Append	lix 3.	Program	of the Co	ourse for First cyc	le s	tudies			
1.	Title of C	ourse		Fundamentals o	f co	mputer programming	j		
2.	Code			2FI100221					
3.	Study pro	ogram		Computer Engineering and Technologies					
4.	Organize program	er of the	Study	Goce Delchev University – Stip Faculty of computer science					
5.		st, second	or third	First cycle					
6.		c year/ sem	ester	1/1	7.	Number of ECTS		6	
1.	Professo	r (s)		Prof. Vlado Gice	٧			I	
2.	Requiren	nents for e	nrolling	none					
3.	Gain theo program	ming langua	practica age. Acq	I knowledge in th		eld of structural progr for solving problems,			
4.	structures selection, loop, recursion. Functions and function types. User defined data types. Structural vs simple data types. Records. Arrays. Multidimensional arrays.								
5.									
6.		•	ilable tim	e: 6 EKTS x 30 h	our	s = 180 hours			
7.	Distributi	on of availa	ble time:	30+30+30+30+6	50 = ⁻	180 hours (2+2+1)			
8.		teaching/	15.1	Lectures / theoretical, contact teaching, e-learning			30 hours		
_	learning		15.2	Exercises (prac	ctical, laboratory, ars, teamwork)	30 hours		
			16.1	Projects			30 hours		
9.	Other f activities	forms of	16.2	Individual worl	(30 ho	ours
	[16.3	Home learning	J			60 ho	ours
	Method assessm	of ent							
10.	17.1	Tests / Ora	al Exam		7	0 scores			
	17.2	Individual projects, p	work ractical)	(presentation	' 1	0 scores			
	17.3	Activity an	d particip	pation	2	0 scores			
					u	p to 50 points	5	(five)	(F)
11.	Assass	ent Criteria	(scorec)	(noints)	5	1 to 60 points	6	(six)	(E)
	73363311		(300103/		6	1 to 70 points	7	(seven)	(D)
					7	1 to 80 points	8	(eight)	(C)

				81 to 90 points	9 (nine)	(B)		
				91 to 100 points	10 (ten)	(A)		
12.	Signature app exam/ or trans		nd entrance to the final the next year	Gaining at least 42 out of 70 points from activities during the semester from which: 40 points from midterm exams, 10 points from project and 20 points from presence on lectures and discussions.				
13.	Language of te	eaching	/ study	English				
14.	Methods of me of teaching	easuring	/ monitoring the quality	Self evaluation				
	Literature							
		Basic I	iterature					
	22.1	No	Author	Title	Publisher	Year		
15.		1.	Dale, N., Weems, C., Headington, M	Programming and Problem Solving with C++	Jones and Bartlett Publishers	2000		
		2.						
		3.						
	22.2	Additic	nal literature					
		No	Author	Title	Publisher	Year		
		1.						

Append	lix 3.	Program of the Co	urse for First cycl	e stu	dies			
1.	Title of Co	ourse	Mathemetics 1					
2.	Code		2FI100121					
3.	Study prog	gram	Computer Engin	eerir	ng and Technologies			
4.	Organizer program	of the Study	Goce Delchev U Faculty of comp					
5.	Level (firs	st, second or third sudies)	First cycle					
6.	Academic	year/ semester	First year/ first semester	7.	Number of ECTS	8		
8.	Professor	(s)	Prof. Tatjana Atanasova Pachemska, full professor					
9.	Requirem the course	ents for enrolling	Enrolment in the first cycle of studies of the study program					
10.	Aims of the course (competences): To adopt the basic concepts and tools of matrix calculus and applications, vector algebra, sequences and functions, differential calculus of a real function of one real variable that are necessary for mathematical							
11.	Contents	of the course (per 1	5 weeks per seme	ester):			

1. Matrices and determinants. Application – solving systems of n -linear equations with n variables; 2. Vector algebra - definition of a vector, coordinate representation, operations with vectors, linear dependence and independence, scalar, vector and mixed product, matrix representation and applications; 3. Analytical geometry in real 3-D space - point, line, plane, basic equations, mutual position and applications; 4. Numerical sets - natural, whole, rational numbers, mathematical induction; 5. Real numbers – definition, absolute value of a real number, distance, intervals, open and closed sets, environments - equations and inequalities in the set of real numbers: 6. Real sequence - definition, construction, notion of convergence of a real sequence, criteria for convergence: 7. Real sequence - Properties of convergent sequences, operations with convergent sequences, divergent sequences: 8. Special sequences – arithmetic and geometric progression, the number e, subsequence; 9. Real functions of one variable - definition, properties, graph of a function, classes of elementary functions and graphs 10. Real functions - concept of limit value of a function; procedures for determining the limit value of a function, continuity and breakpoints. Asymptotes of a function, Application 11. Fundamentals of differential calculus – definition of the derivative of a function with one real variable, geometric and physical interpretation, differentiable functions and rules of differentiation, application intervals of monotonicity 12. Basic theorems of differential calculus - theorem of Lopital, Lagrange, Rolle, Mean value theorem, Taylor's polynomial, approximation of functions with polynomials 13. Derivatives and higher order differentials. Application of derivatives - definition and types of extrema of a function with one real variable, way of determining extrema using derivatives. Other characteristic points (folds) of a function. Geometric interpretation 14. Examining flow and drawing a graph of a function with one real variable: 15. Applications – drawing graphs using computer program packages Methods of learning: Lectures, exercises, preparation of a seminar paper and presentations, teaching with 12. using ICT 13. Total amount of available time: 8 ECTS x 30 hours = 240 hours 14. Distribution of available time: 45+30+30+60+75 = 240 hours (3+2+2) Lectures / theoretical, contact teaching, 15.1 45 Forms of teaching / e-learning 15. learning activities Exercises (practical, laboratory. 30 15.2 theoretical, seminars, teamwork) 16.1 Projects 30 Other forms of 16.2 16. Individual work 60 activities 16.3 75 Home learning Method of assessment 17.1 Tests / Oral Exam 70 scores 17. Individual work (presentation, 17.2 10 scores projects, practical) 17.3 Activity and participation 20 scores up to 50 points 5 (five) (F) 6 (E) 51 to 60 points (six) 18. Assessment Criteria (scores/ points) 7 61 to 70 points (D) (seven) 71 to 80 points 8 (C) (eight)

				81 to 90 points	9 (nine)	(B)		
				91 to 100 points	10 (ten)	(A)		
19.	Signature app exam/ or trans		nd entrance to the final ne next year	Apart from 42 points from partial exams, completed homework and regularity of lectures, classroom exercises and laboratory exercises				
20.	Language of te	eaching /	study	English				
21.	Methods of me teaching	easuring	/ monitoring the quality of	Self-evaluation, period	lic tests, debates			
	Literature							
		Basic	literature					
		No	Author	Title	Publisher	Year		
22.	22.1	1.	Т. А. Пачемска, Л. Лазарова	Математика (the book will be translated in English)	Универзитет "Гоце Делчев" - Штип	2013		
		2.	М. Меркле	Математичка анализа	Рачунарски факултет- Београд	2006		
		3.	Глин Џејмс	Математика на модерен инженеринг	преводи од Влада на РМ	2009;		
	22.2	Additio	onal literature					
		No	Author	Title	Publisher	Year		
		1.						

Annex	x 3.	ourse for First c	ycle	studies				
1.	^{1.} Title of Course		Introduction to	Introduction to informatics				
2.	Code		2FI100421	2FI100421				
3.	Study progr	am	Computer engineering and technologies					
4.	Organizer o program	Goce Delchev University – Stip Faculty of informatics						
5.	Level (first, cycle of stue	second or third dies)	First cycle					
6.	Academic y	ear/ semester	1 year / I semester	7.	Number of ECTS	6		
7.	Professor (s	S)	Prof. Natasha Koceska					
8.	Requirement the course	nts for enrolling	None	None				

		e course (co			situation and future; th	ne way th	at computers			
9.	operate; concerned operate; computer	omputer cor viruses, stru	nponents; cture of the	data transmissio e Internet, Intern	on; defining computer r let protocols, addressin bages, basics of HTML	networks, ng, techno	network topc plogy for voic	ology,		
10	This cours - History o - Hardward - Software - Compute - Internet: - Compute	Contents of the course (per 15 weeks per semester): This course covers the following topics: - History of computers and programming languages - Hardware: peripheral devices, memory - Software: operating systems, software types - Computer network: network types, topology, OSI model, TCP/IP model, protocols - Internet: structure of the Internet, Internet protocols and services. - Computer viruses - Multimedia - VoIP								
11	Methods of learning: Lectures, Discussions, Labs, Numerical exercises, e-learning, individual and team projects, office hours									
12										
13	Distributio	n of availabl	e time: 30-	+30+30+30+60 =	= 180 hours (2+2+1)					
14	Forms of t		15.1	teaching, e-lea		30 hours				
	learning a	ctivities	15.2		ctical, laboratory, minars, team work)	30 hou				
			16.1	Projects		30 hou				
15	Other form activities	is of	16.2	Individual work			ſS			
10			16.3	Home learning		60 hou	Ϋ́ς			
16	Method of assessme									
	17.1	Tests / Ora					70	0 points		
17	17.2	Individual projects, p		entation,			10	0 points		
	17.3	Activity an	d participa	tion		-	20	0 points		
					up to 50 points	5	(five)	(F)		
					51 to 60 points	6	(six)	(E)		
18	Assessme	nt Criteria (s	scores/ poi	nts)	61 to 70 points	7	(seven)	(D)		
	, 1000001110		100100, poi		71 to 80 points	8	(eight)	(C)		
					81 to 90 points	9	(nine)	(B)		
					91 to 100 points	10	(ten)	(A)		
19		approval an ransition in t		e to the final ear	60% active participa	tion at the	course			
20	Language	of teaching	/ study		English					
21	Methods of teaching		/ monitori	ng the quality	Standardized tests, Self-evaluation	observatio	on, survey			
	Literature									

		Basic	literature			
		No	Author	Title	Publisher	Year
22 _{22.1}		1.	Natasha Koceska	Интернет технологии	Универзитет ,,Гоце Делчев" - Штип.	2013
	2. Natasha Koceska Vlatko Jovanovski		Практикум по Интернет технологии	Универзитет ,,Гоце Делчев" - Штип.	2013	
		3.	Douglas Comer	Internetworking with TCP/IP- Principles, Protocols and Architectures	Prentice Hall,	2000.
	22.2	Addit	ional literature			
		No	Author	Title	Publisher	Year
		1.	Timothy J. O'Leary, Linda I. O'Leary, Daniel A. O'Leary	Computing Essentials 2015, Complete Edition	McGraw-Hill Education	2003
			Peter J. Denning, Craig H. Martell	Great Principles of MIT Press Computing		2015
		3.				

Append	dix 3.	Program of the C	ourse for First cy	cle :	studies			
1.	Title of Co	ourse	Fundamentals of Electrical Engineering					
2.	Code		2FI100321					
3.	Study pro	ogram	Computer Engi	neer	ing and Technologies			
4.	Organize program	r of the Study	Goce Delchev Faculty of com					
5.		st, second or third tudies)	First cycle					
6.	Academic	c year/ semester	First year / I semester	7.	Number of ECTS	6		
1.	Professor	r (s)	Ass. Professor Mirjana Kocaleva Vitanova					
2.	Requirem the cours	nents for enrolling	None					
3.	theorems		ectric circuits an		with basic terms and pheno ethods for the analysis of e			
4.	Electric ve for Comp Alternatin	Contents of the course (per 15 weeks per semester): Electrostatics. Electric field. Coulomb's law. Electric voltage. Capacitors and their connection in series and parallel. Direct currents. Kirchhoff's Laws for Complex Electric Circuits. Methods for solving electric circuits. Electromagnetism. Magnetic circuit. Alternating currents. Solving electrical circuits connected to alternating voltage in series, parallel and series-parallel connection of resistors, capacitors, and coils. Tesla multiphase electric circuits. Three-						

					cted in star and ti netic field.	riangle. Electric power	in a three-phase	system. Creation		
5.					es, theoretical a roject; home stud	and practical exercise	s, consultations	s; creation of an		
6.						ours = 180 hours				
7.	Distribut	tion of ava	ailab	le time: 3	30+30+30+30+60	0 = 180 hours (2+2+1)				
8.	Forms of	of teachin	ig 1	15.1	Lectures / teaching, e-lear	theoretical, contact 30 hours				
	/ learnin	g activitie		15.2		actical, laboratory, ninars, teamwork)	30 hours			
			1	16.1	Projects		30 hours			
9.	Other activities		of 1	16.2	Individual work		30 hours			
				16.3	Home learning		60 hours			
	Method assessn		of							
. 10.	17.1	Tests /	Oral	Exam		70 scores				
	17.2	Individu projects		work actical)	(presentation,	10 scores				
	17.3	Activity	and	participa	ation	20 scores				
						up to 50 points	5 (five)	(F)		
•						51 to 60 points	6 (six)	(E)		
11.	A		riteria (scores/ points)			61 to 70 points	7 (seven)	(D)		
	Assessi	nent Crite				71 to 80 points	8 (eight)	(C)		
						81 to 90 points	9 (nine)	(B)		
						91 to 100 points	10 (ten)	(A)		
12.		re approv r transitio			nce to the final year	60% active participation at the course				
13.	Langua	ge of teac	ching	/ study		English				
14.	Methods of teach		uring	g / monite	oring the quality	Self-evaluation				
	Literatur									
•		В	asic	literature	9					
		N	lo	Autho	r	Title	Publisher	Year		
15.	22.1	1.			es A. Gross eus A. Roppel	Fundamentals of Electrical Engineering	CRC Press	2012		
		2.	•	Giorgi	o Rizzoni	Fundamentals of Electrical Engineering	McGraw-Hill	2009		
	22.2	A	dditi	onal liter	ature					

No	Author	Title	Publisher	Year
-				

Appen	dix 3.	Program of the Co	ourse for First cycl	e stu	dies			
1.	Title of Cou	irse	English languag	e lev	el A2.1			
2.	Code		4FF100621					
3.	Study prog	ram	Computer Engi	Computer Engineering and Technologies				
4.	Organizer o program	of the Study	Goce Delchev L Faculty of comp		• •			
5.		second or third idies)	First cycle					
6.	Academic year/ semester		First year / First semester	7.	Number of ECTS	4		
8.	Professor (s)	Dragan Donev					
9.	Requireme the course	nts for enrolling	None					
10.								
11.	Vocabulary	•	ncluding: number	s, col	ours, classroom objects, f jobs, rooms, things in the	•		

star signs, foods, containers, weather, seasons, months, feelings, clothes, parts of the body, animals, sports, sport equipment, travelling, natural features. Grammar: Basic grammar: verb to be, articles - a/an, this/that, guestion words, have got, possessive case/pronouns/adjectives, present simple, love/like + ing, prepositions of time, adverbs of frequency, there is/are, plurals, prepositions of place, imperative, countable/uncountable nouns, some/any/much/many/a lot of, present continuous, comparisons, ordinals, past simple (regular verbs), used to, had, past simple (irregular verbs), future simple, be going to, present continuous for future arrangements, modal verbs (can, could, must, mustn't should, shouldn't), present perfect, superlatives. All communicative skills are equally included in the course including basic communication: spelling names, exchanging phones, talking about counties and nationalities, greetings and introductions, describing physical appearances and character, talking about abilities, asking for and offering help, talking about daily routines, preferences, jobs, telling time, talking about houses and locations, giving directions, talking about food preferences and preparing food, giving advice, , making predictions about the future, talking about plans and intentions, talking about travelling and personal experiences, etc. The students will acquire basic knowledge of English culture. Methods of learning: Interactive method: group work, reports, homework, seminar papers, discussion, debate, cooperative 12. studying techniques, individual tasks, simulation of extra-curricular educational activities, individual studying. 13. Total amount of available time: 120 14. Distribution of available time: 2+1+1 Lectures / theoretical, contact 15.1 30 hours Forms of teaching / teaching, e-learning 15. learning activities Exercises (practical, laboratory, 15. ours 15.2 theoretical, seminars, team work) 16.1 15 hours Projects Other forms of 16.2 Individual work 30 hours 16. activities 30. ours 16.3 Home learning Method of assessment Tests / Oral Exam 70 scores 17.1 17. Individual work (presentation, 17.2 10 scores projects, practical) 17.3 Activity and participation 20 scores up to 50 points 5 (five) (F) 51 to 60 points 6 (six) (E) 7 61 to 70 points (D) (seven) 18. Assessment Criteria (scores/ points) 71 to 80 points 8 (eight) (C) 81 to 90 points 9 (nine) (B) (A) 91 to 100 points 10 (ten) Signature approval and entrance to the final 19. 60% active participation at the course exam/ or transition in the next year

20.	Language of tea	ching / s	tudy	English				
21.	Methods of mea teaching	suring / r	monitoring the quality of	Standardized motor tests, observation, survey Self-evaluation				
	Literature							
		Basic I	iterature	•				
		No	Author	Title	Publisher	Year		
22.	22.1	1.	VIRGINIA EVANS - JENNY DOOLEY	Upstream Elementary A2	Express Publishing	2006		
	2.	2.	Clive Oxenden and Christina Latham- Koenig	New English File Beginner	Oxford University Press	2011		
		3.						
	22.2	Additic	onal literature	•				
		No	Author	Title	Publisher	Year		
		1.	Zoze Murgoski	English Grammar: With Contrastive Notes on Macedonian	National and University Library Kliment Ohridski	1997		
		2.						
		3.						

