledge tests. Only points that are at least 50% of the maximum amount of points per learning outcome are recognized for the final grade. Once student won points in intermediate exams (colloquiums) for each learning outcome are no longer deleted unless the student decides to improve the result for each learning outcome, whereby the points won until then are deleted and newly earned points for that learning outcome are entered if they are more favorable for the students. Student who have not passed all intermediate exams, have the opportunity to correct the exam deadlines on which, as a rule, they take the material in its entirety. Points earned by assignments, attendance and other activities are retained by the student throughout the academic year and can only be corrected exceptionally, with the express approval of the subject teacher.	
3.11 Students obligations	Students have the obligation to attend classes regularly, be active in class and work on learning, practicing and determining the teaching material at home in the fund of hours provided by the ECTS credit system. Full-time students must attend at least 70% of the total number of lecture hours and at least 70% of the total number of practice hours in order to register for the exam. Part-time students must attend at least 50% of the total number of hours of lectures provided for them and at least 50% of the total number of hours of exercises provided for them in order to be able to register for the exam. Otherwise they cannot take the exams and have to re-enroll the subject. Students who for some reason do not have to attend classes are required to periodically contact teachers during classes, by email or by coming to consultations, related to classes and teaching materials. Students who frequently disrupt classes will be removed from class, and their attendance will not be recorded.	
3.12 Written assignments		
3.13 Required reading	1.	
	2.	
3.14 Additional reading	1.	
	2.	
	3.	

4 ADDITIONAL COURSE INFORMATION		
4.1 Quality control	In accordance with the acts of the Polytechnic of Međimurje in Čakovec.	
4.2 Contact the teacher	Students can contact the teacher during the consultation period (two hours per week) and during classes, while for short questions and explanations they can contact 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 as soon as possible (except during weekends or holidays). It is recommended that students come for consultations as often as possible during the learning period, ie during the teaching period.	
4.3 Information about the course	It is the obligation of each student to be regularly informed about the course. All notifications about the holding 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	Apply the acquired learning skills, basic knowledge of the profession and problem solving necessary for continuing studies at a higher level. Apply relevant mathematical and statistical methods in software engineering.	

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	**Computer architecture**			
1.2 Study program/s	**Undergraduate professional study of Computer Science**			
1.3 Course status (M,E)	**Mandatory**	**1.6 Mode of instruction (number of hours)**	**Lectures**	30
1.4 Course code	5014		**Exercises**	45
1.5 Course abbreviation	AR		**Seminars**	
1.6 Semester	III		**E-learning**	
1.7 ECTS	6	**1.7 Place and time of instruction**	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	MSc. Željko Knok/ senior lecturer	**contact**	zknok@mev.hr
		contact	
2.2 Assistant/s- title		**contact**	
		contact	
2.3 Instruction held by-title	MSc. Željko Knok/ senior lecturer	**contact**	

3. COURSE DESCRIPTION

3.1 Course goals	The student should get acquainted with the components that make up the computer as a whole, different computer architecture, how to execute instructions and programming in machine code.
3.2 Prerequisites	To take the course, it is necessary to pass the courses Digital Electronic Circuits and Computer Applications
3.3 Course outcomes	After successfully completing the course, students will be able to: O1 - Explain the building blocks of the computer and the architecture of the Atmel Atmega328p microcontroller O2 - Draw the connection of digital inputs and outputs with a microcontroller O3 - Create an assembler program that uses input-output circuits and arithmetic logic operations O4 - Create a program in assembler that uses timing and interrupts
3.4 Course content	The course presents contents related to working with the database through objects, stored tasks, permissions and access controls. In the practical part, open source tools are used.

3.5 Types of coursework										
	x	Lectures	x	Exercises		Blended e-learning	x	Individual activities		Laboratory
		Seminars and workshops		Distant learning		Field classes		Multimedia and network		Mentorship
		Other								

3.6 Language of instruction	Croatian /English

3.7 Monitoring students' work (enter the						
	1,00	Class attendance		Seminars		Essay
	1,00	Class activity		Project		Report/paper

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)

2,00	Midterm exams	2,00	Practical task	1,00	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

Activity specification	Percent %	Points
Assessment during instruction		
Attendance	5%	5
Class activity	5%	5
Seminar/ project/ essay	30%	30
Midterm exam 1	30%	30
Midterm exam 2	30%	30
Exam assessment for the students who failed to fullfil all the obligatory requirements during the semester		
Written exam	*60%*	*60*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

	Ways of evaluating learning outcomes					
	Attendance	**Activity**	**Mid-term exam 1**	**Mid-term exam 2**	**Practical work**	**Total**
Outcome 1			15		10	25
Outcome 2			15		5	20
Outcome 3				15	5	20
Outcome 4				15	10	25
Outcome not-related						10
Total	5	5	30	30	30	100

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

3.10 Specific features related with taking the course

If a student collects 50% of the points of each outcome, he / she directly takes the exam, provided that he / she has done practical work (exercises). A student cannot access the exam period if he / she has not achieved min. 60% correct answers. Practical work-exercises are made according to the instructions published on the Merlin system and are submitted by posting on the Merlin. Checking the completed exercises is done in the exercise classes after prior preparation with the teacher. During the semester, the student is required to perform five exercises independently. Practical work (completed exercises) is taught until the last week of lectures. During the exam, it is possible to orally check the knowledge from practical work (exercises).

If a student does not achieve a sufficient number of points on the midterm exam, 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 did not take the colloquium access the written part of the exam where all learning outcomes are checked, and are required to have completed exercises before taking the exam.	
3.11 Students obligations	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. 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.	
3.12 Written assignments		
3.13 Required reading	1.	
	2.	
3.14 Additional reading		
	1.	Atmel Corporation : 8-bit AVR Microcontroller with 32K Bytes In-System Programmable Flash, San Jose , 2016
	2.	Atmel Corporation : AVR Instruction Set Manual, San Jose , 2016
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	Select the appropriate programming language and technology when solving programming tasks. Apply the acquired learning skills, basic knowledge of the profession and problem solving necessary for continuing studies at a higher level.

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	Object Oriented Programming 1			
1.2 Study program/s	Undergraduate professional study of *Computer Science*			
1.3 Course status (O,E)	Mandatory	**1.6 Mode of instruction (number of hours)**	**Lectures**	30
1.4 Course code	5124		**Exercises**	30
1.5 Course abbreviation	OOP1		**Seminars**	
1.6 Semester	III		**E-learning**	
1.7 ECTS	6	**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	PhD. Bruno Trstenjak, senior lecturer Dino Kalamari, lecturer	**contact**	btrstenjak@mev.hr dkalamari@mev.hr
		contact	
2.2 Assistant/s- title		**contact**	
		contact	
2.3 Instruction held by-title	Dino Kalamari, lecturer	**contact**	

3. COURSE DESCRIPTION

3.1 Course goals	Creating the skills and knowledge needed to effectively use modern object-oriented programming languages.
3.2 Prerequisites	Required input competencies are the use of the procedural programming paradigm, knowledge and use of data types and control structures, knowledge and use of one-dimensional and multidimensional data fields as defined by the learning outcomes of the course Programming. The condition for taking the course is the passed subject Programming.
3.3 Course outcomes	After successfully completing the course, students will be able to: I1 - Use simple (primitive, value) and complex (class-based) data types. I2 - Apply control structures of programming language. I3 - Apply classes and their components available in program libraries. I4 - Apply closure, inheritance and multiplicity. I5 - Use data storage structures. I6 - Use exception handling in program code. I7 - Use graphical user interface elements.
3.4 Course content	In the course, students learn the basic concepts of object-oriented programming: classroom closure, outward interface, inheritance, and multifacetedness. The difference between procedural and object-oriented programming paradigms. Development of console and GUI desktop applications. Exception processing, control structures, data storage collections.

3.5 Types of coursework	x	Lectures	x	Exercises		Blended e-learning	x	Individual activities		Laboratory

<table>
<tr><td></td><td></td><td>Seminars and workshops</td><td>x</td><td>Distant learning</td><td></td><td>Field classes</td><td></td><td>Multimedia and network</td><td></td><td>Mentorship</td></tr>
<tr><td></td><td></td><td>Other</td><td colspan="8"></td></tr>
<tr><td>3.6 Language of instruction</td><td colspan="10">Croatian</td></tr>
<tr><td rowspan="6">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)</td><td>2</td><td colspan="2">Class attendance</td><td></td><td colspan="2">Seminars</td><td></td><td colspan="2">Essay</td></tr>
<tr><td></td><td colspan="2">Class activity</td><td></td><td colspan="2">Project</td><td></td><td colspan="2">Report/paper</td></tr>
<tr><td>2</td><td colspan="2">Midterm exams</td><td>2</td><td colspan="2">Practical task</td><td></td><td colspan="2">Continuous knowledge check</td></tr>
<tr><td></td><td colspan="2">Written exam</td><td></td><td colspan="2">Experimental work</td><td></td><td colspan="2"></td></tr>
<tr><td></td><td colspan="2">Oral exam</td><td></td><td colspan="2">Research</td><td></td><td colspan="2"></td></tr>
<tr><td colspan="10"></td></tr>
<tr><td>3.8 Assessment and evaluation of students' work during classes and at the final exam</td><td colspan="10">The course has 7 defined learning outcomes.
A maximum of 200 points can be earned per course.
Learning outcomes are scored and checked through the following methods

First intermediate exam (M1): up to 40 points, of which 20 are achieved by a theoretical test and 20 by practical work.
Second intermediate exam (M2): up to 60 points, of which 30 are achieved by a theoretical test and 30 by practical work.
Third intermediate exam (M3): up to 100 points, of which 50 are achieved by a theoretical test and 50 by practical work.

The initial criterion for calculating the grade is expressed in the following list:
● 100-125 Sufficient (2)
● 126-150 Good (3)
● 151-175 Very good (4)
● 176-200 Excellent (5)

The final criterion for calculating the grade will be created based on the Normal distribution of the total points achieved by all students in the intermediate exams M1, M2 and M3. If the newly created criterion based on the Normal distribution is less favorable for students, they will apply the Initial criterion.</td></tr>
<tr><td>3.9 Assessment criteria – analysis per learning outcomes</td><td colspan="10"><table>
<tr><th></th><th>M1</th><th>M2</th><th>M3</th><th>IN TOTAL</th></tr>
<tr><td>Outcome 1</td><td>10</td><td>10</td><td>10</td><td>30</td></tr>
<tr><td>Outcome 2</td><td>10</td><td>10</td><td>10</td><td>30</td></tr>
<tr><td>Outcome 3</td><td>10</td><td>10</td><td>20</td><td>40</td></tr>
<tr><td>Outcome 4</td><td></td><td>20</td><td>20</td><td>40</td></tr>
<tr><td>Outcome 5</td><td>10</td><td>10</td><td>10</td><td>30</td></tr>
<tr><td>Outcome 6</td><td></td><td></td><td>20</td><td>20</td></tr>
<tr><td>Outcome 7</td><td></td><td></td><td>10</td><td>10</td></tr>
<tr><td>In total</td><td>40</td><td>60</td><td>100</td><td>200</td></tr>
</table></td></tr>
<tr><td>3.10 Specific features related with taking the course</td><td colspan="10">As a rule, the first midterm exam is written after the first 4 weeks of classes and covers the learning outcomes covered in the first 4 weeks. The second midterm exam is written after the other 9 weeks of classes and covers the learning outcomes covered by the ninth week of classes. The third midterm</td></tr>
</table>

	exam is written after the second 14 weeks of teaching and covers the learning outcomes processed up to the 14th week of teaching. The type of questions is defined by the teacher, but all questions and tasks cover the course material or learning outcomes. By additional work and commitment through the preparation of homework, the student can achieve an additional amount of points by which his total amount of points does not exceed 200. Students who do not pass the colloquia are required to take the written and oral part of the exam. The condition for taking the oral part of the exam is passing the written part of the exam.	
3.11 Students obligations	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. 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.	
3.12 Written assignments		
3.13 Required reading	1.	
	2.	
3.14 Additional reading	1.	
	2.	
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	Apply the acquired learning skills, basic knowledge of the profession and problem solving necessary for continuing studies at a higher level. Apply communication and professional ethics. Develop programming code in multiple programming languages using modern methods and tools. Choose ways of structuring data in program code, as well as techniques for writing complex program forms and use standard algorithms. Develop applications using an object-oriented paradigm in solving program tasks.