Appen	ıdix 3.	Program of the C	ourse for First cy	cle s	tudies			
1.	Title of Course		French language level A1.1					
2.	Code		4FF100521					
3.	Study program		Computer Engi	Computer Engineering and Technologies				
4.	Organizer of the Study program		Goce Delchev University – Stip Faculty of computer science					
5.	Level (first, second or third cycle of studies)		First cycle					
6.	Academic y	vear/ semester	First year / First semester	7.	Number of ECTS	4		
8.	Professor (s)	Svetlana Jakimo	ovska	a			
9.	Requirement the course	nts for enrolling	None					
10.	Aims of the course (competences): At the end of the course the student is expected to: - understand and use familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concrete type;							

	- introduce him	n/herself a	nd others and can ask and answer ques	tions about personal				
	details such a	as where t	they live, people they know and things th	ey have;				
	 interact in a simple way provided the other person talks slowly and clearly and is prepared to help; 							
	 identify himself and answer questions concerning, for example, his nationality, his age, his place of residence, his date of birth, his school and possibly, to ask himself questions of this type to somebody; 							
	 recognize names, the most common words or expressions in simple situations of the everyday life: signs, handwritten indications doubled by icons, prices, schedules; 							
	- spot and und a short text;	erstand q	uantified data, proper nouns and other ve	ery simple information in				
		• •	r aspect, their typography, their localizati of the daily environment or the school env					
	 write a very simple message concerning the activities of the daily life containing some personal details. 							
11.	 Contents of the course (per 15 weeks per semester): <i>Vocabulary:</i> Basic vocabulary including: numbers, colours, classroom objects, family-related words, appearance, character adjectives, everyday activities, jobs, rooms, things in the house, buildings, foods, containers, months, parts of the body. <i>Basic grammar structures</i>: correct pronunciation of French, verbs <i>être/avoir</i>, articles, question words, pronouns, adjectives, present simple, prepositions of time, adverbs of frequency, plurals, prepositions of place. All communicative skills are equally included in the course including basic communication: communicate, in a very simple way; talking about counties and nationalities, greetings and introductions, describing physical appearances and character, talking about abilities, asking for and offering help, talking about daily routines, preferences, telling time, talking about houses and locations, etc. 							
12.	Methods of learning: Interactive method: g	roup work technique	knowledge of French culture. , reports, homework, seminar papers, dis , individual tasks, simulation of extra-cu					
13.	Total amount of avail	able time:	120					
14.	Distribution of availab	ole time: 2	+1+1					
15.	Forms of teaching /	15.1	Lectures / theoretical, contact teaching, e-learning	30 hours				
10.	learning activities	15.2	Exercises (practical, laboratory, theoretical, seminars, team work)	15. hours				
		16.1	Projects	15 hours				
16.	Other forms of activities	16.2	Individual work	30 hours				
		16.3	Home learning	30. hours				

	Method of assessme							
17.	17.1	Tests / Oral	Exam	70 scores				
	17.2	Individual wo projects, pra	ork (presentation, ctical)	10 scores				
	17.3	Activity and	participation	20. scores				
		•		up to 50 points	5	(five)	(F)	
				51 to 60 points	6	(six)	(E)	
18.	A	ant Critaria (aa	61 to 70 points	7	(seven)	(D)		
10.	ASSESSIL	ent Criteria (sc		71 to 80 points	8	(eight)	(C)	
				81 to 90 points	9	(nine)	(B)	
				91 to 100 points	10	(ten)	(A)	
19.	U U	approval and ransition in the	entrance to the final e next year	60% active participation at the course				
20.	Language	of teaching / s	study	English and French				
21.	Methods of teaching	-	monitoring the quality	Standardized motor tests, observation, survey Self-evaluation				
	Literature							
		Basic	literature					
		No	Author	Title	Publish	er	Year	
22.	22.1	1.	CAPELLE, G. & MENAND,R.	Taxi 1 (Méthode de français)	Edilingu	ıa	2003	
		2.	CAPELLE, G. & MENAND,R.	Taxi 1 (Cahier des exercices)	Edilingu	Ja	2003	
		3.						
	22.2	Additio	onal literature					
		No	Author	Title	Publish	er	Year	
		1.						
		2.						
		3.						

Appendix 3. Program of the C			Course for First cycle studies
^{1.} Title of Course		urse	German language level A1.1
2.	^{2.} Code		4FF100221
3.	^{3.} Study program		Computer Engineering and Technologies

4.	Organizer of the Stud		Goce Delchev University – Stip Faculty of computer science					
5.		r third	First cycle	Juici				
6.	Academic year/ sem	ester	First year / First semester	7.	Number of ECTS		4	
8.	Professor (s)		Lecturer MA M	arica	Tasevska			
9.	Requirements for en the course	rolling	None					
10.	Aims of the course (competences): Students to be able to conduct short dialogues when meeting, greeting, to express opinions on everyday topics, to find an unknown city, to communicate with people from German-speaking countries, to shop in Germany, to make recommendations, to describe and express specific opinions, to get acquainted with the culture and civilization in the German-speaking countries, etc.							
11.	Contents of the course (per 15 weeks per semester): <i>Grammar:</i> verbs and conjugation of verbs (haben, sein, kommen, sprechen, fahren, schlafen, sehen) question words (wer, wo, woher, wie,) personal pronouns (accusative and dative), possesive pronouns (nominative and accusative), definite / indefinite article, separable verbs, adverbs in time (accusative and dative), question sentences, modal verbs (mögen, können, wollen, dürfen, sollen, müssen), perfect (past tense), imperative (ordering, adverbs of place, modality (könnten, würden + infinitiv), comparative and conjugative adjectives (viel, gern, gut), verbs with dative, conjunctions for independent sentences (und, oder, aber, de nn), ordinal numbers.							
12.	Methods of learning: Interactive method: g cooperative studying activities, individual s	techniqu	-					
13.	Total amount of avai	lable time	: 120					
14.	Distribution of availal	ble time: 2	2+1+1	_				
15.	Forms of teaching /	15.1	Lectures / the teaching, e-le	arnir	g		30 hours	
	learning activities	15.2	Exercises (pratical, se		al, laboratory, ars, team work)	15	5. hours	
r i		16.1	Projects		•			
16.	Other forms of	10.1	FIUJECIS				15 hours	

		Г	16.3	Home learning		30. hours					
	Method of assessme			<u> </u>		<u> </u>					
17.	17.1	Tests / Ora	al Exam		70 scores						
	17.2	Individual v projects, p		esentation,	10 scores						
	17.3	Activity and	d particip	pation	20. scores						
					up to 50 points	5 (five)	(F)				
	l				51 to 60 points	6 (six)	(E)				
					61 to 70 points	7 (seven)	(D)				
18.	Assessme	ent Criteria (scores/ p	points)	71 to 80 points	8 (eight)	(C)				
					81 to 90 points	9 (nine)	(B)				
					91 to 100 points	10 (ten)	(A)				
19.	Signature approval and entrance to the final exam/ or transition in the next year				60% active participat	ion at the course					
20.	Language of teaching / study				English and German						
21.	Methods of measuring / monitoring the quality of teaching				Standardized motor tests, observation, survey Self-evaluation						
	Literature										
		Basi	c literatu	re	·						
		No	Autho	or	Title	Publisher	Year				
			1.	Hilper Reim	n Kerner, Silke rt, Monika ann,Andreas szewski	Schritte International 1 Kusrbuch + Arbeitsbuch	Hueber Verlag	2006			
22.	22.1	2.		erike Jin, Ute	Grammatik aktiv Üben, Hören, Sprechen	Cornelsen	2018				
				а Грчева о Рау	Голем македонско- германски и германско- македонски речник	Магор	2006				
	22.2	Addi	tional lite	erature							
		No									
		1.	Дими	трија Гацов	Германска Граматика	НУБ "Климент Охридски" - Скопје	1995				
		2.	Pude	s Sandra, Angela, cht Franz	Menschen A1.2	Hueber Verlag	2012				

3.	Olga Swerlowa	Grammatik & Konversation Arbeitsblätter für den Deutschunterricht A1-A2-B1	Langenscheid	2013
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Apper	ndix 3.	Program of the C	ourse for First cy	cle st	udies			
1.	Title of Cou	urse	Italian language	Italian language level A1.1				
2.	Code		4FF100421					
3.	Study prog	Study program		ineer	ing and Technologies			
4.	. Organizer of the Study program		Goce Delchev I Faculty of comp					
5.	Level (first, cycle of stu	, second or third udies)	First cycle					
6.	,		First year / First semester	7.	Number of ECTS	4		
8.	Professor ((s)	Nadica Negriev	ska				
9.	Requirements the course	ents for enrolling	None					
10.	At the end - un sat - int de - int pre - ide his of - rec eve - spe she - ide columnation	tisfaction of needs of roduce him/herself tails such as where eract in a simple wa epared to help; entify himself and an place of residence this type to somebo cognize names, the eryday life: signs, h ot and understand of ort text; entify globally (in the mmon texts of the of	tudent is expected amiliar everyday of of a concrete type and others and ca they live, people ay provided the of his date of birth ody; most common w andwritten indica quantified data, p eir aspect, their ty daily environment	expre ex; an a: they ther p conco , his ords tions rope or th	essions and very basic phrasic k and answer questions al know and things they have berson talks slowly and cle erning, for example, his nat school and possibly, to ask or expressions in simple si doubled by icons, prices, s nouns and other very sim aphy, their localization) the school environment; e activities of the daily life c	bout personal e; arly and is tionality, his age, thimself questions ituations of the schedules; ple information in a e function of certain		

11.	 Contents of the course (per 15 weeks per semester): <i>Vocabulary:</i> Basic vocabulary including: numbers, colours, classroom objects, family-related words, appearance, character adjectives, everyday activities, jobs, rooms, things in the house, buildings, foods, containers, months, parts of the body. <i>Basic grammar structures</i>: correct pronunciation of Italian, verbs <i>essere/avere</i>, articles, question words, pronouns, adjectives, present simple, prepositions of time, adverbs of frequency, plurals, prepositions of place. All communicative skills are equally included in the course including basic communication: communicate, in a very simple way; talking about counties and nationalities, greetings and introductions, describing physical appearances and character, talking about abilities, asking for and offering help, talking about daily routines, preferences, telling time, talking about houses and locations, etc. The students will acquire basic knowledge of Italian culture. 									
12.	Methods of learning: Interactive method: group work, reports, homework, seminar papers, discussion, debate,									
13.	Total amo	unt of availa	able time:	120						
14.	Distributio	n of availab	le time: 2-	+1+1						
15.	Forms of t	eaching /	15.1		Lectures / theoretical, contact teaching, e-learning			30 hours		
13.	learning a	ctivities	15.2		Exercises (practical, laboratory, theoretical, seminars, team work)			15. hours		
			16.1	Projects	Projects					
16.	Other forn activities	ns of	16.2	Individual v	Individual work					
	dolivilieo		16.3	Home lear	ning	30. hours				
	Method of assessme									
17.	17.1	Tests / Or	al Exam		70 scores					
	17.2	Individual projects, p		sentation,	10 scores					
	17.3	Activity an	d participa	ation	20. scores					
					up to 50 points	5	(five)	(F)		
					51 to 60 points	6	(six)	(E)		
18.	Assessme	ent Criteria (scores/ n	ointe)	61 to 70 points	7	(seven)	(D)		
10.	ASSESSINE	ent Onteria (scores/ po	Jints)	71 to 80 points	8	(eight)	(C)		
					81 to 90 points	9	(nine)	(B)		
					91 to 100 points	10	(ten)	(A)		
19.	-	approval ar / or transitio			60% active participation at the course					
20.	Language	of teaching	/ study		English and Italian					

21.	Methods of mea quality of teachi	-	monitoring the	Standardized motor tests, observation, survey Self-evaluation				
	Literature							
		Basic literature						
		No	Author	nor Title Publisher		Year		
22. 2	22.1	1.	Marin,T. & Magnelli,S.	Progetto italiano 1, nuovo (Libro dello studente)	Edilingua	2006		
		2.	Marin,T. & Magnelli,S.	Progetto italiano 1, nuovo (Quaderno degli esercizi)	Edilingua	2006		
		3.						
	22.2	Additi	onal literature					
		No	Author	Title	Publisher	Year		
	1.		Marin,T.	La prova orale 1 (Manuale di conversazione, livello elementare - intermedio)	Edilingua	2000		
			L. Toffolo & N. Nuti,	Allegro 1, Corso di italiano per stranieri, Livello elementare	Edilingua	2003		
		3.	Cozzi, N., Federico F. & Tancorre, A.	Caffè Italia, Corso di italiano 1	ELI s.r.l.	2005		

Appen	ıdix 3.	Program of the Co	ourse for First cyc	le stu	udies			
1.	Title of Cou	ırse	Spanish language level A1.1					
2.	Code		4FF100121					
3.	Study program		Computer Engi	Computer Engineering and Technologies				
4.	Organizer of the Study program			Goce Delchev University – Stip Faculty of computer science				
5.	Level (first, second or third cycle of studies)		First cycle					
6.	Academic y	year/ semester	First year / First semester	7.	Number of ECTS	4		
8.	Professor ((s)	Marija Todorova	3				
9.	Requireme the course	ents for enrolling	None					
10.	Aims of the course (competences): At the end of the course the student is expected to: - understand and use familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concrete type;					ases aimed at the		

			nd others and can ask and answer question, people they know and things they have;						
	 interact in a since to help; 	 interact in a simple way provided the other person talks slowly and clearly and is prepared to help; 							
	place of resid	 identify himself and answer questions concerning, for example, his nationality, his age, his place of residence, his date of birth, his school and possibly, to ask himself questions of this type to somebody; 							
	•	-	nost common words or expressions in sim adwritten indications doubled by icons, pri	•					
	 spot and under short text; 	erstand qu	antified data, proper nouns and other ver	y simple information in a					
		•	aspect, their typography, their localizatio ily environment or the school environmen	,					
	 write a very si personal deta 	•	sage concerning the activities of the daily	life containing some					
	Contents of the course	e (ner 15 v	veeks her semester):						
11.	 Contents of the course (per 15 weeks per semester): <i>Vocabulary:</i> Basic vocabulary including: numbers, colours, classroom objects, family-related words, appearance, character adjectives, everyday activities, jobs, rooms, things in the house, buildings, foods, containers, months, parts of the body. <i>Basic grammar structures</i>: correct pronunciation of Spanish, verbs <i>ser/estar</i>, articles, gender and number, question words, pronouns, adjectives, present simple, prepositions, adverbs of frequency, prepositions of place. All communicative skills are equally included in the course including basic communication: communicate, in a very simple way; talking about countries and nationalities, greetings and introductions, describing physical appearances and character, talking about abilities, asking for and offering help, talking about daily routines, preferences, telling time, talking about houses and locations, etc. The students will acquire basic knowledge of Spanish culture. 								
12.	•	echniques	reports, homework, seminar papers, disc s, individual tasks, simulation of extra-curi						
13.	Total amount of availa	ble time: '	120						
14.	Distribution of availab	e time: 2+	1+1						
15.	Forms of teaching /	15.1	Lectures / theoretical, contact teaching, e-learning	30 hours					
10.	learning activities	15.2	Exercises (practical, laboratory, theoretical, seminars, team work)	15. hours					
		16.1	Projects	15 hours					
16.	Other forms of	16.2	Individual work	30 hours					
	activities	16.3	Home learning	30. hours					

	Method of assessme								
17.	17.1	Tests / Oral I	Exam	70 scores					
	17.2	Individual wo projects, prae	ork (presentation, ctical)	10 scores					
	17.3	Activity and p	participation	20. scores					
		I		up to 50 points	5 (five)	(F)			
				51 to 60 points	6 (six)	(E)			
40				61 to 70 points	7 (seven)	(D)			
18.	Assessme	ent Criteria (sco	ores/ points)	71 to 80 points	8 (eight)	(C)			
				81 to 90 points	9 (nine)	(B)			
				91 to 100 points	10 (ten)	(A)			
19.	-	approval and ransition in the	entrance to the final e next year	60% active participation	on at the course	·			
20.	Language	of teaching / s	study	English and Spanish					
21.	Methods of teaching	of measuring /	monitoring the quality of	Standardized motor te Self-evaluation	ests, observation	survey			
	Literature								
		Basic	literature						
	22.1	No	Author	Title	Publisher	Year			
22.		1.	Dr. Marianne Barceló,Juana Sánchez Benito, Verónica Beucker, P.M. Luengo,Bibiana Wiener	¡Vamos! - 1	Mundo Español ediciones	2007			
		2.	A. Jarvis, R. Lebredo, F. Mena-Ayllón	"Basic Spanish Grammar"	Houghton Mifflin Company - USA	2000			
		3.							
	22.2		onal literature	[
ļ		No	Author	Title "Gramatica de	Publisher Mannun	Year			
		1.	A. Gonzales Hermoso, J. R. Cuenot, M. Sanchez Alfaro	español lengua extranjera"	Мадрид, Шпанија	1999			
		2.	Cristina Karpacheva	"Manual de español"	Софија	1998			
		3.	Ramon Sarmiento	"Gramatica progresiva de español para extranjeros"	"Colibri", Софија	1998			

Apper	ndix 3.	Program	of the Co	ourse for First cycle studies					
1.	Title of Cou	urse		Russian Langu	age l	₋evel A1.1			
2.	Code			4FF100321					
3.	Study prog	ram		Computer Eng	ineer	ing and Technologie	S		
4.	Organizer o program	of the Stud	У	Goce Delchev		• •			
5.			third	First cycle	· ·				
6.	Academic year/ semester		ester	First year / First semester	7.	Number of ECTS		4	
8.	Professor ((s)		Igor Stanojoski					
9.	Requireme the course	nts for enr	olling	None					
10.	of the basic of Russian monologue developed	oal of the c level of R words - fro and dialog reading ar	course is tussian la om 500 to gue, devo nd writing	to train students anguage proficie 5 800 words, dev eloped habits for habits.	ncy, velop usin	ractical Russian lang hrough which they w ed habits for perceiv g colloquial spoken l	vill acq ing spe	uire a vocabulary eech in the form of	
11.	developed reading and writing habits. Contents of the course (per 15 weeks per semester): During the course, the main emphasis shall be placed on mastering the Russian alphabet and grammatical categories in the Russian language: Nouns, Genus and Number in Nouns, Personal pronouns, Determinative pronouns, Nominative case, Verbs, Present tense, Accusative case, Adjectives. The training shall be based upon non-specialized (essential) themes of a cultural character: Greetings, Introduction, Asking questions like "Who is this?" And "What is this?", Family, Expressing gratitude, "My, mine", Asking questions like "Who are you?", Pets, Using "How much?", Asking questions "How old are you?", Occupation / Work, Country and Language, Wh-questions.								
12.		method: gi e studying	techniqu	•		, seminar papers, dis imulation of extra-cu			
13.	Total amou	int of availa	able time	: 120					
14.	Distribution	of availab	ole time: 2	2+1+1					
15.	Forms of te	-	15.1	Lectures / the teaching, e-le	arnir	ig	30 ho		
	learning ac	tivities	15.2	Exercises (pr theoretical, se		al, laboratory, ars, team work)	1	5. hours	
			16.1	Projects			15 hc	ours	
16.	Other form activities	s of	16.2	Individual wo	rk		30 hc	ours	
			16.3	Home learnin	g		3	30. hours	

	Method o								
17.	17.1	Tests / Oral	Exam	70 scores					
	17.2	Individual wo projects, pra	ork (presentation, ctical)	10 scores					
	17.3	Activity and	participation	20. scores					
		•		up to 50 points	5 (five)	(F)			
				51 to 60 points	6 (six)	(E)			
18.	Assessm	ent Criteria (so	cores/points)	61 to 70 points	7 (seven)	(D)			
				71 to 80 points	8 (eight)	(C)			
				81 to 90 points	9 (nine)	(B)			
				91 to 100 points	10 (ten)	(A)			
19.		e approval and transition in th	entrance to the final e next year	60% active participati	on at the course	9			
20.	Language	e of teaching /	study	English and Russian					
21.	Methods of teachir	•	monitoring the quality	Standardized motor to Self-evaluation	ests, observatio	n, survey			
	Literature)							
		Basic	Basic literature						
		No	Author	Title	Publisher	Year			
22.	22.1	1.	Ирина Осипова	«Ключ» - Учебник русского языка для начинающих.	Corvina, Москва	2005			
		2.							
		3.							
	22.2	Additio	onal literature						
		No	Author	Title	Publisher	Year			
		1.	S. A. Khavronina, A. I. Shirochenskaya	Русский язык в упражнениях. (Russian in exercises)	Русский язык. Курсы 2017 г.	2017			
		2.	Л. В. Московкин, Л. В. Сильвина	Русский язык. Учебник для иностранных студентов подготовительных факультетов	СМИО Пресс, Санкт- Петербург	2006			
		0.							

Apper			ourse for First cycle studies					
1.	Title of Cou	urse	Macedonian lar	ngua	ge 1			
2.	Code		4FF100721					
3.	Study prog	Iram	Computer Eng	Computer Engineering and Technologies				
4.	Organizer o program	of the Study		Goce Delchev University – Stip Faculty of computer science				
5.	Level (first, cycle of stu	, second or third Jdies)	First cycle	First cycle				
6.	Academic	year/ semester	First year / First semester	7.	Number of ECTS	4		
8.	Professor ((s)	Ana Vitanova-R	linga	ceva			
9.	Requireme the course	ents for enrolling	None					
10.	the course None Aims of the course (competences): At the end of the course the student is expected to: - understand and use familiar everyday expressions and very basic phrases aimed at satisfaction of needs of a concrete type; - introduce him/herself and others and can ask and answer questions about personal details such as where they live, people they know and things they have; - interact in a simple way provided the other person talks slowly and clearly and is prepared to help; - identify himself and answer questions concerning, for example, his nationality, his a his place of residence, his date of birth, his school and possibly, to ask himself questions							
11.	 Contents of the course (per 15 weeks per semester): Vocabulary: Basic vocabulary including: Alphabet, international words, names, greetings, countries and cities, objects, professions, countries and languages, family, food and drinks, meals, days, months, clothes, colors, parts of the head and the body, free time, abilities; <i>Grammar:</i> Basic grammar: personal pronouns and the auxiliary verb "cym" – "to be" (affirmative, negative and interrogative form), present tense (a-, e- and i-verb groups), nouns (gender, number and determination), adjectives and possessive pronouns-adjectives. All communicative skills are equally included in the course including basic communication: spelling names, exchanging phones, talking about counties and nationalities, greetings and introductions, describing physical appearances and character, talking about abilities, talking 							

		•	-	-	buses and locations, its will acquire basic	-		donian
12.	Interactive cooperati	-	technique	•	ork, seminar papers, s, simulation of extra			
13.	Total amo	ount of avail	able time:	120				
14.	Distributio	on of availat	ole time: 2-	+1+1				
15.	4	teaching /	15.1	Lectures / theorem teaching, e-lear	rning	30 hour	S	
10.	learning a	activities	15.2		ctical, laboratory, ninars, team work)	15.	ours	
			16.1	Projects		15 hour	S	
16.	Other forr activities	ns of	16.2	Individual work		30 hour	S	
	uouvilioo		16.3	Home learning		30.	ours	
	Method o			I				
17.	17.1	Tests / Or	al Exam		70 scores			
	17.2	Individual projects, p		sentation,	10 scores			
	17.3	Activity an	nd participa	ation	20 scores			
					up to 50 points	5	(five)	(F)
					51 to 60 points	6	(six)	(E)
10	A	ant Oritaria	(-:	61 to 70 points	7	(seven)	(D)
18.	Assessme	ent Criteria	(scores/ po	DINTS)	71 to 80 points	8	(eight)	(C)
					81 to 90 points	9	(nine)	(B)
					91 to 100 points	10	(ten)	(A)
19.	-	approval a transition in		e to the final ear	60% active participation at the course			
20.	Language	e of teaching	g / study		English			
21.	Methods of teaching		g / monito	ring the quality	Standardized moto Self-evaluation	or tests, o	bservation	, survey
	Literature							
		Bas	ic literatur	е				
		No	Autho	r	Title	Publish	er	Year
22.	22.1	1.		ја Кусевска, на Митковска	Зборувате ли македонски? (учебник)	МЕДИС информ		1995/ 2016
	2.		Татја	и Бужаровска, на Гочкова- новска	Зборувате ли македонски?	МЕДИС информ		1995

			(работна тетратка)				
	3.	Татјана Гочкова- Стојановска, Искра Пановска Димкова	Божилак	Универзитет "Св. Кирил и Методиј"	2012		
22.2	Additio	nal literature					
	No	Author	Title	Publisher	Year		
	1.						
	2.						
	3.						

Append	dix 3.	Program of the Co	urse for First cycl	e stu	dies		
7.	Title of Co	ourse	Mathematics 2	Mathematics 2			
8.	Code		2FI101121				
9.	Study prog	gram	Computer Engin	eerir	ng and Technologies		
10.	Organizer of the Study program		Goce Delchev U Faculty of comp				
11.	Level (firs cycle of st	t, second or third udies)	First cycle				
12.		year/ semester	First year/ second semester	7.	Number of ECTS	6	
23.	Professor	(s)	Prof. Tatjana Ata	anas	ova Pachemska, full profess	or	
24.	Requirements the course	ents for enrolling		Enrolment in the first cycle of studies of the study program and taken course in Mathematics 1			
25.	To adopt a of general adopt the l the conce Developm of learning The stude	lization of the notion basic concepts of di- pt of analogy and ent of analytical opi g is also expected. ent should know and	al calculus for a fund of an infinite nur fferential and integ generalization, to nion, critical abilit d understand bas	neric gral c lea ies, a ic ma	on of one variable, to underst cal sequence, functional seq calculus of functions of severa- irn to solve first-order ordir ability to generalize and ana athematical concepts and th flexible use of knowledge in	uence and applications, to al variables, to understand hary differential equations. logies as the highest level neories, should use ICT to	
26.	 Definite Relation integral ca Indefinite techniques Integrat Applica rotational 3 	nship between a de alculus. Introduction te integral – concep s; ing some types of fu tion of a definite in	according to Rie efinite integral an of the notion of p t, properties, rela unctions – rationa tegral – length of obtained by rotati	d a rimiti tions I, irra	n, properties of a definite inte derivative - fundamental (No ve function; hip between indefinite and c ational, trigonometric, transce arc of a curve, area of a fig round the coordinate axes	ewton-Leibniz) theorem of definite integral, integration endental functions	

7. Numerical sequence - generalization of the term sequence and definition of sequence, convergence of sequence, properties, general criteria for convergence; 8. Number series - types of series and criteria for convergence - series with positive members, alternative series, absolute and conditional convergence; 9. Functional sequences and functional series - definition, pointwise convergence and uniform convergence, differentiation and integration of a functional series. Degree order and admissions; 10. Functions of multiple variables – definition, properties, graph of a function of two variables, continuity and types of breakpoints: 11. Functions with two variables - concept of differentiability, partial derivatives, extrema and application: 12. Multiple integrals - generalization of the notion of integral, change of variables in integral; 13. Multiple integrals - application 14. Differential equations of the first order - concept, general and particular solution of a differential equation, Cauchy's problem: 15. Solving some basic types of differential equations Methods of learning: Lectures, exercises, preparation of a seminar paper and presentations, teaching with 27. using ICT 28. Total amount of available time: 6 ECTS x 30 hours = 180 hours 29. Distribution of available time: 30+30+15+60+45 = 240 hours (2+2+2) Lectures / theoretical, contact teaching, 15.1 30 Forms of teaching / e-learning 30. learning activities (practical, Exercises laboratory. 30 15.2 theoretical, seminars, teamwork) 16.1 Projects 15 Other forms of 16.2 31. Individual work 60 activities 16.3 45 Home learning Method of assessment Tests / Oral Exam 17.1 70 scores 32. Individual work (presentation. 17.2 10 scores projects, practical) 17.3 Activity and participation 20 scores 5 up to 50 points (five) (F) 6 51 to 60 points (six) (E) 7 61 to 70 points (seven) (D) 33. Assessment Criteria (scores/ points) 71 to 80 points 8 (C) (eight) 81 to 90 points 9 (nine) (B) 91 to 100 points 10 (ten) (A) Apart from 42 points from partial exams, completed Signature approval and entrance to the final 34. homework and regularity of lectures, classroom exam/ or transition in the next year exercises and laboratory exercises 35. Language of teaching / study English Methods of measuring / monitoring the quality of 36. Self-evaluation, periodic tests, debates teaching Literature 37. **Basic literature** 22.1 No Author Title Publisher Year

	1.	Т. А. Пачемска, Л. Лазарова	Математика (the book will be translated in English)	Универзитет "Гоце Делчев" - Штип	2013
	2.	Т.А.Пачемска	Математика 2	Book in progress, will be translate in English	2023
	3.	Т. А. Пачемска, Л. Лазарова, М. Митева	Збирка задачи по Математика 2	GDU (Will be translate in English)	2022
22.2	Additio	nal literature	-		
	No	Author	Title	Publisher	Year
	1.				