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	**Databases I**			
1.2 Study program/s	**Undergraduate professional study of Computer Science**			
1.3 Course status (M,E)	**Mandatory**	**1.6 Mode of instruction (number of hours)**	**Lectures**	30
1.4 Course code			**Exercises**	30
1.5 Course abbreviation	PB1		**Seminars**	
1.6 Semester	IV		**E-learning**	
1.7 ECTS	5	**1.7 Place and time of instruction**	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	MSc. Željko Knok/ Senior lecturer	**contact**	zknok@mev.hr
		contact	
2.2 Assistant/s- title		**contact**	
		contact	
2.3 Instruction held by-title	MSc. Željko Knok/ Senior lecturer	**contact**	

3. COURSE DESCRIPTION

3.1 Course goals	The student will be able to manage the database after completing the course. Knowledge is acquired in the field of database, SQL query language and the capabilities and role of information retrieval systems in the information system.
3.2 Prerequisites	To take the course it is necessary to pass the course Algorithms and Data Structures
3.3 Course outcomes	After successfully completing the course, students will be able to: O1 - Create basic queries in SQL language independently O2 - Link multiple data tables using SQL queries O3 - Design and optimize a normalized database using indexes O4 - Create a simple database
3.4 Course content	The course presents contents related to the concept, possibilities and role of the database. Special attention is given to data search using SQL language, modeling and database maintenance. In the practical part, open source tools are used.

3.5 Types of coursework										
	x	Lectures	x	Exercises		Blended e-learning	x	Individual activities		Laboratory
		Seminars and workshops		Distant learning		Field classes	x	Multimedia and network		Mentorship
		Other								

3.6 Language of instruction	Croatian /English

3.7 Monitoring students' work (enter the number of ECTS credits for each						
	1,00	Class attendance		Seminars		Essay
	1,00	Class activity		Project		Report/paper
	1,00	Midterm exams	1,00	Practical task	1,00	Continuous knowledge check

activity so that the total number of ECTS credits is equal to the total ECTS value of the course, 1 ECTS = 30 hours)		Written exam		Experimental work		
		Oral exam		Research		

3.8 Assessment and evaluation of students' work during classes and at the final exam

Activity specification	Percent %	Points
Assessment during instruction		
Attendance	5%	5
Class activity	5%	5
Seminar/ project/ essay	30%	30
Midterm exam 1	30%	30
Midterm exam 2	30%	30
Exam assessment for the students who failed to fullfil all the obligatory requirements during the semester		
Written exam	*60%*	*60*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

Ways of evaluating learning outcomes						
	Attendance	**Activity**	**Mid-term exam 1**	**Mid-term exam 2**	**Practical work**	**Total**
Outcome 1			15		10	25
Outcome 2			15		5	20
Outcome 3				15	5	20
Outcome 4				15	10	25
Outcome not-related						10
Total	5	5	30	30	30	100

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

3.10 Specific features related with taking the course

If a student collects 50% of the points of each outcome, he / she directly takes the exam, provided that he / she has done practical work (exercises). A student cannot access the exam period if he / she has not achieved min. 60% correct answers. Practical work-exercises are made according to the instructions published on the Merlin system and are submitted by posting on the Merlin. Checking the completed exercises is done in the exercise classes after prior preparation with the teacher. During the semester, the student is required to perform five exercises independently. Practical work (completed exercises) is taught until the last week of lectures. During the exam, it is possible to orally check the knowledge from practical work (exercises).

If a student does not achieve a sufficient number of points on the midterm exam, 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 did not take the colloquium access the written part of the exam where all learning outcomes are checked, and are required to have completed exercises before taking the exam.	
3.11 Students obligations	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. 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.	
3.12 Written assignments		
3.13 Required reading	1.	Abraham Silberschatz: DATABASE SYSTEM CONCEPTS SIXTH EDITION, 201
	2.	
3.14 Additional reading	1.	
	2.	
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	Use English in the domain of ICT in communication with experts and lay people. Apply database basics through database creation, modeling and administration. Develop web and mobile projects, applying advanced technologies and connecting to databases using modern methods and tools	

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	Operating systems			
1.2 Study program/s	Undergraduate professional study of *Computer Science*			
1.3 Course status (O,E)	Mandatory	**1.6 Mode of instruction (number of hours)**	**Lectures**	30
1.4 Course code	5015		**Exercises**	30
1.5 Course abbreviation	OS		**Seminars**	
1.6 Semester	IV.		**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	PhD. Bruno Trstenjak, senior lecturer Dino Kalamari, lecturer	**contact**	btrstenjak@mev.hr dkalamari@mev.hr
		contact	
2.2 Assistant/s- title		**contact**	
		contact	
2.3 Instruction held by- title	Dino Kalamari, lecturer	**contact**	

3. COURSE DESCRIPTION

3.1 Course goals	The main thematic units of the course include knowledge in the following areas: (i) definition and role of the operating system, (ii) management of directories and files and reading and writing data, (iii) computer processes and multi-threaded parallel execution of program code, (iv) synchronization mechanisms. The primary goal of the course is to teach students about these four topics and them provide knowledge and skills from the above four thematic groups in order to be able to successfully master the defined learning outcomes
3.2 Prerequisites	To take the course, it is necessary to pass the course Programming and Object Oriented Programming 1.
3.3 Course outcomes	I1. Compare and evaluate the elements of the operating system with regard to their development and application in accordance with modern needs. I2. Generate program code that uses existing system calls. I3. Generate program code for managing files and directories. I4. Generate program code to write and read data to the file system. I5. Compare the computer process and the computer thread and justify the application of one or the other. I6. Generate process management program code. I7. Generate code for managing threads. I8. Compare synchronization mechanisms and justify the use of an individual with regard to the problem.
3.4 Course content	The course teaches knowledge in the field of file management, where students are explained in general the possibilities of system calls on examples of

	retrieving data about various parts of the operating system. The system calls for working with the file system, retrieving data related to the file system and the files themselves are displayed. The options for system calls, file management, and writing and reading data are displayed. The following section introduces the concept of a computer process and a computer thread, and shows the system calls of the operating system for working with processes and threads, the display of the list of processes and process data. Examples of starting a tree are explained and the differences and similarities of a tree and a process are analyzed. The last unit provides knowledge and skills related to synchronization mechanisms necessary in the conditions of parallel execution of program code. System calls by which the Monitor, Mutex and Semaphore synchronization mechanisms are realized are processed. The use of synchronization mechanisms on the problem of hungry philosophers, the problem of producers and consumers, and other examples.

3.5 Types of coursework	x	Lectures	x	Exercises		Blended e-learning	x	Individual activities		Laboratory
		Seminars and workshops	x	Distant learning		Field classes		Multimedia and network		Mentorship
		Other								

3.6 Language of instruction	Croatia

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
	1.5	Midterm exams	1.5	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	**Assessment and evaluation of student work during the semester** The course has 8 defined learning outcomes, a passing grade is awarded if the student has met at least 50% on each of the learning outcomes. A maximum of 200 points can be earned per course. Learning outcomes are scored and checked through the following methods: First intermediate exam (M1): up to 40 points, of which 20 are achieved by a theoretical test and 20 by practical work. Second intermediate exam (M2): up to 60 points, of which 30 are achieved by a theoretical test and 30 by practical work. Third intermediate exam (M3): up to 100 points, of which 50 are achieved by a theoretical test and 50 by practical work. The criterion for calculating the grade is expressed as follows: ● 100-125 Sufficient (2) ● 126-150 Good (3) ● 151-175 Very good (4)

<table>
<tr><td></td><td>
● 176-200 Excellent (5)

Through additional work and commitment through homework and designing and creating their own projects during the semester, the student can earn an additional amount of points. All these activities must be agreed in advance with the lecturers on the course, and all such papers and projects must be designed, developed and submitted for evaluation by the end of the 14th week of classes in the semester.

Assessment and evaluation of student work on the exam

Students who do not achieve 100 or more points during the semester are required to take an exam that evaluates all learning outcomes defined in the course. The student must achieve at least 50% points on each of the learning outcomes.
The exam is conducted in the following ways:
● Solving a test on a computer within the e-learning system (Moodle / Loomen).
● Creating a software solution on a computer based on assigned tasks.
● Talk to the student about the software solution.

Of the exam methods defined in the list above, the exam will contain at least two elements. Each of the elements examines all defined learning outcomes, with some elements paying more attention to theoretical knowledge while others to practical skills and understanding of the subject.
To pass the exam, it is necessary to satisfy all learning outcomes with at least 50% points on each of the elements, and to achieve at least 50% points in total to access the next element of the exam. During the exam, a student can achieve a maximum of 100 points, and is entitled to a grade if he has 50 or more points.

The grade is awarded according to this criterion:
● 50 - 63: Sufficient (2)
● 64 - 75: Good (3)
● 76 - 88: Very good (4)
● 89 - 100: Excellent (5)
</td></tr>
<tr><td>3.9 Assessment criteria – analysis per learning outcomes</td><td>
<table>
<tr><th></th><th>M1</th><th>M2</th><th>M3</th><th>IN TOTAL</th></tr>
<tr><td>Outcome 1</td><td>10</td><td></td><td>10</td><td>20</td></tr>
<tr><td>Outcome 2</td><td>10</td><td></td><td>10</td><td>20</td></tr>
<tr><td>Outcome 3</td><td>10</td><td></td><td>10</td><td>20</td></tr>
<tr><td>Outcome 4</td><td>10</td><td></td><td>10</td><td>20</td></tr>
<tr><td>Outcome 5</td><td></td><td>15</td><td>15</td><td>30</td></tr>
<tr><td>Outcome 6</td><td></td><td>15</td><td>15</td><td>30</td></tr>
<tr><td>Outcome 7</td><td></td><td>15</td><td>15</td><td>30</td></tr>
<tr><td>Outcome 8</td><td></td><td>15</td><td>15</td><td>30</td></tr>
<tr><td>In total</td><td>40</td><td>60</td><td>100</td><td>200</td></tr>
</table>
</td></tr>
<tr><td>3.10 Specific features related with taking the course</td><td>During the semester, students will collect points in 3 midterm exams.