Annex	(3.	Program	of the co	ourse for First c	/cle	studies			
1.	Title of Cou	irse		Discrete mathematics					
2.	Code			2FI101421					
3.	Study prog	ram		Computer Engir	eerir	ng and Technologies			
4.	Organizer of the Study program			Goce Delchev L Faculty of Comp					
5.	Level (first, cycle of stu		third	First cycle					
6.	Academic year/ semester			First year / Second semester	7.	Number of ECTS		6	
7.	Professor (s)			prof. Limonka K	ocev	a Lazarova			
8.	Requireme the course	nts for enro	lling	None					
9.	Aims of the course (competences): In this course, basic mathematical concepts for computer engineering will be studied. Students will get knowledge from the basics of set theory, relations, mappings, propositional logic and its application in logic circuits, predicate logic, proof techniques, counting principles and graph theory.								
10.	constructio conclusions concepts of	n of logic s. Theory f graph theo	circuits. I of sets. I ory. Graph	Minimization. Pro Relations. Mapp representation,	edica ngs. matri	ions. Application of te logic and quantifi Principles of counti x of adjacency, adjac Recurrent equations.	iers. D ng. Co ency lis	erivation of logical mbinatorics. Basic st, incidence matrix.	
11.	Methods of consultation		ectures, t	heoretical and p	actic	al exercises, e-learnir	ng, tear	mwork,	
12.	Total amou	nt of availa	ble time:	6 ECTS x 30 hou	rs =	180 hours			
13.	Distribution	of availabl	e time: 30) + 30 + 30 + 30 +	+ 60	= 180 hours (2 + 2 +1)		
14.	Forms of te learning ac		15.1	Lectures / the teaching, e-tea (15 weeks x 2	achin		30 ho	urs	

				15.2	exams, p seminar	cal and practical exercises, e- preparation of independent work ks x 1 hours = 15 hours)	30 ho	ours			
				16.1	Projects		30 ho	ours			
15.	Other fo			16.2	Individua	al work	30 ho	ours			
	aotivitio	0		16.3	Home learning			ours			
16.	Method assessr	-				-					
	17.1	Те	sts / Ora	al Exam		70 scores					
17.	17.2 Individual work (presentation, practical)				entation,	10 scores					
	17.3	Ac	tivity and	d participat	tion	20 scores					
						up to 50 points	5	(five)	(F)		
						51 to 60 points	6	(six)	(E)		
40			uiteuie (e		- 1 -)	61 to 70 points	7	(seven)	(D)		
18.	Assessment Criteria (scores/ points)					71 to 80 points	8	(eight)	(C)		
						81 to 90 points	9	(nine)	(B)		
						91 to 100 points	10	(ten)	(A)		
19.				d entrance n in the ne		60% active participation at the	course	9			
20.	Langua	ge of te	eaching	/ study		English					
21.	Method: quality of			/ monitorir	ng the	Standardized motor tests, observation, survey Self-evaluation					
	Literatu	re									
		Basic	literatur	e							
		No	Autho	or		Title	Publis	sher	Year		
22.	22.1	1.	Kenne	eth H. Ros	en	Discrete Mathematics and Its Applications Seventh Edition	Mc G	raw Hill	2007		
	2. Susanna S. Epp		nna S. Epp)	Discrete Mathematics Brooks/Cole with Applications Fourth Edition		s/Cole	2010			
	22.2	Additi	onal lite	rature							
		No	Autho	r		Title	Publis	sher	Year		

Annex 3.	
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Program of the Course for Integrated Second cycle studies

1.	Title of Co	ourse		Object Oriented	1 Programming					
2.	Code			2FI101221						
3.	Study pro	gram		Computer Engine	ering and Technol	logies				
4.	Organizer program	r of the Stu	dy	Goce Delchev Un Computer Scienc						
5.		t, second c	or third	First cycle						
6.		; year/ sem	ester	First year / II semester	7. Number of E	СТЅ	6			
7.	Professor	. (s)		Full Professor Cv	Full Professor Cveta Martinovska Bande					
8.	Requirements for enrolling the course			None						
9.	This cours	ne course (se teaches)++ prograr	the fund	amental concepts	behind the object-	oriented appro	oach to progra	amming		
10	Contents Basic objection code. Fu classes, p functions	of the cour ect-oriented ndamental polymorphis and opera	se (per 1 d concep object-c sm and vi itors. Co	5 weeks per seme ts: attributes, meth priented ideas: inl irtual functions. Poi nstant and static ype identification. I	ods, class and su neritance hierarch nters to members, nembers and fun	ies, overridin functions and ctions. Templ	ng methods, I classes. Ove lates, exceptio	abstract rloading		
11	Methods	of learning:	Lecture	s, Discussions, Lat				and		
12	team projects, office hours. Total amount of available time: 6 ECTS x 30 hours a = 180 hours									
13				30 + 30 + 30 + 30		(2+2+1)				
14	Forms of	teaching	15.1	Lectures / theoretical, contact teaching, e-learning			ours			
	/ learning		15.2	Exercises (practical, laboratory, theoretical, seminars, team work)			30 hours			
			16.1	Projects		30 ho	30 hours			
15	Other forr activities	ms of	16.2	Individual work		30 ho	ours			
			16.3	Home learning		60 ho	60 hours			
16	Method of assessme									
	17.1	Tests / Or	ral Exam		70 scores					
17	17.2	Individual projects, j		resentation,	10 scores					
	17.3	Activity ar	nd partici	pation	20 scores					
					up to 50 points	5	(five)	(F)		
					51 to 60 points	6	(six)	(E)		
18	Assessme	ent Criteria	(scores/	points)	61 to 70 points	7	(seven)	(D)		
					71 to 80 points	8	(eight)	(C)		
					81 to 90 points	9	(nine)	(B)		

1					T		
				91 to 100 points	10 (ten)	(A)	
	exam/ or transi		d entrance to the final ne next year	60% active participation at the course			
20	Language of teaching / study			English			
21	Methods of me of teaching	asuring	/ monitoring the quality	Standardized motor te Self-evaluation	sts, observation,	survey	
	Literature						
		Basic	literature				
22	22.1	No	Author	Title	Publisher	Year	
22		1.	Bruce Eckel	Thinking in C++	Prentice Hall	2000	
		2.	Stanley Lippman	Essential C++	Addison Wesley	1999	
		3.	Herbert Schildt	C++: The Complete Reference	McGraw Hill	2002	
	22.2	Additi	onal literature				
		No	Author	Title	Publisher	Year	
		1.	Stanley Lippman	C++ Primer	Addison Wesley	2005	
		2. Nicolai Josuttis		The C++ Standard Addison Library: A Tutorial Wesley and Reference		1999	
	3		Ulla Kirch-Prinz and Peter Prinz	A Complete Guide to Programming in C++	Jones and Bartlett Publishers	2002	

Append	dix 3.	Program of the C	ourse for First cy	cle s	tudies		
1.	Title of Course		Computer Electronic Components				
2.	Code		2FI101321				
3.	Study pro	ogram	Computer Engi	neer	ing and Technologies		
4.	Organizer of the Study program		Goce Delchev I Faculty of comp				
5.	Level (firs	st, second or third tudies)	First cycle				
6.	Academic	c year/ semester	First / 2	7.	Number of ECTS	6	
8.	Professor	-	Prof. Done Stojanov				
9.	Requirem the cours	ents for enrolling	/				
10.	Aims of the course (competences): The course aims to provide comprehensive knowledge and understanding of the most important aspects of microelectronic circuits design. Upon successful completion of the course, students will be able to design/implement analog and digital circuits for basic and advanced data computing.						
11.	Contents of the course (per 15 weeks per semester):						

	- '	Voltage and	Current]					
	-	- Resistor in I	DC circuit								
				generator (DC and	d AC)						
		Ohm's law									
			rchhoff first and second law								
				nd serial connect	ion						
				tion of multiple ca							
		Thevenin's			2P 4011010						
				er and high-freque	ency filters						
		Semiconduc		- ·							
		Ideal model		Juniouony							
		Circuits with									
				R and Not circuit	with diodes						
		- Implementing AND, OR and Not circuit with diodes									
		 NPN and PNP junction The model of BJT transistor 									
				nd output charact	oristics						
			-	-	iration mode, active mo	ode					
		BJT transist	_			Jue					
		Circuits with	Ū	arampimer							
	-	Implementir	ig AND, O	ir, no i, nand a	and NOR circuits with E	50 1					
12.				•	atory, home learning						
13.				e: 6 ECTS x 30 h =							
14.	Distribut	ion of availa	ble time:	30+30+30+30+60	. ,						
15.		f teaching	15.1	teaching, e-learr	ě – – – – – – – – – – – – – – – – – – –	30					
10.	/ learning	g activities	15.2		actical, laboratory, inars, teamwork)	30					
			16.1	Projects		30					
16.	Other activities	forms of	16.2	Individual work		30					
			16.3	Home learning		60					
	Method assessm	of nent									
17.	17.1	Tests / Ora	al Exam		70 scores						
	17.2	Individual projects, p	work ractical)	(presentation,	10 scores						

	17.3	Activity and	participation	20 cores				
				up to 50 points	5 (five)	(F)		
				51 to 60 points	6 (six)	(E)		
18.	A	aant Critaria (accreation (painta)	61 to 70 points	7 (seven)	(D)		
10.	Assessi	ient Chtena (scores/ points)	71 to 80 points	8 (eight)	(C)		
				81 to 90 points	9 (nine)	(B)		
				91 to 100 points	10 (ten)	(A)		
19.		e approval an r transition in t	nd entrance to the final the next year	/				
20.	Languag	e of teaching	/ study	English				
21.	Methods of teach		g / monitoring the quality	Self-evaluation				
	Literatur	e						
		Basic	literature					
		No	Author	Title	Publisher	Year		
22.	22.1	22.1	1.	Sedra, A.S., Smith, K.C., Carusone, T.C. and Gaudet, V.	Microelectronic circuits (Vol. 4).	New York: Oxford university press.	2004	
		2.						
		3.						
	22.2	Additi	onal literature					
		No	Author	Title	Publisher	Year		
		1.						

Apper	ndix 3.	Program of the Co	ourse for First cyc	le stu	udies			
1.	Title of Cou	urse	English languag	je lev	vel A2.2			
2.	Code		4FF101123					
3.	3. Study program		Computer Engi	Computer Engineering and Technologies				
4.	Organizer of the Study program		Goce Delchev University – Stip Faculty of computer science					
5.	Level (first, cycle of stu	, second or third udies)	First cycle					
6.	Academic year/ semester		First year / second semester	7.	Number of ECTS	4		
8.	Professor (Dragan Donev						

9.	Requirements for enro	olling	None					
10.	 At the end of the course the student is expected to: understand phrases and the highest frequency vocabulary related to areas of most immediate personal relevance (e.g. very basic personal and family information, shopping, local area, employment). catch the main point in short, clear, simple messages and announcements. read very short, simple texts and find specific, predictable information in simple everyday material such as advertisements, prospectuses, menus and timetables and understand short simple personal letters. communicate in simple and routine tasks requiring a simple and direct exchange of information on familiar topics and activities and handle very short social exchanges. use a series of phrases and sentences to describe in simple terms family and other people, living conditions, educational background and present or most recent job. write short, simple notes and messages, write a very simple personal letter, for example thanking someone for something. Contents of the course (per 15 weeks per semester): 							
11.	Contents of the course (per 15 weeks per semester): <i>Vocabulary:</i> types of disasters, parts of the body, types of accidents; illnesses and cures, medical professions and workplaces, emergency services; dishes, places to eat, ways to cook, types of shops, products, clothes, shopping habits and money; hobbies and personalities, sports and equipment, places for sports, films, types of entertainment; inventions, computers, space, solar system, UFOs, supernatural and environmental issues. <i>Grammar:</i> present perfect vs past simple; comparatives/superlatives; the definite article "the", plurals: past continuous vs past simple: reflexive propouns: conditionals type 0.8.1:							
12.	-	echniques	reports, homework, seminar papers, disc s, individual tasks, simulation of extra-curr					
13.	Total amount of availa	ble time:	120					
14.	Distribution of availab	le time: 2+	-1+1					
15.	Forms of teaching / learning activities	15.1 15.2	Lectures / theoretical, contact teaching, e-learning Exercises (practical, laboratory, theoretical, seminars, teamwork)	30 hours 15. hours				
	Other forms of	16.1	Projects	15 hours				
16.	activities	16.2	Individual work	30 hours				

			16.3	Home learning		30 hours		
	Method of assessme			1		•		
	17.1	Tests / Ora	al Exam		70 scores			
17.	17.2	Individual v projects, p		sentation,	10 scores			
	17.3	Activity and	d participa	ation	20 scores			
					up to 50 points	5 (five)	(F)	
					51 to 60 points	6 (six)	(E)	
18.	Assessme	ent Criteria (s	ooroo/ po	vinto)	61 to 70 points	7 (seven)	(D)	
10.	Assessme	an Chiena (s	scores/ pu	mits)	71 to 80 points	8 (eight)	(C)	
					81 to 90 points	9 (nine)	(B)	
					91 to 100 points	10 (ten)	(A)	
19.	•	approval an ransition in t		e to the final ear	60% active participation at the course			
20.	Language	of teaching	/ study		English			
21.	Methods of teaching	of measuring	/ monitor	ing the quality of	Standardized motor te Self-evaluation	ests, observation	, survey	
	Literature							
		Basi	c literatur	е				
		No	Autho	r	Title	Publisher	Year	
22.	22.1	1.	JENN	INIA EVANS - Y DOOLEY	Upstream Elementary A2	Express Publishing	2006	
		2.		Oxenden and ina Latham- g	New English File Beginner	Oxford University Press	2011	
		3.						
	22.2	Addi	tional liter	rature				
		No	Autho	r	Title	Publisher	Year	
		1.	Zoze	Murgoski	English Grammar: With Contrastive Notes on Macedonian	National and University Library Kliment Ohridski	1997	
		2.						
		3.						