As a rule, the first midterm exam is written after the first 4 weeks of classes and covers the learning outcomes covered in the first 4 weeks.</td></tr>
</table>

	The second midterm exam is written after the other 9 weeks of classes and in principle covers the learning outcomes processed up to the ninth week of classes, with more attention being paid to the outcomes from the previous 4 weeks. The third midterm exam is written after the second 14 weeks of teaching and covers the learning outcomes processed up to the 14th week of teaching, with more attention being paid to the outcomes processed in the 10th to 14th week of teaching. The type of questions is defined by the teacher, but all questions and tasks cover the course material or learning outcomes.	
3.11 Students obligations	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. 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.	
3.12 Written assignments		
3.13 Required reading	1.	Budin, Golub, Jakobović, Jelenković, Operating Systems, Element, Zagreb, 2011
	2.	
3.14 Additional reading	1.	Tanenbaum, Modern operating systems, 3rd ed, Prentice hall, 2007.
	2.	Silberschatz, S. Galvin, Operating System Concepts, Addison Wesley Publishing Company, Reading, Mass., 8th ed, 2008.
	3.	W. Kort: Programming in C #, Exam Ref 70-483, Microsoft Press
	4.	Lecture content for the course (PPT presentations) available on the Loomen system
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	Apply the acquired learning skills, basic knowledge of the profession and problem solving necessary for continuing studies at a higher level. Apply communication and professional ethics. Develop programming code in multiple programming languages using modern methods and tools. Identify the basic specifics of operating systems. Choose ways of structuring data in program code, as well as techniques for writing complex program forms and use standard algorithms. Install, configure, and manage specific operating systems and network services in complex network environments

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	Computer networks			
1.2 Study program/s	Undergraduate professional study of Computer Science			
1.3 Course status (O,E)	O	**1.6 Mode of instruction (number of hours)**	**Lectures**	30
1.4 Course code			**Exercises**	30
1.5 Course abbreviation	RMR		**Seminars**	
1.6 Semester	4		**E-learning**	
1.7 ECTS	6	**1.7 Place and time of instruction**	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**	robert.poljak@mev.hr
		contact	
2.3 Instruction held by- title	Jurica Trstenjak/ Senior lecturer Robert Poljak/ lecturer	**contact**	

3. COURSE DESCRIPTION

3.1 Course goals	Introduction to the basic concepts, structure and principles of operation of computer networks and their components such as network devices, data transmission media and network protocols.
3.2 Prerequisites	No
3.3 Course outcomes	After completing the course assignments, students will be able to: O1. Explain the basic communication protocols and services by layers of the reference OSI model O2. Implement network traffic routing mechanisms in accordance with the requirements of the network topology O3. Apply subnetting techniques to a network topology O4. Implement protection and security in computer networks
3.4 Course content	Local Computer Networks:purpose, types, features, selection, application, configuration, cabling, advantages, disadvantages. Active devices: repeaters, routers. Wireless networks and home Wireless networks. Connecting computer equipment. Modems: types, limits, application, configuration. Data transfer to phone systems. Analog and digital telephony. ISDN. Mobile phones. Connections, applications, restrictions. Global computing networks: PSDN, ISO-OSI. Internet: organization, technology, protocols (TCP / IP, DNS, SMTP, FTP, Telnet, HTTP). Network services: mail, www. Security, risks and protection of computer networks.

3.5 Types of coursework										
	x	Lectures	x	Exercises		Blended e-learning	x	Individual activities	x	Laboratory
		Seminars and workshops		Distant learning		Field classes	x	Multimedia and network		Mentorship
		Other								

3.6 Language of instruction

Croatian/English

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 (L+E)		Seminars		Essay
	Class activity		Project	0,5	Report/paper
3,5	Exams (midterm)		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

Activity specification	Percent %	Points
Assessment during instruction		
Attendance	5%	5
Class activity	5%	5
Oral part of midterm	12%	12
Midterm exam 1	30%	30
Midterm exam 2	30%	30
Practical task	18%	18
Exam assessment for the students who failed to fullfil all the obligatory requirements during the semester		
Written exam	*60%*	*60*
Oral Exam	*12%*	*12*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

Ways of evaluating learning outcomes							
	Attendance	**Activity**	**Oral part of midterm**	**Mid-term exam 1**	**Mid-term exam 2**	**Practical work**	**Total**
Outcome 1			3	15		4	22
Outcome 2			3	15		4	22
Outcome 3			3		15	5	23
Outcome 4			3		15	5	23
Outcome not-related	5	5					10
Total	5	5	12	30	30	18	100

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

3.10 Specific features related with taking the course

In order for a student to pass the course, he / she must earn a minimum of 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 earned in the midterm exams for each learning outcome is no longer deleted unless the student decides to correct the result for each learning outcome, whereby the points earned so far are deleted and newly earned 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 did not take the midterm exam take the written and oral part of the exam, where all learning outcomes are checked, and they are required to submit all homework before taking the exam. In order to start writing the midterm exam, the student must complete all previous homework assignments.	
3.11 Students obligations	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. 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.	
3.12 Written assignments		
3.13 Required reading	1.	Tanenbaum, A.S.: Computer Networks, 5th Edition, Prentice Hall 2011.
	2.	
3.14 Additional reading	1.	
	2.	
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	Apply the acquired learning skills, basic knowledge of the profession and problem solving necessary for continuing studies at a higher level. Use English in the domain of ICT in communication with experts and lay people. Distinguish types and communication protocols of computer networks. Use tools and methods to plan, build and maintain computer networks based on wired or wireless communication media. Analyze user needs (research and detect data sources, currently present business systems, technological limitations, specifics of the business environment)	

	Apply standards, methods and techniques to analyze security threats and combat threats

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	**Programming tools in programming**			
1.2 Study program/s	Undergraduate professional study in Computer Science			
1.3 Course status (O,E)	Obligatory	**1.6 Mode of instruction (number of hours)**	**Lectures**	30
1.4 Course code			**Exercises**	30
1.5 Course abbreviation	PAUP		**Seminars**	
1.6 Semester	4		**E-learning**	
1.7 ECTS	6	**1.7 Place and time of instruction**	The premises of Polytechnic of Medjimurje in Cakovec, according to schedule published on web pages	

2. TEACHING STAFF

2.1 Course leader/s-title	PhD. Bruno Trstenjak senior lecturer Miran Kovačić, lecturer	**contact**	btrstenjak@mev.hr mkovacic@mev.hr
		contact	
2.2 Assistant/s- title		**contact**	
		contact	
2.3 Instruction held by-title	Miran Kovačić, lecturer	**contact**	

3. COURSE DESCRIPTION

3.1 Course goals	After completing the course, the student will gain an overview of modern software tools for the development of complex programs. Knowledge is acquired in the field of web application development and the student is trained to independently perform problem tasks in the application of software tools.
3.2 Prerequisites	Passed course: Programming
3.3 Course outcomes	After successfully completing the course, students will be able to: O1 – Explain the properties and how to use the various software tools O2 – Design web applications using basic elements O3 – Properly use tools in the process of validation, responsive design, generating different file types O4 – Independently create a web application according to a given problem task with the use of various software tools
3.4 Course content	The course will contain contents that will give students knowledge about modern software tools and how to use them in order to develop modern applications. Content is processed from the aspect of programming and use of C # programming language.

3.5 Types of coursework										
	X	Lectures	X	Exercises		Blended e-learning	X	Individual activities		Laboratory
		Seminars and workshops	X	Distant learning		Field classes		Multimedia and network		Mentorship
		Other								

3.6 Language of instruction	Croatian/English					
	2,0	Class attendance		Seminars		Essay

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)

	Class activity		Project		Report/paper
	Midterm exams	3,0	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

Activity specification	Percent %	Points
Assessment during instruction		
Attendance	5%	5
Project	75%	75
Continuous assessment	20%	20
Exam assessment for the students who failed to fullfil all the obligatory requirements during the semester		
Project	*75%*	*75*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

Ways of evaluating learning outcomes				
	Attendance	**Continuous assessment**	**Project**	**Total**
Outcome 1		5	10	15
Outcome 2		5	10	15
Outcome 3		5	10	15
Outcome 4		5	45	50
Outcome not-related	5			5
Total	**5**	**20**	**75**	**100**

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

3.10 Specific features related with taking the course

If a student collects 50% of the points of each outcome, he / she directly takes the exam, if he / she has submitted a seminar paper. A student cannot access the exam if he / she has not submitted a seminar paper. Seminar papers are prepared according to the instructions published on the Merlin system and are submitted by posting on the Merlin. The seminar paper should be submitted at least 3 days before the exam deadline.

3.11 Students obligations

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.
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.	
3.12 Written assignments		
3.13 Required reading	1.	Dino Esposito: Programming Microsoft ASP.NET MVC 2014
	2.	
3.14 Additional reading	1.	Jon Galloway: Professional ASP.NET MVC 5, Wrox, 2014
	2.	Joel Murach and Mary Delamater : Murach's ASP.NET Core MVC, Mike Murach & Associates,2020
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	- Work in a team, manage professional projects and cooperate with experts from the real sector - Develop programming code in multiple programming languages using modern methods and tools - Choose ways of structuring data in program code, as well as techniques for writing complex program forms and use standard algorithms - Apply database basics through database creation, modelling and administration - Use Cloud computing as a concept to access data and applications	

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	**Web content creation**			
1.2 Study program/s	Undergraduate professional study programme in Computer Science			
1.3 Course status (O,E)	elective	**1.6 Mode of instruction (number of hours)**	**Lectures**	15
1.4 Course code			**Exercises**	45
1.5 Course abbreviation	IWS		**Seminars**	
1.6 Semester	IV		**E-learning**	
1.7 ECTS	4	**1.7 Place and time of instruction**	Premises of the Polytechnic of Međimurje in Čakovec, according to the schedule published on the website of the Polytechnic	

2. TEACHING STAFF

2.1 Course leader/s-title	PhD, Sanja Brekalo, High School Professor	**contact**	sbrekalo@mev.hr
		contact	
2.2 Assistant/s- title		**contact**	
		contact	
2.3 Instruction held by-title	PhD, Sanja Brekalo, High School Professor	**contact**	

3. COURSE DESCRIPTION

3.1 Course goals	After completing the course, the student will be able to apply client web technologies and create a simple website. Knowledge in the field of web technologies is acquired and the student is trained to perform a web creation tasks independently.
3.2 Prerequisites	
3.3 Course outcomes	After successfully completing the course, students will be able to: I1 - Create semantic web pages using different HTML tags and HTML5 design guidelines I2 - Design a web page using CSS selectors, properties and values, positioning techniques and editing HTML elements I3 - Apply responsive design to the website I4 - Create interactive tasks and web pages using JavaScript I5 - Create web pages independently using client web technologies
3.4 Course content	The course presents content related to the creation of web pages using client web technologies. The contents are processed from the aspect of programming and application of scripting and programming technologies. The teaching units present content related to HTML, CSS and JavaScript. Special emphasis is placed on HTML5 elements, CSS3 and ES6 JavaScript.