Appendix 3. Program of the Con			urse for First cycle studies
1.	1. Title of Course		Italian language level A1.2
2.	Code		4FF100923

3.	Study program	Computer Engineering and Technologies						
4.	Organizer of the Study	Goce Delchev L		• •				
5.	program Level (first, second or third cycle of studies)	Faculty of comp First cycle	uter	Science				
6.	Academic year/ semester	First year / second 7. Number of ECTS 4 semester 4						
8.	Professor (s)	Nadica Negrievs	ska					
9.	Requirements for enrolling the course	None						
10.	 Aims of the course (competences): can interact in a simple way, ask and answer simple questions about themselves, where they live, people they know, and things they have, initiate and respond to simple statements in areas of immediate need or on very familiar topics, rather than relying purely on a very finite rehearsed, lexically organised repertoire of situation-specific phrases. can use simple phrases and sentences to describe or to ask for some things; can write a postcard or brief messages and read very short and simple texts. 							
11.	contents of the course (per 15 vocabulary: holidays and vaca meals, food and beverages, typ routines, accessories; modes o grammar structures: demonstra ending in -ista; the polite form; prepositions <i>in</i> , <i>da</i> , <i>a</i> , <i>al</i> ; adver articulated prepositions; locativ members; prepositions of locati prossimo); past participles of re perfect: essere or avere?; expre present perfect. all communicative skills are equinvitations, accept or decline ar activities; express uncertainty a express the date; talk about ho greetings; ask about and descr addresses; talk about family; ta restaurant; talk about clothing s transportation in cities; express occurred; describe the location disagreement, and disagree wit Methods of learning:	tions, weather; na bes of restaurants of transportation, s ative pronouns <i>qu</i> the present indica bs and expression e <i>ci;</i> possessive a ion; reflexive verb egular verbs; expre essions of place; i ually included in the n invitation, talk ab and doubt; talk ab lidays; organize a ibe the weather; o ilk about dishes and styles; describe ar s surprise; talk about of places in a city	imes , sett hops <i>esto</i> ntive hs of adjec s wit essic irreg he cc out p trip; descr nd m n arti- put p	ing the table; articles of cl s, places in a city; sporting and <i>quello</i> ; possessive ac of <i>andare, venire, fare, sa</i> frequency; numbers from tives, possessive adjective h modal verbs; present pe ons of time; auxiliary verbs ular past participles; adver purse including basic comr leisure activities, talk abour rofessions; ask for and tel talk about prices; exchang- ibe personality; ask for an eals; express preferences cle of clothing; talk about r ast events; describe when	othing, shoes, daily activities. ljectives; nouns <i>pere;</i> the 101 to 10000; es with family erfect (passato in the present bs of time with the munication: extend it the frequency of I time; ask for and ge holiday d provide s; order at a modes of a past event			
12.	Interactive method: group work, reports, homework, seminar papers, discussion, debate, cooperative studying techniques, individual tasks, simulation of extra-curricular educational activities, individual studying.							
13.	Total amount of available time:	120						
14.	Distribution of available time: 2	+1+1						

15.	Forms of te	eaching /	15.1	Lectures / t teaching, e	heoretical, contact -learning	30 hours		
15.	learning ad	ctivities	15.2		practical, laboratory, seminars, team work)	15 hours		
			16.1	Projects		15 hours		
16.	Other form activities	is of	16.2	Individual v	vork	30 hours		
	activities		16.3	Home learr	ning	30 hours	6	
	Method of assessme	nt						
17.	17.1 Tests / Or		al Exam		70 scores			
	17.2	Individual v projects, p		entation,	10 scores			
	17.3	Activity and	d participa	tion	20. scores			
					up to 50 points	5 (five)	(F)	
					51 to 60 points	6 (six)	(E)	
10					61 to 70 points	7 (sever	n) (D)	
18.	Assessme	nt Criteria (s	scores/ poi	ints)	71 to 80 points	8 (eight) (C)	
					81 to 90 points	9 (nine) (B)	
					91 to 100 points	10 (ten)	(A)	
19.	-	approval an ransition in t		e to the final ear	60% active participation at t	the course		
20.	Language	of teaching	/ study		English and Italian			
21.	Methods o quality of t	f measuring eaching	/ monitori	ng the	Standardized motor tests, observation, survey Self-evaluation			
	Literature							
		Bas	ic literature	e				
		No	Autho	r	Title	Publisher	Year	
22.	22.1	1.	Marin Magn	,	Progetto italiano 1, nuovo (Libro dello studente)	Edilingua	2006	
		2.	Marin. Magne		Progetto italiano 1, nuovo (Quaderno degli esercizi)	Edilingua	2006	
		3.						
	22.2	Add	itional liter	ature			-	
		No	Autho	r	Title	Publisher	Year	
		1.	Marin,T.		La prova orale 1 (Manuale di conversazione, livello elementare - intermedio)	Edilingua	2000	
		2.	L. Tof Nuti,	folo & N.	Allegro 1, Corso di italiano per stranieri, Livello elementare	Edilingua	2003	

		3.	Cozzi, N., Federico F. & Tancorre, A.	Caffè Italia, Corso di italiano 1	ELI s.r.l.	2005
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Apper	Appendix 3. Program of the C			ourse for First cycle studies					
	Title of Cou	urse		German langua	ige le	vel A1.2			
	Code			4FF101223					
	Study prog	ram		Computer Eng	ineer	ing and Technologie	es		
	Organizer o program		•	Goce Delchev I Faculty of comp		• •			
	Level (first, cycle of stu		r third	First cycle					
	Academic year/ semester		First year / second semester	7.	Number of ECTS		4		
8.	Professor ((s)		Marica Tasevs	ka				
9.	Requireme the course	ents for enr	olling	None					
10.	Aims of the course (competences): Students to be able to conduct short dialogues when meeting, greeting, to express opinions on everyday topics, to find an unknown city, to communicate with people from German-speaking countries, to shop in Germany, to make recommendations, to describe and express specific opinions, to get acquainted with the culture and civilization in the German-speaking countries, etc. Contents of the course (per 15 weeks per semester):								
11.	Grammar: (müssen, c (Nominativ "Wo?" und Dativ), dati Vocabulary important h Speaking: present and and clothes discussions location, di evaluating	temporal p lürfen, soll und Akku: "Wohin?", ve verbs, o // professio nolidays in naming an d future, e s), giving a s about ho scussing a pieces of o	prepositic en,), Inde sativ), pr (Konjun conjunkti on, health the Gerr d definin stablishir advice, co usehold a timetab	ons (vor,seit, für, efinite pronoun "r eposition mit,, lol on "denn" n, sights of Germ nan-speaking co g occupations, re diagnoses and oncluding deals, rules, finding a h	bei, i man" kal pi rative an-s untrie eport d rece resch otel i otel i	hach, in, bis, ab), pre- with modal verb, Po- reposition (Lokale Pi pronouns, persona peaking cities, fashio sommendations, deso meduling and canceli reception, giving inst expression of liking/o	ossessiv räpositic I pronou on and c s, sharin cribing p ng appo tructions	e articles onen auf die Frage un (Akkusativ / clothing, more g information from people (character pintments, s on a specific	
12.		method: g e studying	techniqu			, seminar papers, di imulation of extra-cu			
13.	Total amou	unt of avail	able time	e: 120					
14.	Distribution	n of availat	ole time:	2+1+1					
15.	Forms of te learning ac		15.1	Lectures / the teaching, e-le	arnin	g	30 ho	urs	
			15.2	Exercises (practical, laboratory, theoretical, seminars, team work)			hours		
16.	Other form	s of	16.1	Projects			15 ho	urs	
10.	activities		16.2	Individual wor	'k		30 ho	urs	

		Г	16.3	Home learning		hours	6			
	Method of				I					
	assessme	Tests / Ora	l Exam		70 scores					
17.	17.2	Individual v projects, pr	vork (pre	sentation,	10 scores					
	17.3	Activity and		ation	scores					
					up to 50 points	5	(five)	(F)		
					51 to 60 points	6	(six)	(E)		
				61 to 70 points	7	(seven)	(D)			
18.	Assessme	ent Criteria (s	cores/ p	oints)	71 to 80 points	8	(eight)	(C)		
					81 to 90 points	9	(nine)	(B)		
					91 to 100 points	10	(ten)	(A)		
19.	Signature approval and entrance to the final exam/ or transition in the next year			60% active participati	on at th	ne course				
20.	Language of teaching / study			English and German						
21.	Methods of measuring / monitoring the quality of teaching			Standardized motor tests, observation, survey Self-evaluation						
	Literature									
		Basio	Basic literature							
		No	Autho	r	Title	Publis	sher	Year		
22.	22.1	1.	Sylvet Hiems Sprec	la Niebisch, tte Penning- stra, Franz ht, Monika mann, Monika ann	Schritte International 2 Kusrbuch + Arbeitsbuch	Hueb	er Verlag	2006		
		2.	Friede Voß	erike Jin, Ute	Grammatik aktiv Üben, Hören, Sprechen	Corne	elsen	2018		
		3.	Ранка Грчева 3. Петер Рау		Голем македонско- германски и германско- македонски речник	Marop 2006				
	22.2	Addit	ional lite	rature						
		No								
	Димитрија Гацов1.2.Pude Angela, Sprecht Franz		трија Гацов	Германска Граматика		"Климент дски" - је	1995			
			Menschen A1.2		er Verlag	2012				
		3.		Swerlowa	Grammatik & Konversation Arbeitsblätter für den Deutschunterricht	Lango	enscheid	2013		

Append	dix 3.	Program of the C	Course for First cy	cle s	studies	
1.	Title of C	ourse	Spanish langua	ige le	evel A1.2	
2.	Code		4FF100823			
3.	Study pro	ogram	Computer Eng	ineer	ing and Technologies	
4.	program	r of the Study	Goce Delchev I Faculty of comp		•	
5.	Level (firs	st, second or third studies)	First cycle			
6.	Academic	c year/ semester	First year / second semester	7.	Number of ECTS	4
8.	Professor	r (s)	Marija Todorova	а		
9.	Requirem the cours	nents for enrolling e	None			
10.	w s p - c	where they live, peo tatements in areas purely on a very finit hrases. an use simple phra	ple they know, ar of immediate nee te rehearsed, lexi uses and sentence	nd thi ed or cally es to	wer simple questions ab ings they have, initiate a on very familiar topics, organised repertoire of describe or to ask for s rery short and simple tex	and respond to simple rather than relying situation-specific ome things;
11.	vocabula and meal shoes, da activities. grammar present in of frequen reflexive simple te all comm extend in frequency time; ask exchange and provi	s, food and bevera aily routines, access structures: adverbs ndicative of irregula ncy; numbers from verbs, present perfors of place; irregul nse, future tense. unicative skills are vitations, accept or y of activities; expre- for and express the e holiday greetings; de addresses; talk	acations, weather ges, types of rest sories; modes of s of time, demons r verbs, the prep 101 to 1 million, p ect, past participles equally included decline an invita ess uncertainty ar e date; talk about ask about and d about family; talk	; nan aura trans strativ possi es of s; ad in the tion, nd do c holic escril abo	r): nes of relatives; dishes, nts, setting the table; ar portation, shops, places ve pronouns, possessive ns <i>en, de, a, con</i> ; adver essive adjectives, prepo regular verbs; expressi verbs of time with the pr e course including basic talk about leisure activit pubt; talk about professio days; organize a trip; tal be the weather; describ ut dishes and meals; ex	ticles of clothing, s in a city; sporting e adjectives; the rbs and expressions ositions of location; ons of time, resent perfect, past communication: ies, talk about the ons; ask for and tell k about prices; e personality; ask for press preferences;

	past ever	modes of transportation in cities; express surprise; talk about past events; describe when a past event occurred; describe the location of places in a city; talk about sports; express agreement, disagreement, and disagree with others.						
12.	Interactiv cooperat	Methods of learning: Interactive method: group work, reports, homework, seminar papers, discussion, debate, cooperative studying techniques, individual tasks, simulation of extra-curricular educational activities, individual studying.						
13.	Total am	ount of ava	ilable time	e: 120				
14.	Distributi	on of availa	able time:	2+1+1				
15.	Forms of	•	15.1	Lectures / theorem teaching, e-lear	ning	30 hours		
101	/ learning	/ learning activities			tical, laboratory, hinars, team work)	15 hours		
	Otherfor	ma af	16.1	Projects		15 hours		
16.	Other for activities	Other forms of activities		Individual work		30 hours		
				Home learning		30 hours		
	Method o assessm			•	_	•		
17.	17.1	Tests / O	ral Exam		70 scores			
17.	17.2	Individual projects,		esentation,	10 scores			
	17.3	Activity a	nd particip	pation	20 scores			
					up to 50 points	5 (five)	(F)	
					51 to 60 points	6 (six)	(E)	
4.0			, ,		61 to 70 points	7 (seven) (D)	
18.	Assessm	ent Criteria	a (scores/	points)	71 to 80 points	8 (eight)	(C)	
					81 to 90 points	9 (nine)	(B)	
					91 to 100 points	10 (ten)	(A)	
19.	•	e approval transition i		nce to the final	60% active participation at the course			
20.	Languag	e of teachir	ng / study		English and Spanish			
21.	Methods of teachir		ng / monit	toring the quality	Standardized motor Self-evaluation	tests, observatio	on, survey	
	Literature	e						
		Bas	sic literatu	re				
		No	Autho	or	Title	Publisher	Year	
22.	22.1	22.1 Dr. Ma Barcel 1. Sánch Veróni		larianne eló,Juana hez Benito, hica Beucker, Luengo,Bibiana er	¡Vamos! - 1	Mundo Español ediciones	2007	

		2.	A. Jarvis, R. Lebredo, F. Mena-Ayllón	"Basic Spanish Grammar"	Houghton Mifflin Company - USA	2000		
		3.						
2	22.2	Additional literature						
		No	Author	Title	Publisher	Year		
		1.	A. Gonzales Hermoso, J. R. Cuenot, M. Sanchez Alfaro	"Gramatica de español lengua extranjera"	Мадрид, Шпанија	1999		
		2.	Cristina Karpacheva	"Manual de español"	Софија	1998		
		3.	Ramon Sarmiento	"Gramatica progresiva de español para extranjeros"	"Colibri", Софија	1998		