3.5 Types of coursework										
	x	Lectures	x	Exercises		Blended e-learning	x	Individual activities		Laboratory
		Seminars and workshops	x	Distant learning		Field classes	x	Multimedia and network		Mentorship
		Other								

3.6 Language of	Croatian/English

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
1	Midterm exams	1	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

Activity specification	Percent %	Points
Assessment during instruction		
Attendance	5%	5
Class activity	5%	5
Seminar/ project/ essay	30%	30
Midterm exam 1	30%	30
Midterm exam 2	30%	30
Exam assessment for the students who failed to fulfil all the obligatory requirements during the semester		
Written exam	*60%*	*60*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

	Ways of evaluating learning outcomes					
	Attendance	**Activity**	**Mid-term exam 1**	**Mid-term exam 2**	**Practical work**	**Total**
Outcome 1			10			10
Outcome 2			10		5	15
Outcome 3			10		5	15
Outcome 4				20	10	30
Outcome 5				10	10	20
Outcome not-related						10
Total						

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

3.10 Specific features related with taking the course

If a student collects 50% of the points of each outcome, he / she directly take the exam, provided that he / she have submitted a practical task. A student cannot take the exam if he / she have not submitted a practical task. The practical task is made according to the instructions published on the Merlin system and is submitted by placing it on the Merlin. The practical task is submitted at least 3 days before the exam. During the exam, it is possible to verbally check the knowledge in the preparation of practical task.

If a student does not achieve a sufficient number of points on the midterm exam, 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.	
3.11 Students obligations	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. 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.	
3.12 Written assignments		
3.13 Required reading	1.	Jennifer Robbins, Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics 5th Edition, O'Reilly, 2018.
	2.	
3.14 Additional reading	1.	
	2.	
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	IS7 Develop programming code in several programming languages using modern methods and tools IS13 Develop applications using an object-oriented paradigm in solving programming tasks IS17 Select the appropriate programming language and technology when solving programming tasks IS16 Develop web and mobile projects, applying advanced technologies and connecting to databases using modern methods and tools	

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	**Multimedia**			
1.2 Study program/s	Undergraduate professional study programme in Computer Science			
1.3 Course status (O,E)	elective	**1.6 Mode of instruction (number of hours)**	**Lectures**	15
1.4 Course code			**Exercises**	45
1.5 Course abbreviation	MM		**Seminars**	
1.6 Semester	IV		**E-learning**	
1.7 ECTS	4	**1.7 Place and time of instruction**	Premises of the Polytechnic of Međimurje in Čakovec, according to the schedule published on the website of the Polytechnic	

2. TEACHING STAFF

2.1 Course leader/s-title	PhD, Sanja Brekalo, High School Professor	**contact**	sbrekalo@mev.hr
		contact	
2.2 Assistant/s- title		**contact**	
		contact	
2.3 Instruction held by-title	PhD, Sanja Brekalo, High School Professor	**contact**	

3. COURSE DESCRIPTION

3.1 Course goals	After completing the course, the student will be able to recognize various aspects of multimedia in computer systems. Knowledge in the field of multimedia is acquired and the student is trained to perform multimedia tasks independently.
3.2 Prerequisites	
3.3 Course outcomes	After successfully completing the course, students will be able to: I1 - Judge the digitization and compression of multimedia data in different media, depending on the file size and end use of each media I2 - Select the optimal colour system for each medium given the differences between individual systems I3 - Choose between vector, raster and 3D graphics depending on the medium in which they are used I4 - Create a 3D model by selecting 3D modelling techniques I5 - Create a multimedia presentation, 3D model and its animation
3.4 Course content	The course presents contents related to multimedia and various media and their specifics from the aspect of digital multimedia. The contents are processed by comparing different types of digital media, their digitization and compression, and the advantages and disadvantages of individual media and multimedia architectures are stated. The teaching units present contents related to digitalization, compression, vector, raster and 3D graphics, video and sound. 3D models are practically created and animated with the addition of other media.

3.5 Types of coursework	x	Lectures	x	Exercises		Blended e-learning	x	Individual activities		Laboratory
		Seminars	x	Distant		Field	x	Multimedia		Mentorship

		and workshops		learning		classes		and network		
		Other								

3.6 Language of instruction	Croatian/English

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
	1	Midterm exams	1	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

Activity specification	Percent %	Points
Assessment during instruction		
Attendance	5%	5
Class activity	5%	5
Seminar/ project/ essay	30%	30
Midterm exam 1	30%	30
Midterm exam 2	30%	30
Exam assessment for the students who failed to fulfil all the obligatory requirements during the semester		
Written exam	*60%*	*60*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

Ways of evaluating learning outcomes						
	Attendance	**Activity**	**Mid-term exam 1**	**Mid-term exam 2**	**Practical work**	**Total**
Outcome 1			5	5		10
Outcome 2			5			5
Outcome 3				5		5
Outcome 4			20	20		40
Outcome 5					30	30
Outcome not-related	5	5				10
Total	5	5	30	30	30	

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

3.10 Specific features related with taking the course

If a student collects 50% of the points of each outcome, he / she directly take the exam, provided that he / she have submitted a practical task. A student cannot take the exam if he / she have not submitted a practical task. The practical task is made according to the instructions published on the Merlin system and is submitted by placing it on the Merlin. The practical task is submitted at least 3 days before the exam. During the exam, it is possible to verbally check the knowledge in the preparation of practical task.

If a student does not achieve a sufficient number of points on the midterm exam, 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.	
3.11 Students obligations	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. 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.	
3.12 Written assignments		
3.13 Required reading	1.	Tay Vaughan, Multimedia: Making It Work, Ninth Edition 9th Edition, Mc Graw Hill Education, 2014
	2.	
3.14 Additional reading	1.	Nigel Chapman, Jenny Chapman, Digital Multimedia, Wiley, 2009.
	2.	
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	IS4 Apply communication and professional ethics IS5 Identify trends in ICT technologies in the domestic and international market IS6 Analyse user needs (investigate and detect data sources, currently present business systems, technological constraints, specifics of the business environment) IS16 Develop web and mobile projects, applying advanced technologies and connecting to databases using modern methods and tools

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	**Digital signal processing**			
1.2 Study program/s	**Undergraduate professional study of Computer Science**			
1.3 Course status (M,E)	Electoral	**1.6 Mode of instruction (number of hours)**	**Lectures**	30
1.4 Course code			**Exercises**	30
1.5 Course abbreviation	DOS		**Seminars**	
1.6 Semester	IV		**E-learning**	
1.7 ECTS	4	**1.7 Place and time of instruction**	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	MSc. Željko Knok/ Senior lecturer	**contact**	zknok@mev.hr
		contact	
2.2 Assistant/s- title		**contact**	
		contact	
2.3 Instruction held by-title	MSc. Željko Knok/ Senior lecturer	**contact**	

3. COURSE DESCRIPTION

3.1 Course goals	After completing the course, the student will master the basic theoretical settings and characteristic examples of signal application, and the most common procedures for their processing in computer-communication systems.
3.2 Prerequisites	The student does not need entry competencies to enroll and take the course
3.3 Course outcomes	After successfully completing the course, students will be able to: O1 - Evaluate the role of signals in computer-communication systems O2 - Use computer signal generation and display O3 - Use algorithms for signal processing and analysis O4 - Use nonlinear signal processing
3.4 Course content	The course presents contents related to working with the database through objects, stored tasks, permissions and access controls. In the practical part, open source tools are used.

3.5 Types of coursework

x	Lectures	x	Exercises		Blended e-learning	x	Individual activities		Laboratory
	Seminars and workshops		Distant learning		Field classes	x	Multimedia and network		Mentorship
	Other								

3.6 Language of instruction	Croatian /English

3.7 Monitoring students' work (enter the number of ECTS credits for each activity so that the

1,00	Class attendance		Seminars		Essay
1,00	Class activity		Project		Report/paper
1,00	Midterm exams	1,00	Practical task		Continuous knowledge check
	Written exam		Experimental work		

total number of ECTS credits is equal to the total ECTS value of the course, 1 ECTS = 30 hours)		Oral exam		Research		

3.8 Assessment and evaluation of students' work during classes and at the final exam

Activity specification	Percent %	Points
Assessment during instruction		
Attendance	5%	5
Class activity	5%	5
Seminar/ project/ essay	30%	30
Midterm exam 1	30%	30
Midterm exam 2	30%	30
Exam assessment for the students who failed to fullfil all the obligatory requirements during the semester		
Written exam	*60%*	*60*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

	Ways of evaluating learning outcomes					
	Attendance	**Activity**	**Mid-term exam 1**	**Mid-term exam 2**	**Practical work**	**Total**
Outcome 1			15		10	25
Outcome 2			15		5	20
Outcome 3				15	5	20
Outcome 4				15	10	25
Outcome not-related						10
Total	5	5	30	30	30	100

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

3.10 Specific features related with taking the course

If a student collects 50% of the points of each outcome, he / she directly takes the exam, provided that he / she has done practical work (exercises). A student cannot access the exam period if he / she has not achieved min. 60% correct answers. Practical work-exercises are made according to the instructions published on the Merlin system and are submitted by posting on the Merlin. Checking the completed exercises is done in the exercise classes after prior preparation with the teacher. During the semester, the student is required to perform five exercises independently. Practical work (completed exercises) is taught until the last week of lectures. During the exam, it is possible to orally check the knowledge from practical work (exercises).

If a student does not achieve a sufficient number of points on the midterm exam, 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 did not take the colloquium access the written part of the exam where all learning outcomes are checked, and are required to have completed exercises before taking the exam.	
3.11 Students obligations	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. 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.	
3.12 Written assignments		
3.13 Required reading	1.	Digital Signal Processing, 4rd Edition, Dimitris K Manolakis, John G. Proakis, (April 7, 2006)
	2.	
3.14 Additional reading	1.	Fluent Python. CLEAR, CONCISE, AND EFFECTIVE PROGRAMMING, Luciano Ramalho, Published August 20th 2015 by O'Reilly Media
	2.	THINK DSP. DIGITAL SIGNAL PROCESSING IN PYTHON. Allen B. Downey, O'Reilly Media
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	Apply the acquired learning skills, basic knowledge of the profession and problem solving necessary for continuing studies at a higher level. Analyze the basic elements of electrical engineering and digital circuits and identify the structure of the computer.

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	**Software Engineering and Information Systems**			
1.2 Study program/s	Computing			
1.3 Course status (O,E)	O	**1.6 Mode of instruction (number of hours)**	**Lectures**	30
1.4 Course code	5140		**Exercises**	30
1.5 Course abbreviation	PIIS		**Seminars**	
1.6 Semester	5.		**E-learning**	
1.7 ECTS	5	**1.7 Place and time of instruction**	Polytechnic of Međimurje	

2. TEACHING STAFF

2.1 Course leader/s-title	PhD. Josip Nađ, lecturer	kontakt	josip.nad@mev.hr
		contact	
2.2 Assistant/s- title		**contact**	
		contact	
2.3 Instruction held by-title	PhD. Josip Nađ, lecturer	**contact**	

3. COURSE DESCRIPTION

3.1 Course goals	Acquiring basic knowledge of software engineering. Introduction to the role and importance of information systems in business. Getting to know the software development life cycle. Introduction to the main functionalities of business information systems. An overview of trends in software engineering and information systems.
3.2 Prerequisites	
3.3 Course outcomes	After successfully completing the course, students will be able to: O1 - Present methods of user requests collecting and processing O2 - Justify the need for systematic software testing O3 - Analyze the role of information systems in business management O4 - Present the project of information system preparation and implementation
3.4 Course content	The course presents contents related to the basic aspects of software engineering and information systems. Through the project task, students actively go through the life cycle of software, in parallel learning about the problems of industrial information systems.

3.5 Types of coursework

X	Lectures	X	Exercises		Blended e-learning	X	Individual activities		Laboratory
	Seminars and workshops	X	Distant learning	X	Field classes		Multimedia and network		Mentorship
	Other								

3.6 Language of instruction	Croatian

3.7 Monitoring students' work (enter the

1	Class attendance		Seminars		Essay
1,0	Class activity	1,5	Project		Report/paper

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)

1,5	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

Activity specification	Percent %	Points
Assessment during instruction		
Attendance	5%	5
Class activity	5%	5
Seminar/ project/ essay	40%	40
Midterm exam 1	25%	25
Midterm exam 2	25%	25
Exam assessment for the students who failed to fullfil all the obligatory requirements during the semester		
Written exam	*50%*	*50*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

Ways of evaluating learning outcomes						
	Attendance	**Activity**	**Mid-term exam 1**	**Mid-term exam 2**	**Practical work**	**Total**
Outcome 1			15		20	35
Outcome 2			10		20	30
Outcome 3				10		10
Outcome 4				15		15
Outcome not-related	5	5				10
Total	5	5	25	25	40	100

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

3.10 Specific features related with taking the course

A student cannot take the exam if he / she has not submitted the Project Readiness Report (submitted at least 5 days before the exam deadline).
The final grade is obtained on the exam period and is the sum of points earned during classes.
Students who did not take the midterm exams, access the written part of the exam where all learning outcomes are checked.

3.11 Students obligations

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.
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.	
3.12 Written assignments	The project readiness report must be written by computer (Times New Roman, font 12). It is delivered electronically. It must contain project requirements and all supporting documentation that will be defined during the course.	
	1.	Gabriele Piccoli, Federico Pigni: Information Systems for Managers 4.0; Prospect Press, 2019.
3.14 Additional reading	1.	Rod Stephens: Beginning Software Engineering; Wrox, 2015.
	2.	Amiya Kumarrath, Hitesh Mohapatra: Fundamentals of Software Engineering, BPB Publications, 2020.
	3.	American Journal of Software Engineering and Applications
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	OS6 - Analyze user needs (explore and detect data sources, currently present business systems, technological constraints, specifics of the business environment) OS13 - Develop applications using an object-oriented paradigm in solving program tasks OS17 - Select the appropriate programming language and technology when solving programming tasks	

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	**Object oriented programming II**			
1.2 Study program/s	Undergraduate professional study in Computer Science			
1.3 Course status (O,E)	Obligatory	**1.6 Mode of instruction (number of hours)**	**Lectures**	30
1.4 Course code			**Exercises**	30
1.5 Course abbreviation	OOP2		**Seminars**	
1.6 Semester	5		**E-learning**	
1.7 ECTS	5	**1.7 Place and time of instruction**	The premises of Polytechnic of Medjimurje in Cakovec, according to schedule published on web pages	

2. TEACHING STAFF

2.1 Course leader/s-title	PhD. Bruno Trstenjak, senior lecturer	**contact**	btrstenjak@mev.hr
		contact	
2.2 Assistant/s- title		**contact**	
		contact	
2.3 Instruction held by- title	PhD. Bruno Trstenjak, senior lecturer	**contact**	

3. COURSE DESCRIPTION

3.1 Course goals	After completing the course, the student will be able to apply the knowledge to create a simple Java application (desktop and web). Knowledge is acquired in the field of application of the object paradigm and the student is trained to independently perform problem tasks in the field of application of object-oriented programming languages.
3.2 Prerequisites	Passed courses: Object oriented programming 1, Programming tools in programming
3.3 Course outcomes	After successfully completing the course, students will be able to: O1 - Explain the basic methods of creating data structures O2 - Design desktop applications using basic UI elements O3 - Explain the class to work with 2D graphics O4 - Design web services and CRUD methods O5 - Design a REST service in a Cloud environment O6 - Independently create a web application according to the given problem task
3.4 Course content	The course will contain content related to the creation of desktop and web applications based on the Java programming language. The contents are processed from the aspect of programming and application of the Java programming language. The teaching units present contents related to project creation, defining classes, creating UI interfaces, creating services and repositories for database access, development of CRUD methods and REST services in the Cloud environment.

3.5 Types of coursework

X	Lectures	X	Exercises		Blended e-learning	X	Individual activities		Laboratory
	Seminars and workshops	X	Distant learning		Field classes		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)	2,0	Class attendance		Seminars		Essay
		Class activity	1,0	Project		Report/paper
	1,0	Midterm exams		Practical task		Continuous knowledge check
		Written exam		Experimental work		
	1,0	Oral exam		Research		

3.8 Assessment and evaluation of students' work during classes and at the final exam

Activity specification	Percent %	Points
Assessment during instruction		
Attendance	5%	5
Project	40%	40
Midterm exam 1	15%	15
Midterm exam 2	15%	15
Oral exam	25%	25
Exam assessment for the students who failed to fullfil all the obligatory requirements during the semester		
Written exam	*30%*	*30*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

Ways of evaluating learning outcomes						
	Attendance	**Mid-term exam 1**	**Mid-term exam 2**	**Practical work**	**Oral exam**	**Total**
Outcome 1		5		5	5	15
Outcome 2		5		5	5	15
Outcome 3		5		5	5	15
Outcome 4			5	5	5	15
Outcome 5			5	10	5	20
Outcome 6			5	10		15
Outcome not-related	5					5
Total	**5**	**15**	**15**	**40**	**25**	**100**

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

3.10 Specific features related with taking the course

If a student collects 50% of the points of each outcome, he / she directly takes the exam, if he / she has submitted a seminar paper. A student cannot access the exam if he / she has not submitted a seminar paper. Seminar papers are prepared according to the instructions published on the Merlin system and are submitted by posting on the Merlin. The seminar paper should be submitted at least 3 days before the exam deadline.

3.11 Students obligations

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. 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.	
3.12 Written assignments		
3.13 Required reading	1.	Marc Loy: Learning Java: An Introduction to Real-World Programming with Java, Oreilly 2020.
	2.	
3.14 Additional reading	1.	Nick Samoylov: Learn Java 12 Programming: A step-by-step guide to learning essential concepts in Java SE 10, 11, and 12 ,Packt Publishing, 2019.
	2.	Craig Walls: Spring in Action, Manning Publications, 2018.
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	- Work in a team, manage professional projects and cooperate with experts from the real sector - Develop programming code in multiple programming languages using modern methods and tools - Choose ways of structuring data in program code, as well as techniques for writing complex program forms and use standard algorithms - Apply database basics through database creation, modelling and administration Use Cloud computing as a concept to access data and applications	

MEĐIMURSKO VELEUČILIŠTE U ČAKOVCU
POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	Computer networks administration			
1.2 Study program/s	Undergraduate professional study of computer engineering			
1.3 Course status (O, E)	Elective course	**1.6 Mode of instruction (number of hours)**	**Lectures**	15
1.4 Course code			**Exercises**	45
1.5 Course abbreviation	ARM		**Seminars**	
1.6 Semester	5th		**E-learning**	
1.7 ECTS	5	**1.7 Place and time of instruction**	Premises of the Polytechnic of Međimurje in Čakovec, according to the schedule published on the website of the Polytechnic	

2. TEACHING STAFF

2.1 Course leader/s-title	Robert Poljak, lecturer	**contact**	robert.poljak@mev.hr
2.2 Assistant/s- title	-	**contact**	-
2.3 Instruction held by-title	Robert Poljak, lecturer	**contact**	robert.poljak@mev.hr

3. COURSE DESCRIPTION

3.1 Course goals	The goal of the course is to master the concepts of administration and management of moderately complex computer networks.
3.2 Prerequisites	There are no prerequisites for enrolling or finishing the course.
3.3 Course outcomes	After successfully completing the course, students will be able to: I1 - Apply the use of CLI to configure the router I2 - Apply the use of CLI to configure the switch I3 - Compare the advantages and disadvantages of using VLANs I4 - Explain how are DHCP and DNS protocols used I5 - List the advantages and disadvantages of static and dynamic routing
3.4 Course content	The course prepares students to work on moderately complex computer networks using advanced device administration methods and moderately complex network topologies.

3.5 Types of coursework

X	Lectures	X	Exercises		Blended e-learning	X	Individual activities		Laboratory
	Seminars and workshops	X	Distant learning		Field classes		Multimedia and network		Mentorship
	Other								

3.6 Language of instruction	Croatian/English

3.7 Monitoring students' work (1 ECTS = 30 hours)

2	Class attendance		Seminars		Essay
	Class activity		Project		Report/paper
1	Midterm exams	2	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

Activity specification	Percent %	Points
Assessment during instruction		
Midterm for the practical part	70%	70
Midterm for the theoretical part	30%	30
Exam assessment for the students who failed to fulfil all the obligatory requirements during the semester		
Oral exam	*100%*	*100*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

	Practical part	Theoretical part	Total
Outcome 1 (I1)	35		35
Outcome 2 (I2)	35		35
Outcome 3 (I3)		10	10
Outcome 4 (I4)		10	10
Outcome 5 (I5)		10	10
Total	70	30	100

To condition for successfully passing the course is having achieved at least 50% of the points in each learning outcome.

Criteria for achieving the grade	
Points	**Grade**
89 - 100	Excellent (5)
76 - 88	Very good (4)
63 - 75	Good (3)
50 - 62	Pass (2)
0 - 49	Fail (1)

3.10 Specific features related with taking the course

For a student to pass the course, he/she must earn a minimum of 50% of the points available for that learning outcome for EACH learning outcome.
The final grade is obtained on the exam period and is the sum of points earned during classes. Students who did not complete the midterm exam must attend the oral exam where all learning outcomes are checked.

3.11 Students obligations

Full-time students are required to attend at least 70% of the total number of hours of lectures and exercises 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 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.
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.

3.12 Written assignments

Seminar papers must be computer written and must have between 8 and 12 text cards (font Calibri, size 12) from introduction to conclusion, together with pictures, tables, etc. Seminar papers must have an adequate title page, table of content, numbered pages and list of literature used. The seminar paper

	should be divided into chapters and contain a list of references, a list of figures, tables, and graphs and a summary / conclusion containing 250 words. The student guarantees the authenticity of the work with his signature.	
3.13 Required reading	1.	T. McMillan: Cisco Networking Essentials 2nd Edition, Sybex (2015.)
3.14 Additional reading	1.	Wendell Odom: CCNA 200-301 Official Cert Guide, Volume 1 (2019.)
	2.	Web site https://www.netacad.com/
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	**IS10** Distinguish types and communication protocols of computer networks **IS18** Apply standards, methods, and techniques to analyse security threats and defend against them **IS19** Use tools and methods for planning, building, and maintaining computer networks based on wired or wireless communication media **IS20** Install, configure, and manage specific operating systems and network services in complex network environments	

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

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, Sucess / 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

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
Exam assessment for the students who failed to fullfil all the obligatory requirements during the semester		
Written exam	*60%*	*60*
Oral exam	*10%*	*10*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

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

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

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	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. 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.	
3.12 Written assignments		
3.13 Required reading	1.	*Kaufman C., R. Perlman, M. Speciner: Network Security: Private Communication in a Public World, 2nd edition, Pearson Education, 2002*
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	Use English in the domain of ICT in communication with experts and lay people. Analyze user needs (research and detect data sources, currently present business systems, technological limitations, specifics of the business environment). Apply standards, methods and techniques to analyze security threats and combat threats.	