Apper	ndix 3.	Program of the Co	ourse for First cy	ourse for First cycle studies				
1.	Title of Cou	urse	French language level A1.2					
2.	Code		4FF101023					
3.	Study prog	ram	Computer Eng	ineei	ing and Technologies			
4.	Organizer program	of the Study	Goce Delchev I Faculty of comp					
5.	Level (first, cycle of stu	, second or third udies)	First cycle					
6.	Academic year/ semester		First year / second semester	7.	Number of ECTS	4		
8.	Professor ((s)	Svetlana Jakimovska					
9.	Requireme the course	ents for enrolling	None					
10.	 Aims of the course (competences): can interact in a simple way, ask and answer simple questions about themselves, we they live, people they know, and things they have, initiate and respond to simple statements in areas of immediate need or on very familiar topics, rather than relying purely on a very finite rehearsed, lexically organised repertoire of situation-specific phrases. can use simple phrases and sentences to describe or to ask for some things; can write a postcard or brief messages and read very short and simple texts. 					l to simple er than relying tion-specific things;		

contents of the course (per 15 weeks per semester): vocabulary: holidays and vacations, weather; names of relatives; dishes, courses of a meal, and meals, food and beverages, types of restaurants, setting the table; articles of clothing, shoes, daily routines, accessories; modes of transportation, shops, places in a city; sporting activities. grammar structures: demonstrative pronouns; possessive adjectives; the present of basic verbs; expressions of frequency; numbers from 101 to 10000 prepositions; possessive adjectives, possessive adjectives with family members: prepositions of location; reflexive verbs with modal verbs; present perfect (passé composé); past participles of regular verbs; expressions of time; auxiliary verbs in the present perfect: être or avoir?; expressions of place; irregular past participles; adverbs of time with the present perfect. 11. all communicative skills are equally included in the course including basic communication: extend invitations, accept or decline an invitation, talk about leisure activities, talk about the frequency of activities; express uncertainty and doubt; talk about professions; ask for and tell time; ask for and express the date; talk about holidays; organize a trip; talk about prices; exchange holiday greetings; ask about and describe the weather; describe personality; ask for and provide addresses; talk about family; talk about dishes and meals; express preferences; order at a restaurant; talk about clothing styles; describe an article of clothing; talk about modes of transportation in cities; express surprise; talk about past events; describe when a past event occurred; describe the location of places in a city; talk about sports; express agreement, disagreement, and disagree with others. Methods of learning: Interactive method: group work, reports, homework, seminar papers, discussion, debate, 12. cooperative studying techniques, individual tasks, simulation of extra-curricular educational activities, individual studying. 13. Total amount of available time: 120 14. Distribution of available time: 2+1+1 Lectures / theoretical, contact 15.1 30 hours Forms of teaching / teaching, e-learning 15. learning activities Exercises (practical, laboratory, 15. hours 15.2 theoretical, seminars, team work) 16.1 Projects 15 hours Other forms of 16.2 Individual work 30 hours 16. activities 30. hours 16.3 Home learning Method of assessment 17.1 Tests / Oral Exam 70 scores Individual work (presentation, 17. 17.2 10 scores projects, practical) 20. scores 17.3 Activity and participation up to 50 points 5 (five) (F) 51 to 60 points 6 (E) (six) 18. Assessment Criteria (scores/ points) 61 to 70 points 7 (seven) (D) 71 to 80 points 8 (C) (eight) 81 to 90 points 9 (B) (nine)

				91 to 100 points	10 (ten)	(A)		
19.	Signature appro final exam/ or tra			60% active participation at the course				
20.	Language of teaching / study			English and French				
21.	Methods of measuring / monitoring the quality of teaching			Standardized motor tests, Self-evaluation	observation, sur	vey		
	Literature							
	22.1	Basic I	iterature					
		No	Author	Title	Publisher	Year		
22.		1.	CAPELLE, G. & MENAND,R.	Taxi 1 (Méthode de français)	Edilingua	2003		
		2.	CAPELLE, G. & MENAND,R.	Taxi 1 (Cahier des exercices)	Edilingua	2003		
		3.						
	22.2	Additic	onal literature					
	No Author 1. 1.		Title	Publisher	Year			
		2.						
		3.						

Apper	ndix 3.	Program of the Co	ourse for First cy	cle st	udies			
1.	Title of Cou	ırse	Russian language level A1.2					
2.	Code		4FF101323					
3.	Study program		Computer Eng	ineer	ing and Technologies			
4.	Organizer o program	of the Study	Goce Delchev University – Stip Faculty of computer science					
5.	Level (first, cycle of stu	second or third Idies)	First cycle					
6.	Academic y	year/ semester	First year / Second semester	7.	Number of ECTS	4		
8.	Professor (s)	Igor Stanojoski					
9.	Requireme the course	nts for enrolling	None					
10.	The main c	•	rse is to train stud		in practical Russian lar pugh which they will acq			

reading and writing habits. Contents of the course During the course, the main emphasis will be on mastering the Russiar	Russian words - 700 - 1000 words; developed habits of speech perception in the form of monologue and dialogue; developed habits of using colloquial speech, as well as developed						
Contents of the course	as well as developed						
During the course, the main emphasis will be on mastering the Russian							
 grammatical categories in the Russian language: cases, verbs, present time, sentences, numbers, and perfect and imperfect verb forms. Non-specialized (colloquial) cultural themes shall be used: pets, use of "How old are you?", Profession / job, country and language, description description of home, asking Wh-questions. 	t tense, adjectives, future						
	Interactive method: group work, reports, homework, seminar papers, discussion, debate, cooperative studying techniques, individual tasks, simulation of extra-curricular educational						
13. Total amount of available time: 120							
14. Distribution of available time: 2+1+1							
15. Forms of teaching / 15.1 Lectures / theoretical, contact teaching, e-learning	30 hours						
learning activities Exercises (practical, laboratory, 15.2 15.2 theoretical, seminars, team work)	15 hours						
16.1 Projects	15 hours						
16. Individual work	30 hours						
16.3 Home learning	30 hours						
Method of assessment							
17. Tests / Oral Exam 70 scores	70 scores						
17.2Individual work (presentation, projects, practical)10 scores	10 scores						
17.3Activity and participation20. scores							
up to 50 points	5 (five) (F)						
51 to 60 points	6 (six) (E)						
18. Assessment Criteria (scores/ points) 61 to 70 points	7 (seven) (D)						
71 to 80 points	8 (eight) (C)						
81 to 90 points	9 (nine) (B)						
	10 (ten) (A)						
91 to 100 points	60% active participation at the course						
91 to 100 points	at the course						
91 to 100 points Signature approval and entrance to the	at the course						
19. Signature approval and entrance to the final exam/ or transition in the next year 60% active participation a							
19. Signature approval and entrance to the final exam/ or transition in the next year 60% active participation a 20. Language of teaching / study English and Russian 21 Methods of measuring / monitoring the Standardized motor tests							

	No	Author	Title	Publisher	Year
	1.	Ирина Осипова	«Ключ» - Учебник русского языка для начинающих.	Corvina, Москва	2005
	2.				
	3.				
22.2	Additic	onal literature			
	No	Author	Title	Publisher	Year
	1.	S. A. Khavronina, A. I. Shirochenskaya	Русский язык в упражнениях. (Russian in exercises)	Русский язык. Курсы 2017 г.	2017
	2.	Л. В. Московкин, Л. В. Сильвина	Русский язык. Учебник для иностранных студентов подготовительных факультетов	СМИО Пресс, Санкт- Петербург	2006
	3.				

			Program of the	Cοι	Irse for First cycle studies	•		
1.	Title of Cou	rse	Sport and recreation					
2.	Code		2SC100121					
3.	Study progr	am	Computer Engir	eerir	ng and Technologies			
4.	Organizer o	of the Study	Goce Delce Uni	versi	ty – Stip			
	program		Faculty of Comp	outer	science			
5.	Level (first,	second or third	First cycle					
	cycle of stu	dies)						
6.	Academic y	ear/ semester	First year/	7.	Number of ECTS	0		
			First or second					
			semester					
8.	Professor (s)	Assoc. prof. Bilja	ana I	Popeska, PhD			
9.	Requireme	nts for enrolling	None					
	the course							
10.	Aims of the	course (competend	ces):					
	To fulfill stu	dents` needs for me	ovement and phys	sical	activity; to improve and deve	elop students		
	movement	skills and motor abi	lities; to adopt info	ormat	ion and knowledge for inde	pendent choice and		
	participation	n in adequate type o	of physical activity	and	recreational sport based on	individual needs		
	and prefere	nces; to learn how	to practice differer	nt for	ms of active breaks; to learn	n about the benefits		
	from regula	r physical activity fo	or overall health ar	nd we	ellbeing.			
11.	Contents of	the course (per 15	weeks per semes	ster):				

 1. Basic physical preparation (introduction in basic principles of physical exercises: warm up activities, exercises for overall fitness, cool down activities - application in each workout session; sample of exercises for each muscle group) 2. Basic physical preparation (functional training) 4. Aerobics (type of aerobic depending from the structure of the group: high – low aerobics, step aerobics, tae – bo, body conditioning) 5. Aerobic 6. Outdoor activities – hiking and orienting 7. Ball games (basketball, football) 8. Ball games (basketball, football) 8. Ball games (basketball, football) 9. Table- tennis and badminton 10. Table- tennis and badminton 11. Ball games (volleyball, handball) 12. Ball games (volleyball, handball) 13. Outdoor activities – cycling, rollers or hiking 14. Dances (modern and traditional) 15. Outdoor activities 17. Method of available time: 0+0+2 18. Forms of teaching / 16.1 Projects = 0 hours activities = 0 hours activities = 0 hours activities = 0 hours = 0 ho				nunnuti	, lintro du otio n in	haaia arinaialaa of ah					
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$ \begin{array}{c c c c c c } \mbox{learning activities} & \begin{tabular}{ c c c c c } teaching, e-learning & \end{tabular} & tabua$						tical contact			0 hours		
Image: Section of the section of th	13.		°,	15.1					0 110013		
15.2 theoretical, seminars, team work) 16. Other forms of activities 16.1 Projects 0 hours 16.2 Individual work 0 hours 0 hours 16.3 Home learning 0 hours 17. Method of assessment 0 hours 17.1 Tests / Oral Exam 0 scores 17.2 Individual work (presentation, projects, practical) 0 scores 17.3 Activity and participation 0 scores 18. Assessment Criteria (scores/ points) up to 50 points 5 (five). (F) 51 to 60 points 6 (six) (E) 61 to 70 points 6 (six) (C)		leaning a	Clivilles		-	-			12 hours		
16. activities16.1 ProjectsProjects 0 hours16.2Individual work0 hours16.3Home learning0 hours16.3Home learning0 hours17.Method of assessment0 hours17.1Tests / Oral Exam0 scores17.2Individual work (presentation, projects, practical)0 scores17.3Activity and participation0 scores18.Assessment Criteria (scores/ points)up to 50 points518.Assessment Criteria (scores/ points)0 for to 70 points517.0Individual work (presentation, projects, practical)0 for to 70 points17.3Activity and participation0 scores18.Assessment Criteria (scores/ points)0 for to 70 points517.0Individual work0 for to 70 points717.1Tests / Criteria (scores/ points)0 for to 70 points717.3Activity and participation0 for to 70 points618.Assessment Criteria (scores/ points)10 for 70 points717.1For 70 points7(seven)(D)17.3Activity and participation10 for 70 points1618.Assessment Criteria (scores/ points)17 for 80 points8(eight)19.17 for 80 points8(eight)(C)				15.0		-			12 110015		
activities 16.2 Individual work 0 hours 16.3 Home learning 0 hours 17. Method of assessment 0 for assessment 17.1 Tests / Oral Exam 0 scores 17.2 Individual work (presentation, projects, practical) 0 scores 17.3 Activity and participation 0 scores 18. Assessment Criteria (scores/ points) up to 50 points 5 (five). (F) 18. Assessment Criteria (scores/ points) up to 50 points 5 (five). (E) 61 to 70 points 6 (six) (E) 61 to 70 points 7 (seven) (D)	16	Other form	a of			nars, team work)			0 houro		
Instruction Instruction Instruction 16.3 Home learning 0 hours 17. Method of assessment 0 scores 17.1 Tests / Oral Exam 0 scores 17.2 Individual work (presentation, projects, practical) 0 scores 17.3 Activity and participation 0 scores 18. Assessment Criteria (scores/ points) up to 50 points 5 (five). (F) 51 to 60 points 6 (six) (E) 61 to 70 points 7 (seven) (D) 71 to 80 points 8 (eight) (C)	10.		15 01		-						
17. Method of assessment 0 scores 17.1 Tests / Oral Exam 0 scores 17.2 Individual work (presentation, projects, practical) 0 scores 17.3 Activity and participation 0 scores 18. Assessment Criteria (scores/ points) up to 50 points 5 (five). (F) 61 to 70 points 7 (seven) (D) 71 to 80 points 8 (eight) (C)		activities									
assessment 17.1 Tests / Oral Exam 0 scores 17.2 Individual work (presentation, projects, practical) 0 scores 17.3 Activity and participation 0 scores 18. Assessment Criteria (scores/ points) up to 50 points 5 (five). (F) 61 to 70 points 7 (seven) (D) 71 to 80 points 8 (eight) (C)				16.3	Home learning				0 hours		
17.1Tests / Oral Exam0 scores17.2Individual work (presentation, projects, practical)0 scores17.3Activity and participation0 scores18.Assessment Criteria (scores/ points)up to 50 points5 (five). (F)51 to 60 points6 (six)(E)61 to 70 points7 (seven)(D)71 to 80 points8 (eight)(C)	17.										
17.2Individual work (presentation, projects, practical)0 scores17.3Activity and participation0 scores18.Assessment Criteria (scores/ points)up to 50 points5 (five). (F)51 to 60 points6 (six)(E)61 to 70 points7 (seven)(D)71 to 80 points8 (eight)(C)			-			Γ					
projects, practical) 17.3 Activity and participation 0 scores 18. Assessment Criteria (scores/ points) up to 50 points 5 (five). (F) 51 to 60 points 6 (six) (E) 61 to 70 points 7 (seven) (D) 71 to 80 points 8 (eight) (C)											
17.3Activity and participation0 scores18.Assessment Criteria (scores/ points)up to 50 points5 (five).(F)51 to 60 points6 (six)(E)61 to 70 points7 (seven)(D)71 to 80 points8 (eight)(C)		17.2			entation,				0 scores		
18.Assessment Criteria (scores/ points)up to 50 points5 (five).(F)51 to 60 points6 (six)(E)61 to 70 points7 (seven)(D)71 to 80 points8 (eight)(C)											
51 to 60 points 6 (six) (E) 61 to 70 points 7 (seven) (D) 71 to 80 points 8 (eight) (C)											
61 to 70 points7 (seven)(D)71 to 80 points8 (eight)(C)	18.	Assessme	nt Criteria (s	scores/ poi	nts)		5	(five).	(F)		
71 to 80 points 8 (eight) (C)						-	6	(six)	(E)		
						61 to 70 points	7	(seven)	(D)		
81 to 90 points 9 (nine) (B)						71 to 80 points	8	(eight)	(C)		
						81 to 90 points	9	(nine)	(B)		

				91 to 100 points	10 (ten)	(A)		
19.	Signature approv	/al and e	entrance to the final	60% acti	ive participation at the	he course		
	exam/ or transiti	on in the	e next year					
20.	Language of tea	ching / st	tudy			English		
21.			nonitoring the quality of	Standardized motor tests, observation, survey,				
21.		sunng / 1	nonitoring the quality of	self-evaluation		ourvoy,		
	teaching			Sell-evaluation				
22.	Literature							
	22.1	Basic I	iterature					
		No	Author	Title	Publisher	Year		
		1.	Haywood, K., &	Life span motor	Champaign: IL.	2004		
			Getchell, N.	development	Human Kinetics.			
		2.	Kohl, H., Murray, D., &	Foundations of	Champaign: IL.	2018		
			Salvo, D	Physical Activity	Human Kinetics.			
				and Public Health				
				(Second Edition)				
		3.	Wilmore, J. & Costill, D.	Physiology of	Champaign:	2002		
				sport and	Human Kinetic,			
				exercise,	Illinois			
	00.0		· · · · P(· · · · · ·	(Third edition)				
	22.2	Additio	nal literature					
		No	Author	Title	Publisher	Year		
		1.	Malina, R., Bouchard,	Growth,	Champaign: IL.	2004		
			C. & Bar – Or, O	Maturation and	Human Kinetics.			
				Physical Activity				
				(Second Edition).				
		2.	Beashel, P., Sibon, A.,	Sport examined	Nelson Thornes	2004		
			& Tailor,J		Ltd,			

Annex	c 3.	Program of the	Course for Integ	atec	I Second cycle studies			
1.	. Title of Course		Data Structures and Algorithms					
2.	Code		2FI101921					
3.	^{3.} Study program		Computer Engin	eerin	g and Technologies			
4.	Organizer of the Study program		Goce Delchev University – Stip Computer Science Faculty					
5.	Level (first cycle of stu	, second or third udies)	First cycle					
6.	Academic	year/ semester	Second year / III semester	7.	Number of ECTS	8		
7.	Professor	(s)	Full Professor C	veta	Martinovska Bande			
8.	Requirements the course	ents for enrolling	None					
9.	the course							

						a structures including lir course covers algorithm				
						techniques for designing	g algori	thms in Jav	a.	
10	Represen algorithms binary, bir merge so Technique and back	ting d s for se nary se rt, sele es for trackin	ata wit earchin earch, b ection so design ig. Graj	h array g, inser alanced ort, quid of algo ohs and	ting and deleting of d AVL trees and B ck sort, counting so rithms: divide and	stacks and queues wi data from lists. Trees an trees. Hash tables. Sort ort and heap sort. Asym conquer, dynamic prog gies. Topological sorting	id trave ing algo ptotic a rammir	rsals. Type prithms: inse nalysis, big ng, greedy a	s of trees: ertion sort, Ο, Ω и Θ. algorithms	
11	Methods	of learn	ning:			, e-learning, individual a	nd tear	n projects, o	office	
12		ount of	availat	ole time:	: 8 ECTS x 30 hou	rs a = 240 hours				
13	Distributio	on of a	vailable	e time: 4	5 + 30 + 30 + 60 -	+ 75 = 240 hours (3 + 2	+2)			
14	Forms of	teachir	na 1	5.1	Lectures / theore teaching, e-learn		45 ho	urs		
	/ learning		ies	5.2	Exercises (practi theoretical, semi	cal, laboratory,	30 ho	urs		
			1	6.1	Projects		30 hours			
15	Other forr activities	ns of	1	6.2	Individual work		60 ho	urs		
40	Mathe	,	1	6.3	Home learning		75 ho	urs		
16	Method of assessme									
	17.1		s / Oral			70 scores				
17	17.2		idual wo cts, pra		sentation,	10 scores				
	17.3	Activi	ity and	particip	ation	20 scores				
						up to 50 points	5	(five)	(F)	
						51 to 60 points	6	(six)	(E)	
18	Assessme	ent Cri	teria (s	cores/ r	oints)	61 to 70 points	7	(seven)	(D)	
	7.00000011			00100/ p	, on to j	71 to 80 points	8	(eight)	(C)	
						81 to 90 points	9	(nine)	(B)	
						91 to 100 points	10	(ten)	(A)	
19	exam/ or				ce to the final year	60% active participatio	on at the	e course		
20	Language	e of tea	ching /	study		English				
21	Methods of teachin		suring	/ monito	oring the quality	Standardized motor te Self-evaluation	sts, obs	servation, s	urvey	
	Literature									
22	22.1	Bas			e					
	<i>LL</i> . I		No	Autho	r	Title	Publis	sher	Year	

	1.	Robert Lafore	Data Structures and Algorithms in Java	Sams Publishing	2003		
	2.	Michael Goodrich and Roberto Tamassia	Data Structures and Algorithms in Java	John Wiley	2010		
	3.	Sartaj Sahni	Data Structures, Algorithms and Applications in Java	McGraw Hill	2000		
22.2	Additio	onal literature					
	No	Author	Title	Publisher	Year		
	1.	Miodrag Zivkovic	Algorithms	Faculty of Mathematics, Belgrade, Serbia	2000		
	2.	Niklaus Wirth	Algorithms and Data Structures	Prentice Hall	1985		
	3.	Robert Sedgewick	Algorithms	Addison- Wesley	1983		

Anne	x 3.	Program of the o	ourse for First cy	/cle	studies				
23.	Title of Cou	irse	Digital logic	Digital logic					
24.	Code		2FI102121						
25.	Study prog	ram	Computer Engir	eerir	ng and Technologies				
26.	Organizer o program	of the Study	Goce Delchev L Faculty of Comp						
27.	Level (first, cycle of stu	second or third dies)	First cycle						
28.	Academic y	/ear/ semester	semester						
29.	Professor (s)	Vasko Kokalano	v					
30.	0. Requirements for enrolling None								
31.	After compo	e course (competend etition of the course s that are an integra f the course (per 15	e, students should al part from compu	iter s	the basic concepts of switc ystems	hing algebra and			
32.	Binary arith numbers. E parity. Axio Electronic c of Karnaug and two's c encoders a devices PL Registers a	ametic and complem Binary codes. Error of ms and theorems of components for logi h maps and Quine- complement, shift ar nd decoders. Imple A and PAL.Flip-flop and Counters.	nent arithmetic. Red detection and corr f Boolean algebra c gates. Minimizat McCluskey. Comb nd compare. Comb mentation of switc s. Analysis and sy	epres ectio . Rea ion o pinati pinati hing rnthe	system to another. Binary nu enting negative numbers and n codes: Hamming codes an ilization of switching function f switching functions with a r onal circuits for addition, sub onal circuits: multiplexers, de functions with ROM and pro sis of sequential circuits. Sec	d formats for reals ad codes with as with logic gates. method otraction with single emultiplexers, grammable logic quential Circuits:			
33.	Methods of consultation		theoretical and pr	actic	al exercises, e-learning, tear	m work,			
34.	Total amou	nt of available time	6 ECTS x 30 hou	irs =	180 hours				

35.	Distribu	ution o	f availabl	e time: 30	+ 30 + 30	+ 30 + 60 = 180 hours (2 + 2 +	1)			
	Forms	of tead	china /	15.1	teaching	/ theoretical - contact , e-teaching ks x 2 hours = 30 hours)	30 ho	30 hours		
36.	learnin		0	15.2	exams, p seminar	Theoretical and practical exercises, e- exams, preparation of independent seminar work (15 weeks x 2 hours = 30 hours)				
				16.1	Projects		30 ho	urs		
37.	Other f		of	16.2	Individua	al work	30 ho	urs		
				16.3	Home le	arning	60 ho	urs		
38.	Methoo assess					-				
	17.1	Т	ests / Ora	al Exam		20+20+30 scores				
39.	17.2 Individual work (presentation, practical)				entation,	10 scores				
	17.3	A	ctivity an	d participa	tion	20 scores				
						up to 50 points	5	(five)	(F)	
						51 to 60 points	6	(six)	(E)	
10	A a a a a		Oritorio (a			61 to 70 points	7	(seven)	(D)	
40.	Assess	sment	Chiena (s	scores/ poi	ints)	71 to 80 points	8	(eight)	(C)	
						81 to 90 points	9	(nine)	(B)	
						91 to 100 points	10	(ten)	(A)	
41.				d entrance n in the ne		60% active participation at the course				
42.	Langua	age of	teaching	/ study		English				
43.			neasuring ching	/ monitori	ng the	Standardized motor tests, obs	servatio	n, survey		
	Literatu	ure								
		Basi	c literatur	е						
44.	22.1	No	Autho	or		Title	Publis		Year	
		1.	Cveta	a Martinov	ska	Digitalna logika	Univ. Delce		2011	
	22.2	Addi	tional lite	rature						
		No	Autho	or		Title	Publis	sher	Year	
		1.		Servini ta Servini		Digitalna elektronika l mikroprocesori			2011	
		1.		<u>an Balaba</u> ey Carlsor		Digital Logic Design Pricniples		Wiley &	2011	

Anne	x 3.	Program of the	Course for Firs	t cy	cle studies				
1.	Title of Co	urse	Software Eng	inee	ring				
2.	Code		2FI102021						
3.	Study prog	gram	Computer engi	Computer engineering and technologies					
4.	Organizer program	of the Study	Goce Delchev Faculty of infor						
5.		, second or third udies)	First cycle	First cycle					
6		year/ semester	2 year / III semester	7.	Number of ECTS	8			
7.	Professor	(s)	Prof. Natasha	Koce	eska	·			
8	Requirements the course	ents for enrolling	None						
9	Aims of the course (competences): Gaining a fundamental theoretical knowledge of software engineering and Software Development Life Cycle (SDLC) process. Understanding the basic models of software								
1(This cours Inf Sc Sc de (R Sc Fu Pr Sy Fu De	oftware engineerin oftware process m	ving topics: are engineering g basic concepts odels: waterfall r , V-model, spiral gramming. ent Life Cycle (S quirements engir m specifications //L language systems	and s node moc DLC	software processes el, incremental model, evo lel, Rapid Application Dev) process	•			
1	Methods o Lectures, I		, Numerical exer	cise	s, e-learning, individual a	nd team projects,			
1:	office hour	S							
	Total amo	unt of available tim	ne: 8 ECTS x 30	hou	rs = 240 hours				

1:	Distributio	on of availa	ble time:	45 + 30 + 30 -	+ 60 + 75 = 240 hours (3 + 2 +	2)		
1.	Forms of	teaching	15.1	Lectures / th teaching, e-	neoretical, contact learning	45 ho	urs		
	/ learning	activities	15.2		practical, laboratory, 30 hours seminars, team work)				
			16.1	Projects		30 ho	urs		
1	Other form activities	ms of	16.2	Individual w	ork	60 ho	urs		
			16.3	Home learni	ing	75 ho	urs		
10	Method o assessme			·		•			
	17.1	Tests / Or	ral Exam			70 points			
1	17.2	Individual projects, p		esentation,			1	10 point	
	17.3	Activity ar					2	20 point	
					up to 50 points	5	(five)	(F)	
					51 to 60 points	6	(six)	(E)	
18	A		(61 to 70 points	7	(seven)	(D)	
	Assessm	ent Criteria	(scores/	points)	71 to 80 points	8	(eight)	(C)	
					81 to 90 points	9	(nine)	(B)	
				91 to 100 points	10	(ten)	(A)		
1		e approval a n/ or transit			60% active participat	ion at the	e course		
2	Language	e of teachin	g / study		English				
2	Methods quality of	of measurir teaching	ng / moni	toring the	Standardized tests, observation, survey Self-evaluation				
	Literature	9							
		Bas	ic literatu	ıre					
		No	Author	ſ	Title	Publis	sher	Year	
		1.	lan So	ommerville	Software engineering	Addis Wesle		2009	
2:	22.1	2.		na Koceska, Koceski	Софтверско инженерство		ерзитет е ев" -	2018	
		3. Van Vliet H.		liet H.	Software Engineering - Principles and Practice, (2-nd Edition)	John and S	Wiley Sons	2000	
	22.2	Add	litional lite	erature					
		No	Author	r	Title	Publis	sher	Year	
		1.	Pressr	man R.S.	Software Engineering - A Practicioner's	McGr	aw Hill	2005	

		Approach (6-th Edition)		
2.	Schach S.R.	Object Oriented & Classical Software Engineering, 7-th Edition	McGraw Hill	2006
3.	Pont M.J.	Software Engineering with C++ and CASE Tools	Addison- Wesley	1996

Appen	dix 3.	Program of the Co	ourse for First cycl	e stu	ıdies			
13.	Title of Co	burse	Probability and	Statis	stics			
14.	Code		2FI130221					
15.	Study prog	gram	Computer Engin	eerir	ng and Technologies			
16.	Organizer program	of the Study	Goce Delchev L Faculty of comp					
17.	Level (firs	st, second or third tudies)	First cycle					
18.	Academic	year/ semester	Second year/ third semester	7.	Number of ECTS	4		
38.	Professor	(s)	Prof. Tatjana Ata	anas	ova Pachemska, full profess	or		
39.					[,] program			
40.	The student is expected to know and use the different types of probability, to describe random variables, random vectors to know how to calculate the numerical characteristics of each random variable and vector, to be able to apply the acquired knowledge in concrete real engineering problems. To know and understand the basic concepts and theories of statistics and their flexible use in practice.							
41.	 Combin Fundan Axioma Geome Total Pi Concep Continu Numeri Coefficient Genera Measu Limit t Basic (statistics) Param (probabilit M 	tics of the probabilit tric probability, Con- robability, Bayes Fo- to of random variable uous random variable ous characteristics ts (Pirson, Spirman lization of the notior ures of central tender heorems - law of lar heorems - Central li terms in statistics –	rmutations, variat y theory-experime y space; Classica ditional probability rmulas, Bernoulli e Discrete rando es. Distribution fu of a random varial ency – generalizat ge numbers and a mit theorem, norm population, samp -parametric statist pothesis testing, s (optionally)	nt, ra I defi Sche m va nctio riable ole – ion; appli naliza le, fe	andom event, statistical defir inition of probability eme, Most Likely Number, Po triables. Law of distribution o on of a random variable; e – mathematical expectati random vectors and distribu- cations; ation of random variables, ap eature, data presentation, da	pisson Scheme f discrete random variable on, dispersion, correlation tions		

42.	Methods using IC1		Lectures,	exercises, prepara	ation of a seminar paper	r and p	presentation	ns, teaching with	
43.			able time:	6 ECTS x 30 hou	rs = 180 hours				
44.	Distributio	on of availat	ole time: 3	0+15+15+30+30 =	= 120 hours (2+1+1)				
45.		teaching /	15.1	e-learning	oretical, contact teaching, 30				
40.	learning a	activities	15.2		practical, laboratory, 15 ninars, teamwork)				
			16.1	Projects	15				
46.	Other activities	forms of	16.2	Individual work		30			
			16.3	Home learning		30			
	Method assessm	of ent							
47.	17.1	Tests / Ora	al Exam		70 scores				
47.	17.2	Individual projects, p	work ractical)	(presentation,	10 scores				
	17.3	Activity and	d participa	tion	20 scores				
					up to 50 points	5	(five)	(F)	
					51 to 60 points	6	(six)	(E)	
40	A		(cinto)	61 to 70 points	7	(seven)	(D)	
48.	Assessm	ent Criteria	(scores/ p	oints)	71 to 80 points	8	(eight)	(C)	
					81 to 90 points	9	(nine)	(B)	
					91 to 100 points	10	(ten)	(A)	
49.		e approval transition in		ance to the final /ear	Apart from 42 points from partial exams, completed homework and regularity of lectures, classroom exercises and laboratory exercises				
50.	Language	e of teaching	g / study		English				
51.	Methods teaching	of measurin	g / monito	ring the quality of	Self-evaluation, period	lic test	s, debates		
	Literature	9							
		Basi	c literatur	Э	I				
		No	Autho	r	Title	Publi	sher	Year	
52.		1.	Атана Татја Лазар Карам	на, Коцева	Веројатност (this book will be translated in English)	УГД ISBN 608-2 5	Штип, I 978- 244-591-	2018	
JL.	22.1	2.	Атана Татја Лазар	асова Пачемска на, Коцева рова Лимонка, иазова Елена, Буралиева	Збирка задачи по Веројатност (will be translated in English).	УГД ISBN	Штип I 978- 244-592-	2018	
		3.							
	22.2	Add	itional liter	ature					

No	Author	Title	Publisher	Year
1.				