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	**XML programming**			
1.2 Study program/s	Undergraduate professional study programme in Computer Science			
1.3 Course status (O,E)	elective	**1.6 Mode of instruction (number of hours)**	**Lectures**	30
1.4 Course code			**Exercises**	30
1.5 Course abbreviation	XML		**Seminars**	
1.6 Semester	V		**E-learning**	
1.7 ECTS	5	**1.7 Place and time of instruction**	Premises of the Polytechnic of Međimurje in Čakovec, according to the schedule published on the website of the Polytechnic	

2. TEACHING STAFF

2.1 Course leader/s-title	PhD, Sanja Brekalo, High School Professor	**contact**	sbrekalo@mev.hr
		contact	
2.2 Assistant/s- title		**contact**	
		contact	
2.3 Instruction held by-title	PhD, Sanja Brekalo, High School Professor	**contact**	

3. COURSE DESCRIPTION

3.1 Course goals	After completing the course, the student will be able to apply various aspects of using XML files with client, web and XML technologies. The student should get acquainted with the tools for creating XML documents and create programs for managing XML documents.
3.2 Prerequisites	
3.3 Course outcomes	After successfully completing the course, students will be able to: I1 - Create XML and DTD files according to the rules of creation I2 - Connect XML, CSS and XSLT when formatting XML document display in web browsers I3 - Manage the display of XML documents using DOM and JavaScript in web browsers I4 - Develop an application that uses XML to exchange, extract and save data using different programming languages
3.4 Course content	The course presents content related to the development of applications that use XML technologies. The contents of the course are lectured from the aspect of programming and application of scripting and programming technologies. The teaching units present content related to XML, DTD, Schema, XSLT, CSS and JavaScript. Additionally, other programming languages are connected with XML technologies.

3.5 Types of coursework										
	x	Lectures	x	Exercises		Blended e-learning	x	Individual activities		Laboratory
		Seminars and workshops	x	Distant learning		Field classes	x	Multimedia and network		Mentorship
		Other								

3.6 Language of	Croatian/English

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
1	Midterm exams	2	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

Activity specification	Percent %	Points
Assessment during instruction		
Attendance	5%	5
Class activity	15%	15
Seminar/ project/ essay	20%	20
Midterm exam 1	30%	30
Midterm exam 2	30%	30
Exam assessment for the students who failed to fulfil all the obligatory requirements during the semester		
Written exam	*60%*	*60*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

Ways of evaluating learning outcomes						
	Attendance	**Activity**	**Mid-term exam 1**	**Mid-term exam 2**	**Practical work**	**Total**
Outcome 1		5				5
Outcome 2			30			30
Outcome 3				30		30
Outcome 4		10			20	30
Outcome not-related	5					5
Total	5	15	30	30	20	100

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

3.10 Specific features related with taking the course

If a student collects 50% of the points of each outcome, he / she directly take the exam, provided that he / she have submitted a practical task. A student cannot take the exam if he / she have not submitted a practical task. The practical task is made according to the instructions published on the Merlin system and is submitted by placing it on the Merlin. The practical task is submitted at least 3 days before the exam. During the exam, it is possible to verbally check the knowledge in the preparation of practical task.

If a student does not achieve a sufficient number of points on the midterm exam, 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.

3.11 Students obligations

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. 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.	
3.12 Written assignments		
3.13 Required reading	1.	Joe Fawcett , Danny Ayers, Liam R. E. Quin, Beginning XML 5th Edition, Wrox, 2012
	2.	
3.14 Additional reading	1.	Erik T. Ray, Learning XML: Creating Self-Describing Data 2nd Edition, O'Reilly Media, Inc., 2003.
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	IS7 Develop programming code in several programming languages using modern methods and tools IS13 Develop applications using an object-oriented paradigm in solving program tasks IS17 Select the appropriate programming language and technology when solving programming tasks IS16 Develop web and mobile projects, applying advanced technologies and connecting to databases using modern methods and tools	

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	**PHP programming**			
1.2 Study program/s	Undergraduate professional study programme in Computer Science			
1.3 Course status (O,E)	elective	**1.6 Mode of instruction (number of hours)**	**Lectures**	30
1.4 Course code			**Exercises**	30
1.5 Course abbreviation	PHP		**Seminars**	
1.6 Semester	V		**E-learning**	
1.7 ECTS	5	**1.7 Place and time of instruction**	Premises of the Polytechnic of Međimurje in Čakovec, according to the schedule published on the website of the Polytechnic	

2. TEACHING STAFF

2.1 Course leader/s-title	PhD, Sanja Brekalo, High School Professor	**contact**	sbrekalo@mev.hr
		contact	
2.2 Assistant/s- title		**contact**	
		contact	
2.3 Instruction held by-title	PhD, Sanja Brekalo, High School Professor	**contact**	

3. COURSE DESCRIPTION

3.1 Course goals	After completing the course, the student will be able to apply server web technologies and create a simple content management system (CMS). Knowledge in the field of web technologies is acquired and students are trained to perform a web tasks independently.
3.2 Prerequisites	
3.3 Course outcomes	After successfully completing the course, students will be able to: I1 - Use basic PHP functions and syntax to build dynamic web content I2 - Use HTML forms with PHP when adding interactivity I3 - Apply user authentication to a minimum of 2 levels of application management I4 - Develop and implement a database according to the needs of the project I5 - Create a dynamic web application for content management by connecting components and databases
3.4 Course content	The course presents content related to the creation of web pages using client and server web technologies. The contents are lectured from the aspect of programming and application of scripting and programming technologies. The teaching units present contents related to PHP, server and databases. Ultimately, the student creates their own CMS system.

3.5 Types of coursework

x	Lectures	x	Exercises		Blended e-learning	x	Individual activities		Laboratory
	Seminars and workshops	x	Distant learning		Field classes	x	Multimedia and network		Mentorship
	Other								

3.6 Language of	Croatian/English

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
	Midterm exams	3	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

Activity specification	Percent %	Points
Assessment during instruction		
Attendance	5%	5
Class activity	20%	20
Seminar/ project/ essay	75%	75
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

Ways of evaluating learning outcomes				
	Attendance	**Activity**	**Practical work**	**Total**
Outcome 1		10		10
Outcome 2		10		10
Outcome 3			20	20
Outcome 4			20	20
Outcome 5			35	35
Outcome not-related	5			5
Total	5	20	75	100

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

3.10 Specific features related with taking the course

The student directly takes the exam where he presents and defends the project assignment. A student cannot access the exam without a project assignment. The project is prepared according to the instructions published on the Merlin system and are submitted by placing them on the Merlin. The practical work is submitted at least 3 days before the exam deadline. During the exam, the achieved outcomes are verbally checked.

Students who did not collect points for the assignments in the exercises create additional assignments to make up the points according to the outcomes in agreement with the teacher.

The final grade is obtained on the exam and is the sum of the points achieved during the course and the points obtained for fulfilling the course outcomes, which are assessed by the completed project assignment and verbal examination of independent work.

3.11 Students obligations

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. 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.	
3.12 Written assignments		
3.13 Required reading	1.	
	2.	
3.14 Additional reading	1.	Kevin Tatroe, Peter MacIntyre, Programming PHP: Creating Dynamic Web Pages 4th Edition, O'Reilly, 2020
	2.	
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	IS7 Develop programming code in several programming languages using modern methods and tools IS11 Apply database basics by database creation, modeling, and administration IS13 Develop applications using an object-oriented paradigm in solving program tasks IS17 Select the appropriate programming language and technology when solving programming tasks IS16 Develop web and mobile projects, applying advanced technologies and connecting to databases using modern methods and tools	

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	**Databases II**			
1.2 Study program/s	**Undergraduate professional study of Computer Science**			
1.3 Course status (M,E)	**Electoral**	**1.6 Mode of instruction (number of hours)**	**Lectures**	30
1.4 Course code			**Exercises**	30
1.5 Course abbreviation	PB2		**Seminars**	
1.6 Semester	V		**E-learning**	
1.7 ECTS	4	**1.7 Place and time of instruction**	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	MSc. Željko Knok/ senior lecturer	**contact**	zknok@mev.hr
		contact	
2.2 Assistant/s- title		**contact**	
		contact	
2.3 Instruction held by-title	MSc. Željko Knok/ senior lecturer	**contact**	

3. COURSE DESCRIPTION

3.1 Course goals	After completing the course, the student will be able to implement a database in the information system. Acquires knowledge in the field of object management and data access control based on the MySql database
3.2 Prerequisites	To take the course, it is necessary to pass the course Databases I
3.3 Course outcomes	After successfully completing the course, students will be able to: O1 - Solve difficulties in database operation through models and structures O2 - Create stored tasks (functions, procedures, triggers) O3 - Use permissions and data lock O4 - Evaluate different types of data storage and control
3.4 Course content	The course presents contents related to working with the database through objects, stored tasks, permissions and access controls. In the practical part, open source tools are used.

3.5 Types of coursework

x	Lectures	x	Exercises		Blended e-learning	x	Individual activities		Laboratory
	Seminars and workshops		Distant learning		Field classes	x	Multimedia and network		Mentorship
	Other								

3.6 Language of instruction	Croatian /English

3.7 Monitoring students' work (enter the number of ECTS credits for each activity so that the total number of ECTS credits is equal

1,00	Class attendance		Seminars		Essay
1,00	Class activity		Project		Report/paper
1,00	Midterm exams	1,00	Practical task		Continuous knowledge check
	Written exam		Experimental work		
	Oral exam		Research		

to the total ECTS value of the course, 1 ECTS = 30 hours)

3.8 Assessment and evaluation of students' work during classes and at the final exam

Activity specification	Percent %	Points
Assessment during instruction		
Attendance	5%	5
Class activity	5%	5
Seminar/ project/ essay	30%	30
Midterm exam 1	30%	30
Midterm exam 2	30%	30
Exam assessment for the students who failed to fullfil all the obligatory requirements during the semester		
Written exam	*60%*	*60*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

Ways of evaluating learning outcomes						
	Attendance	**Activity**	**Mid-term exam 1**	**Mid-term exam 2**	**Practical work**	**Total**
Outcome 1			15		10	25
Outcome 2			15		5	20
Outcome 3				15	5	20
Outcome 4				15	10	25
Outcome not-related						10
Total	5	5	30	30	30	100

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

3.10 Specific features related with taking the course

If a student collects 50% of the points of each outcome, he / she directly takes the exam, provided that he / she has done practical work (exercises). A student cannot access the exam period if he / she has not achieved min. 60% correct answers. Practical work-exercises are made according to the instructions published on the Merlin system and are submitted by posting on the Merlin. Checking the completed exercises is done in the exercise classes after prior preparation with the teacher. During the semester, the student is required to perform five exercises independently. Practical work (completed exercises) is taught until the last week of lectures. During the exam, it is possible to orally check the knowledge from practical work (exercises).

If a student does not achieve a sufficient number of points on the midterm exam, 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 did not take the colloquium access the written part of the exam where all learning outcomes are checked, and are required to have completed exercises before taking the exam.

3.11 Students obligations	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. 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.	
3.12 Written assignments		
3.13 Required reading	1.	
	2.	
3.14 Additional reading	1.	
	2.	
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	Apply the acquired learning skills, basic knowledge of the profession and problem solving necessary for continuing studies at a higher level. Use Cloud computing as a concept to access data and applications.	

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	**Digital marketing and advertising**			
1.2 Study program/s	Graduate professional study Management of tourism and sports			
1.3 Course status (O,E)	Obligatory	**1.6 Mode of instruction (number of hours)**	**Lectures**	30
1.4 Course code			**Exercises**	30
1.5 Course abbreviation	DMO		**Seminars**	
1.6 Semester	V.		**E-learning**	
1.7 ECTS	5	**1.7 Place and time of instruction**	The premises of Polytechnic of Medjimurje in Cakovec, according to schedule published on web pages	

2. TEACHING STAFF

2.1 Course leader/s-title	Andrijana Kos Kavran, PhD, High School Professor Sanja Brekalo, PhD, High School Professor	**contact**	akos@mev.hr sbrekalo@mev.hr
		contact	
2.2 Assistant/s- title		**contact**	
		contact	
2.3 Instruction held by- title	Andrijana Kos Kavran, PhD, High School Professor Sanja Brekalo, PhD, High School Professor	**contact**	

3. COURSE DESCRIPTION

3.1 Course goals	After completing the course the student will be able to understand the functioning of different digital channels, their advantages and integration possibilities. By completing this course, students will acquire practical knowledge on how to create and implement a digital campaign, select channels depending on the target user and evaluate the results of the campaign.
3.2 Prerequisites	None.
3.3 Course outcomes	After successfully completing the course, students will be able to: O1 - Explain the process of creating a digital campaign and identify the specifics of websites, Google Ads, Google Analytics, YouTube and Instagram social networks. O2 - Explain the mix of social networks (Facebook, Twitter, LinkedIn) and other digital channels (E-mail, mobile advertising and In-game) for advertising performance based on their values and amount of reach and critically evaluate selected advertising channels in relation to ethical and legal frameworks and default norms for the digital campaign as a whole. O3 - Choose the best digital advertising option using different channels, evaluate the results at the level of each channel of the digital campaign. O4 - Design a complex and multi-channel advertising campaign within the digital marketing plan for the selected company.

3.4 Course content

The course presents content related to digital marketing channels with application to different organizations. The teaching units present contents related to the digital marketing strategy and plan, websites and social networks.

3.5 Types of coursework

x	Lectures	x	Exercises	x	Blended e-learning	x	Individual activities		Laboratory
	Seminars and workshops		Distant learning		Field classes		Multimedia and network		Mentorship
	Other								

3.6 Language of instruction

Croatian/English

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)

1	Class attendance	1	Seminars		Essay
1	Class activity	1	Project		Report/paper
	Midterm exams		Practical task		Continuous knowledge check
2	Written exam		Experimental work		
	Oral exam		Research		

3.8 Assessment and evaluation of students' work during classes and at the final exam

Activity specification	Percent %	Points
Assessment during instruction		
Midterm exam 1	30%	30
Midterm exam 2	30%	30
Exercises	7%	7
Project	30%	30
Class activity	3%	3
Exam assessment for the students who failed to fullfil all the obligatory requirements during the semester		
Written exam	*60%*	*60*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

Ways of evaluating learning outcomes					
	Mid-term exam 1	**Mid-term exam 2**	**Exercises**	**Project**	**Total**
Outcome 1	30				30
Outcome 2		30			30
Outcome 3			7		7
Outcome 4				30	30
Outcome not-related			3		3
Total	30	30	10	30	100

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
91 – 100	excellent (5)
81 – 90	very good (4)
66 – 80	good (3)
51 – 65	pass (2)
0 – 50	fail (1)

3.10 Specific features related with taking

If a student collects 50% of the points of each outcome, he / she directly takes the exam, if he / she has submitted a seminar paper. A student cannot access

the course	the exam if he / she has not submitted a seminar paper. Seminar papers are prepared according to the instructions published on the Merlin system and are submitted by posting on the Merlin. The seminar paper should be submitted at least 3 days before the exam deadline.	
3.11 Students obligations	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. 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.	
3.12 Written assignments	Seminar papers should be computer written and must have a minimum of 10-15 pages of text (Times New Roman, font 12), and an adequate title page, content and marked pages.	
3.13 Required reading		
	1.	Ryan, D. (2014): Understanding Digital Marketing: Marketing Strategies for Engaging the Digital Generation, Kogan Page Limited, London, UK.
3.14 Additional reading	1.	Chaffey D., Ellis-Chadwick F. (2012): Digital Marketing, Pearson Education Limited, Essex, UK.
	2.	
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	- Critically evaluate arguments, assumptions and data in order to form opinions and contribute to solving the problem. - Present information, ideas, problems and solutions to the professional and general public. - Determine the way organizations operate in a changing market environment. IS3 Work in a team, manage professional projects and collaborate with real sector experts IS4 Apply communication and professional ethics IS5 Identify trends in ICT technologies in the domestic and international market IS6 Analyse user needs (investigate and detect data sources, currently present business systems, technological constraints, specifics of the business environment)

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	**Management**			
1.2 Study program/s	Computing			
1.3 Course status (O,E)	O	**1.6 Mode of instruction (number of hours)**	**Lectures**	30
1.4 Course code	5140		**Exercises**	30
1.5 Course abbreviation	MENRAC		**Seminars**	
1.6 Semester	5.		**E-learning**	
1.7 ECTS	5	**1.7 Place and time of instruction**	Polytechnic of Međimurje	

2. TEACHING STAFF

2.1 Course leader/s-title	Mirjana Trstenjak, senior lecturer	kontakt	mtrstenjak@mev.hr
	PhD. Igor Klopotan, senior lecturer		igor.klopotan@mev.hr
	PhD. Josip Nađ, lecturer	**contact**	josip.nad@mev.hr
2.2 Assistant/s- title		**contact**	
		contact	
2.3 Instruction held by- title	Mirjana Trstenjak, senior lecturer PhD. Igor Klopotan, senior lecturer PhD. Josip Nađ, lecturer	**contact**	

3. COURSE DESCRIPTION

3.1 Course goals	Acquiring basic knowledge of software engineering. Introduction to the role and importance of information systems in business. Getting to know the software development life cycle. Introduction to the main functionalities of business information systems. An overview of trends in software engineering and information systems.
3.2 Prerequisites	Object Oriented Programming 1 Data Base 1
3.3 Course outcomes	After successfully completing the course, students will be able to: O1 - Explain the role, functions and tasks of management O2 - Explain the principles of IT project management and accompanying business changes O3 - Use basic managerial skills O4 - Explain basic financial statements and indicators
3.4 Course content	The course presents contents related to the basic principles of management. Examples based on the basic production model are continuously processed. Students have the opportunity to improve their communication, negotiation, prioritization and presentation skills through teamwork. With the help of selected financial indicators, students get a basic tool for assessing the state of the company with regard to the criterion of value creation / destruction.

3.5 Types of coursework	X	Lectures	X	Exercises		Blended e-learning		Individual activities		Laboratory

		Seminars and workshops	X	Distant learning		Field classes		Multimedia and network		Mentorship
		Other								

3.6 Language of instruction	Croatian

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)

1,0	Class attendance	1,0	Seminars		Essay
1,0	Class activity		Project		Report/paper
2,0	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

Activity specification	Percent %	Points
Assessment during instruction		
Attendance	10%	5
Class activity	10%	5
Seminar/ project/ essay	20%	40
Midterm exam 1	30%	25
Midterm exam 2	30%	25
Exam assessment for the students who failed to fullfil all the obligatory requirements during the semester		
Written exam	*60%*	*60*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

Ways of evaluating learning outcomes						
	Attendance	**Activity**	**Mid-term exam 1**	**Mid-term exam 2**	**Practical work**	**Total**
Outcome 1			10		10	20
Outcome 2			20			20
Outcome 3				10	10	20
Outcome 4				20		10
Outcome not-related	10	10				20
Total	10	10	30	30	20	100

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

3.10 Specific features related with taking the course

A student cannot take the exam if he / she has not submitted a seminar paper (analysis of a professional article on a chosen topic) and held an oral presentation. The presentation is done in a teaching term, according to the agreement with the lecturer.

The final grade is obtained on the exam period and is the sum of points earned during classes. Students who did not take the colloquium access the written part of the exam where all learning outcomes are checked.

3.11 Students obligations

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. 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.	
3.12 Written assignments	The seminar paper is submitted in PPT format, electronically.	
3.13 Required reading	1.	
	2.	
	3.	
3.14 Additional reading	1.	Michael Armstrong: How to be an even better Manager; Kogan; 2017.
	2.	Peter F. Drucker: The Essential Drucker; Collins Business Essentials. 2008.
	3.	Harvard Business Review
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	OS3 - Work in a team, manage professional projects and cooperate with experts from the real sector OS4 - Apply communication and professional ethics	

MEĐIMURSKO VELEUČILIŠTE U ČAKOVCU
POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	Computer systems integration			
1.2 Study program/s	Undergraduate professional study of computer engineering			
1.3 Course status (O, E)	Elective course	**1.6 Mode of instruction (number of hours)**	**Lectures**	15
1.4 Course code			**Exercises**	45
1.5 Course abbreviation	IRS		**Seminars**	
1.6 Semester	6th		**E-learning**	
1.7 ECTS	4	**1.7 Place and time of instruction**	Premises of the Polytechnic of Međimurje in Čakovec, according to the schedule published on the website of the Polytechnic	

2. TEACHING STAFF

2.1 Course leader/s-title	Robert Poljak, lecturer	**contact**	robert.poljak@mev.hr
2.2 Assistant/s- title	-	**contact**	-
2.3 Instruction held by-title	Robert Poljak, lecturer	**contact**	robert.poljak@mev.hr

3. COURSE DESCRIPTION

3.1 Course goals	The goal of the course is to prepare students to configure and use Mikrotik RouterOS devices as well as connect these devices with the rest of the network infrastructure.
3.2 Prerequisites	There are no prerequisites for enrolling or finishing the course.
3.3 Course outcomes	After successfully completing the course, students will be able to: I1 - Explain how to use and apply the RouterOS router to manage and limit network traffic I2 - Explain how to use and apply the use of VPN and SNMP I3 - Explain how to use and apply the use of IEEE 802.11 wireless networks I4 - Explain how to use and apply the use of dynamic routing protocols
3.4 Course content	Through lectures and exercises, the course introduces students to ways to use Mikrotik RouterOS devices. The lectures cover various modules of RouterOS software and the technologies used in them. The practical part deals with examples of device configuration through working with real devices and device emulation software.

3.5 Types of coursework

X	Lectures	X	Exercises		Blended e-learning	X	Individual activities		Laboratory
	Seminars and workshops	X	Distant learning		Field classes		Multimedia and network		Mentorship
	Other								

3.6 Language of instruction	Croatian/English

3.7 Monitoring students' work (1 ECTS = 30 hours)

2	Class attendance		Seminars		Essay
	Class activity		Project		Report/paper
1	Midterm exams	2	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

Activity specification	Percent %	Points
Assessment during instruction		
Midterm for the practical part	70%	70
Midterm for the theoretical part	30%	30
Exam assessment for the students who failed to fulfil all the obligatory requirements during the semester		
Oral exam	*100%*	*100*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

	Practical part	Theoretical part	Total
Outcome 1 (I1)	35		35
Outcome 2 (I2)	35		35
Outcome 3 (I3)		10	10
Outcome 4 (I4)		10	10
Outcome 5 (I5)		10	10
Total	70	30	100

To condition for successfully passing the course is having achieved at least 50% of the points in each learning outcome.

Criteria for achieving the grade	
Points	**Grade**
89 - 100	Excellent (5)
76 - 88	Very good (4)
63 - 75	Good (3)
50 - 62	Pass (2)
0 - 49	Fail (1)

3.10 Specific features related with taking the course

For a student to pass the course, he/she must earn a minimum of 50% of the points available for that learning outcome for EACH learning outcome.
The final grade is obtained on the exam period and is the sum of points earned during classes. Students who did not complete the midterm exam must attend the oral exam where all learning outcomes are checked.

3.11 Students obligations

Full-time students are required to attend at least 70% of the total number of hours of lectures and exercises 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 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.
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.

3.12 Written assignments	Seminar papers must be computer written and must have between 8 and 12 text cards (font Calibri, size 12) from introduction to conclusion, together with pictures, tables, etc. Seminar papers must have an adequate title page, table of content, numbered pages and list of literature used. The seminar paper should be divided into chapters and contain a list of references, a list of figures, tables, and graphs and a summary / conclusion containing 250 words. The student guarantees the authenticity of the work with his signature.	
3.13 Required reading	1.	Tyler Hart - Networking with MikroTik, MTCNA Study Guide, First Edition (2017.)
3.14 Additional reading	1.	Stephen R.W. Dischер - RouterOS by Example (2011.)
	2.	Web site https://wiki.mikrotik.com/wiki/Main_Page
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	**IS10** Distinguish types and communication protocols of computer networks **IS18** Apply standards, methods, and techniques to analyse security threats and defend against them **IS19** Use tools and methods for planning, building, and maintaining computer networks based on wired or wireless communication media **IS20** Install, configure, and manage specific operating systems and network services in complex network environments	

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION				
1.1 Course name	Development of computer games			
1.2 Study program/s	Undergraduate professional studies Computer science			
1.3 Course status (O,E)	E	**1.6. Method of teaching (number of hours)**	**Lectures**	30
1.4 Course code			**Exercise**	30
1.5 Course abbreviation	RRI		**Seminar**	-
1.6 Semester	VI.		**E-learning**	
1.7 ECTS	4	**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	Nenad Breslauer, senior lecturer	**Contact**	nbreslauer1@mev.hr
		Contact	
2.2 Assistant/s- title		**Contact**	
		Contact	
2.3 Instruction held by-title	Nenad Breslauer, senior lecturer	**Contact**	

3. COURSE DESCRIPTION	
3.1 Course goals	After a registered course, the student will learn to use the platform to develop computer games, whereby students will receive the knowledge needed to develop simple 3D and 2D computer games. Students will master using the platform to develop computer games kroz linking concepts related to the use of finished 2D and 3D content with the knowledge of software development. The acquired skills and knowledge of the development of computer games will be upgraded with knowledge enabling the creation of virtual and augmented reality systemsi. Special attention will be paid to the creation of educational 3D games within virtual and augmented reality and the design of the user interface and interaction within them. Students will learn to use modern platforms for the development of computer games (Unity Game engine, program languageC#) and equipment for virtual and augmented reality systems.
3.2 Prerequisites	There are no conditions.
3.3 Course outcomes	After a successfully mastered course, students will be able to: I1 - Explain what a platform for developing computer games is and what are the basic benefits of its use. I2 - Build a space within which interaction between objects (participants) takes place. I3 - Build mechanisms to simulate physical laws. I4 - Design and create program scripts within the computer game development platform. I5 -Assemble a more sophisticated virtual and/or augmented reality system.

3.4 Course content

Thematic units will be processed, which include different areas of development and creation of computer games, the creation and use of graphic elements and the implementation of theirh behaviors.

3.5 Types of coursework

X	Lectures	X	Exercises		Blended e-learning	X	Individual activities		Laboratory
x	Seminars and workshops		Distant learning		Field classes		Multimedia and network		Mentorship
	Other								

3.6 Language of instruction

Croatian

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)

1	Class attendance		Seminars		Essay
1	Class activity	2	Project		Report/paper
	Midterm exams	1	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

Activity Specification	Percentage %	Score
Evaluation during class		
Presence in class	15%	15
Activity in Class	15%	25
Seminar work/ project/ essay	70%	60
Evaluation of exam work for students who did not co-late		
Written exam	*60%*	*60*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

Ways of evaluating learning outcomes				
	Attendance	**Activity**	**Project**	**Total**
Outcome 1			14	14
Outcome 2			14	14
Outcome 3			14	14
Outcome 4			14	14
Outcome 5			14	14
Outcome not-related	15	15		40
Total	**15**	**15**	**70**	**100**

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

3.10 Specific features related with taking the course

If the student collects 50% of the points of each outcome directly access orally exam. If a student does not achieve a sufficient number of points on the midterm exam, he cannot take the next midterm exam.

Once won 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. A student cannot access the exam period if he / she has not submitted and presented seminar paper. The final grade is obtained on the oral part of the exam. 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. 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.	
3.11 Students obligations	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. Attendance can be offset by online consultations, organized 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 the event that a student is absent from more than 50% of classes, and has a justifiable reason / apology, a 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.	
3.12 Written assignments	Seminar papers must be computer written and may have a maximum of 12 text cards (Times New Roman, font 12) from introduction to conclusion, together with pictures, table appendices, etc. Seminar papers must have an adequate title page, content, marked pages and literature. The seminar paper should be divided into chapters and contain a list of references and a list of figures and tables and graphs and finally a summary / conclusion in the size of 250 words. The student guarantees the authenticity of the work with his signature.	
3.13 Required reading	1.	Thorn, A.: Unity 5.x By Example, Packt publishing,2016
	2.	
	3.	
3.14 Additional reading	1.	Materials on the e-learning system (moodle.srce.hr)
	2.	Felicia P.: Unity 5 From zero to Proficiency (Foundations),2015.
	3.	Norton, T.; Learning C# by Developing Games with Unity 3D, Packt publishing,2013.
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	Identify trends in ICT technologies on the domestic and international market. Apply communication and professional ethics. Identify the basic specifics of operating systems . Develop applications using object-oriented paradigms to solv program tasks Choose the rightprog ram language and technology when solving program tasks Develop web and mobile projects, using advanced technologies and connect to databases using modern methods and tools

POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

1. GENERAL COURSE INFORMATION

1.1 Course name	**Pattern recognition**			
1.2 Study program/s	**Undergraduate professional study of Computer Science**			
1.3 Course status (O,E)	**Electoral**	**1.6 Mode of instruction (number of hours)**	**Lectures**	30
1.4 Course code			**Exercises**	30
1.5 Course abbreviation	RU		**Seminars**	
1.6 Semester	VI		**E-learning**	
1.7 ECTS	4	**1.7 Place and time of instruction**	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	MSc. Željko Knok/ senior lecturer	**contact**	zknok@mev.hr
		contact	
2.2 Assistant/s- title		**contact**	
		contact	
2.3 Instruction held by-title	MSc. Željko Knok/ senior lecturer	**contact**	

3. COURSE DESCRIPTION

3.1 Course goals	After completing the course, the student will be able to use Python to recognize patterns. Knowledge in the field of artificial intelligence and machine learning is acquired
3.2 Prerequisites	Knowledge of the Python programming language is desirable for taking the course, but it is not necessary
3.3 Course outcomes	After successfully completing the course, students will be able to: O1 - Prepare tools for machine learning and pattern recognition O2 - Identify data sources required for machine learning O3 - Solve simple linear regression and classification tasks, clustering using Python programming language O4 - Solve simple tasks using a simple neural network and decision tree
3.4 Course content	The course presents contents related to the concept, possibilities and role of the database. Special attention is given to data search using SQL language, modeling and database maintenance. In the practical part, open source tools are used.

3.5 Types of coursework

x	Lectures	x	Exercises		Blended e-learning	x	Individual activities		Laboratory
	Seminars and workshops		Distant learning		Field classes	x	Multimedia and network		Mentorship
	Other								

3.6 Language of instruction	Croatian /English

3.7 Monitoring students' work (enter the number of ECTS credits for each

1,00	Class attendance		Seminars		Essay
	Class activity		Project		Report/paper
2,00	Midterm exams	1,00	Practical task		Continuous knowledge check

activity so that the total number of ECTS credits is equal to the total ECTS value of the course, 1 ECTS = 30 hours)		Written exam		Experimental work		
		Oral exam		Research		

3.8 Assessment and evaluation of students' work during classes and at the final exam

Activity specification	Percent %	Points
Assessment during instruction		
Attendance	5%	5
Class activity	5%	5
Seminar/ project/ essay	30%	30
Midterm exam 1	30%	30
Midterm exam 2	30%	30
Exam assessment for the students who failed to fullfil all the obligatory requirements during the semester		
Written exam	*60%*	*60*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

Ways of evaluating learning outcomes						
	Attendance	**Activity**	**Mid-term exam 1**	**Mid-term exam 2**	**Practical work**	**Total**
Outcome 1			15		10	25
Outcome 2			15		5	20
Outcome 3				15	5	20
Outcome 4				15	10	25
Outcome not-related						10
Total	5	5	30	30	30	100

Grading of outcomes (in order to pass the mid-term exam/exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
89 – 100	excellent (5)
76 – 88	very good (4)
63 – 75	good (3)
50 – 62	pass (2)
0 – 49	fail (1)

3.10 Specific features related with taking the course

If a student collects 50% of the points of each outcome, he / she directly takes the exam, provided that he / she has done practical work (exercises). A student cannot access the exam period if he / she has not achieved min. 60% correct answers. Practical work-exercises are made according to the instructions published on the Merlin system and are submitted by posting on the Merlin. Checking the completed exercises is done in the exercise classes after prior preparation with the teacher. During the semester, the student is required to perform five exercises independently. Practical work (completed exercises) is taught until the last week of lectures. During the exam, it is possible to orally check the knowledge from practical work (exercises).

If a student does not achieve a sufficient number of points on the midterm exam, 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 did not take the colloquium access the written part of the exam where all learning outcomes are checked, and are required to have completed exercises before taking the exam.	
3.11 Students obligations	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. 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.	
3.12 Written assignments		
3.13 Required reading	1.	Zsolt Nagy, Artificial Intelligence and Machine Learning Fundamentals 1st Edition, 2018.
3.14 Additional reading	1.	https://scikit-learn.org/stable/auto_examples/index.html#examples
	2.	https://jakevdp.github.io/PythonDataScienceHandbook/index.html
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	Apply the acquired learning skills, basic knowledge of the profession and problem solving necessary for continuing studies at a higher level. Apply relevant mathematical and statistical methods in software engineering.	