Appen	dix 3.	Program of the Co	urse for First cycl	e stu	dies					
19.	Title of Co	burse	Theory of Proba	bility						
20.	Code		2FI130121							
21.	Study pro	gram	Computer Engin	eerir	ng and Technologies					
22.	Organizer program	of the Study	Goce Delchev U Faculty of comp							
23.	Level (firs	et, second or third tudies)	First cycle							
24.	Academic	year/ semester	Second year/ third semester	7.	Number of ECTS	4				
53.	Professor	(s)	Prof. Tatjana Ata	anaso	ova Pachemska, full profe	ssor				
54.	Requirements for enrolling the course Enrolment in the first cycle of studies of the study program									
55.	Introduction vectors are and applied statistics a The stude random vector be able	Aims of the course (competences): Introduction and mastery of probability theory, random variables and their distribution functions, random vectors and corresponding distributions, basic limit theorems – law of large numbers, central limit theorem and applicability in technical sciences. Introducing and mastering the basic concepts of mathematical statistics as a prerequisite for working with data. The student is expected to know and use the different types of probability, to describe random variables, random vectors to know how to calculate the numerical characteristics of each random variable and vector, to be able to apply the acquired knowledge in concrete real engineering problems. To know and understand the basic concepts and theories of statistics and their flexible use in practice.								
56.	 Combin Fundan Axioma Geome Total P Concep Continu Numer Coefficient Genera Measu Limit t Basic (statistics) Param (probabilit M M M 	 the basic concepts and theories of statistics and their flexible use in practice. Content of the subject program: Combinatorial elements-permutations, variations, combinations; Fundamentals of probability theory-experiment, random event, statistical definition of probability Axiomatics of the probability space; Classical definition of probability Geometric probability, Conditional probability Total Probability, Bayes Formulas, Bernoulli Scheme, Most Likely Number, Poisson Scheme Concept of random variable. Discrete random variables. Law of distribution of discrete random variable Continuous random variables. Distribution function of a random variable; Numerous characteristics of a random variable – mathematical expectation, dispersion, correlation coefficients (Pirson, Spirman,) Generalization of the notion of random variable – random vectors and distributions Measures of central tendency – generalization; Limit theorems - law of large numbers and applications; Limit theorems - Central limit theorem, normalization of random variables, applications Basic terms in statistics – population, sample, feature, data presentation, data grouping, clustering (statistics) Descriptive statistics, non-parametric statistics Parametric statistics – hypothesis testing, some basic tests (probability theory - applied) 								
57.	Methods of using ICT	of learning: Lectures	s, exercises, prepa	aratic	on of a seminar paper and	I presentations, teaching with				
58.		ount of available time	e: 6 ECTS x 30 h	ours	= 180 hours					
59.	Distribution of available time: $30+15+15+30+30 = 120$ hours (2+1+1)									

60.	Forms of	teaching /	15.1	e-learning	etical, contact teaching,	30				
00.	learning a	activities	15.2	Exercises (p theoretical, semi	ractical, laboratory, nars, teamwork)	15				
			16.1	Projects	Projects			15		
61.	Other activities	forms of	16.2	Individual work						
			16.3	Home learning		30				
	Method assessm	of ent								
62.	17.1	Tests / Ora	al Exam		70 scores					
02.	17.2	Individual projects, p	work ractical)	(presentation,	10 scores					
	17.3	Activity an		tion	20 scores					
					up to 50 points	5	(five)	(F)		
					51 to 60 points	6	(six)	(E)		
60	A	ant Critaria	(ainta)	61 to 70 points	7	(seven)	(D)		
63.	Assessm	ent Criteria	(scores/ po	oints)	71 to 80 points	8	(eight)	(C)		
					81 to 90 points	9	(nine)	(B)		
					91 to 100 points	10	(ten)	(A)		
64.		e approval transition ir		nce to the final rear	Apart from 42 points homework and reg exercises and laborate	ularity	of lectu			
65.	Language	e of teachin	g / study		English					
66.	Methods teaching	of measurir	ng / monito	ring the quality of	Self-evaluation, period	lic tests	s, debates			
	Literature)								
		Bas	ic literature)						
		No	Autho	r	Title	Publi	sher	Year		
67.		1.	Атана Татјан Лазар Карам	на, Коцева	Веројатност (this book will be translated in English)	УГД ISBN 608-2 5	Штип, 978- 244-591-	2018		
	22.1		Атана Татја⊦ Лазар	сова Пачемска на, Коцева ова Лимонка, назова Елена, Буралиева	Збирка задачи по Веројатност (will be translated in English).	ISBN	Штип 978- 244-592-	2018		
	3.									
	22.2	Add	itional litera	ature						
		No	Author	r	Title	Publi	sher	Year		
		1.								

Annex	k 3.	Program	of the co	ourse for First cycle studies							
45.	Title of Co	urse		Professional skills							
46.	Code			2FI130421							
47.	Study prog	jram		Computer engineering and technologies							
48.	Organizer program	of the Study	1	Faculty of Computer Science							
49.		, second or udies)	third	First							
50.		year/ semes	ster	Second ye Third semester	ear / 7. Number of ECTS 4						
51.	Professor	(s)		Asso. Prof.	. Aleks	sanda	ar Krstev PhD				
52.	Requirements the course	ents for enro	olling	None							
53.		e course (co with technic			minary	/, prc	fessional, scientific a	nd degr	ee works.		
54.	Elements introduced	part, main	cally writi part, cond	ng, structur clusion, use	d liter	ature	abor (cover side, te) , summary), program labor, correction, rev	ns for w			
55.		f learning: L eamwork, co		auditory and	laboi	ratory	/ exercises, electronio	cally lea	arning, home	emade	
56.	Total amou	unt of availa	ble time:	4 ECTS x 3	0 hou	rs =	120 hours				
57.	Distribution	n of availabl	e time: 30				hours (2+1+1)				
50	Forms of te	eaching /	15.1	Lectures / theoretical - contact teaching, e-teaching (15 weeks x 2 hours = 30 hours)				30 ho	urs		
58.	learning ad	ctivities	15.2	Theoretical and practical exercises, e- exams, preparation of independent seminar work (15 weeks x 1 hours = 15 hours)				15 ho	urs		
			16.1	Projects				30 hours			
59.	Other form activities	is of	16.2	Individua	al work	ĸ		30 ho	urs		
			16.3	Home lea	arning	ļ		15 ho	urs		
60.	Method of assessme	nt									
	17.1	Tests / Ora	al Exam		20+2	20+3	0 points				
61.	17.2	Individual practical)	work (pre	sentation,	10 p	oints					
	17.3	Activity an	d particip	ation	10+1	10 pc	vints				
				up to	o 50	points	5	(five)	(F)		
					51 to	o 60	points	6	(six)	(E)	
62.	Assessme	nt Criteria (s	scores/ po	pints)	61 to	o 70	points	7	(seven)	(D)	
					71 to	080	points	8	(eight)	(C)	
					81 to	o 90	points	9	(nine)	(B)	

				91 to 100 points	10 (ten)	(A)			
63.			roval and entrance to the transition in the next year	60% success from all pre-exams activities that is 42 points from both colloquia, the seminary, regularity on lectures and exercises					
64.	Langu	age of t	eaching / study	English					
65.		ds of mo	easuring / monitoring the hing	Self-evaluation					
	Literat	ure							
		Basic	literature	·					
66.		No	Author	Title	Publisher	Year			
	22.1	1.	A. Krstev, Z. Zdravev	Academic writhing	UDG	2019			
		2.	Margot Northey/Judy Jevinsky	Writing with meaning	Arberia design, Aunt	2010			
	22.2	Addit	ional literature						
		No	Author	Title	Publisher	Year			

Annex	3.	Program of the c	ourse for First c	ycle	studies			
1.	Title of Cou	irse	Algebraic Structures					
2.	Code		2FI131221					
3.	Study prog	ram	Computer Engir	neerir	ng and Technologies			
4.	Organizer o program	of the Study	Goce Delchev L Faculty of Comp					
5.	Level (first, cycle of stu	second or third dies)	First cycle					
6.	Academic y	vear/ semester	Second year / Third semester	7.	Number of ECTS		4	
7.	Professor (s)	prof. Limonka K	ocev	a Lazarova			
8.	Requirements the course	nts for enrolling	None					
9.	Students to	e course (compete b become familiar w b prove simpler clair	ith the basic algel	oraic	and numerical structure	es, to	solve successfully	
10	Content o Groupoid. S A subgroup	on the subject prog Semigroup. Subgrou b. Finite groups. Ho nedral groups. Symr	ram: upoids. Congruen momorphisms an	d iso	of groupoids. Congruent morphisms of groups. (ation groups. Normal su	Cyclic	and finite Abelian	
11	Methods of learning: Lectures, theoretical and practical exercises, e-learning, teamwork, consultations.							
12	Total amou	nt of available time:	4 ECTS x 30 hou	irs =	120 hours			
13	Distribution of available time: 30 + 30 + 15 + 15 + 30 = 120 hours (2 + 1 +1)							

	Forms	of te	aching /	15.1	teaching	/ theoretical - contact , e-teaching ks x 2 hours = 30 hours)	30 hc	ours	
14	learnin			15.2	exams, p seminar	cal and practical exercises, e- preparation of independent work ks x 1 hours = 15 hours)	30 hc	30 hours	
				16.1	Projects			ours	
15		Other forms of activities			Individua	al work	15 hc	ours	
				16.3	Home le	arning	30 hc	ours	
16	Methoo assess		t				1		
	17.1		Tests / Ora	al Exam		70 scores			
17	17.2 Individual work (presentation, practical)					10 scores			
	17.3 Activity and participation					20 scores			
						up to 50 points	5	(five)	(F)
						51 to 60 points	6	(six)	(E)
4.0			t Onitania (r			61 to 70 points	7	(seven)	(D)
18	Assessment Criteria (scores/ points)					71 to 80 points	8	(eight)	(C)
						81 to 90 points	9	(nine)	(B)
						91 to 100 points	10	(ten)	(A)
19			pproval an or transitio			60% active participation at the course			
20	Langua	age c	of teaching	/ study		English			
21	Methoo quality		measuring aching	ı / monitori	ng the	Standardized motor tests, obs Self-evaluation	ervatio	n, survey	
	Literatu	ure							
		Ba	sic literatur	е					
22		No	Autho	or		Title	Publis	sher	Year
~~	22.1	1.	Peter	J. Camero	on	Notes on Algebraic Structures			2006
		2.	Janko Marai	o Böhm, M is	agdaleen	Introduction to Algebraic Structures Lecture Notes 2019			2019
	22.2 Additional literature								
		No	Autho	or		Title	Publis	sher	Year

Appendix 3.	Program of the Course for First cycle studies
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	-		_								
1.	Title of	Course		Operating Sys	ten	ns					
2.	Code			2FI102421							
3.	Study p	rogram		Computer Engi	nee	neering and Technologies					
4.	Organiz progran	er of the		Goce Delchev Faculty of comp							
5.		first, seco cle of studi		First cycle							
6.	Academ semeste		year/	Second year / IV semester	7	Number of ECTS		6			
1.	Profess	or (s)		Ass. Professor	Mir	jana Kocaleva Vita	anova				
2.	Require	ments g the cours	for se	None							
3.	Aims of	the course	e (compe			epts and way of fur					
4.	and the algorithms for the development of their components, as well as their practical performance. Contents of the course (per 15 weeks per semester): Introduction to operating systems, function, concepts, structure of operating systems. Processes, core concept, program, process, process states, process implementation. Process management, process behaviour, process scheduling algorithms, and threads. Inter process communication and synchronization, race condition, critical section model. Congestion, Resources, Resource Acquisition, Congestion Handling. Memory management, memory address binding, memory allocation algorithms. Virtual memory and paging, page table, paging algorithms. Input/output devices, device classification, I/O system architecture, principles of I/O software. File system, data entities – files, directories, security, and protection of file systems. File system performance, file system examples. Disks and secondary memories, structure of secondary memory, optical disks. Disk Arm Algorithms, Stable Storage, Redundant										
5.	Method		ng: Lectu			nd practical exerci	ses, c	onsultations	; creation o	f an	
6.				· ·		nours = 180 hours					
7.	Distribu	tion of ava	ilable tim	ie: 30+30+30+3	0+6	60 = 180 hours (2+	2+1)				
8.	Forms teaching	of a /	15.1	Lectures / teaching, e-le		oretical, contact ing	30 hours				
_	learning activitie	, ,	15.2	Exercises (p	rac	tical, laboratory, nars, teamwork)	30 hours				
			16.1	Projects			30 ho	urs			
9.	Other activitie		16.2	Individual wor	ſk		30 ho	urs			
			16.3	Home learnin	g		60 ho	urs			
	Method assessr										
10.	17.1	Tests / O	ral Exam	l	7	0 scores					
	17.2	Individual projects,		(presentation,	1	0 scores					
	17.3	Activity a	nd partici	ipation	2	0 scores					
					u	p to 50 points	5	(five)	(F)		
11.	Assessi	ment Criter	ria (score	es/ points)	5	1 to 60 points	6	(six)	(E)		
					6	1 to 70 points	7	(seven)	(D)		

				71 to 80 points	8 (eight)	(C)		
				81 to 90 points	9 (nine)	(B)		
				91 to 100 points	10 (ten)	(A)		
12.			and entrance to the ion in the next year	60% active participation	ation at the cour	se		
13.	Language of	teachin	ig / study	English				
14.	Methods of quality of tead		ring / monitoring the	Self-evaluation				
	Literature							
		Basic	literature					
		No	Author	Title	Publisher	Year		
15.	22.1	1.	William Stallings	Operating Systems: Internals and Design Principles	Prentice Hall	2011		
		2.	Andrew Tannenbaum	Modern operating systems	Pearson Prentice-Hall	2015		
-								
	22.2	Additi	onal literature					
		No	Author	Title	Publisher	Year		
-	-	1.	Andrew Tannenbaum	Modern operating systems	Prentice Hall	2007		

Anne	x 3.	Program of the o	ourse for First cycle studies						
67.	Title of Cou	rse	Operational res	Operational research					
68.	Code		2FI102123						
69.	Study prog	ram	Computer engin	eerir	g and technologies				
70. Organizer of the Study program			Faculty of Comp	outer	Science				
71.	Level (first, cycle of stu	second or third dies)	First						
72.	Academic y	vear/ semester	Second year / Fourth semester	7.	Number of ECTS	6			
73.	Professor (s)	Asso. Prof. Alek	sand	ar Krstev PhD				
74.	Requirement the course	nts for enrolling	None						
75.	Introduction	course (competen in Operational re of i.e., and applicat	esearch through li	n., ir	teger and non-linear p	rogramming, and other			

76.	Models algorith applica	on Ope m, adv tion, the	erational vanced	lin. progra games, nor	LP, graphic mming, in	c solve, simplex method, app teger linearly programming ogramming, methods for solv	g, Analysis	on decis	ions and
77.	Method	ds of lea	arning: L			xercises, numerical exercise	es, electroni	cally learn	ng,
78.						0 hours = 180 hours			
79.	Distribu	ution of	availabl	e time: 30-	+30+30+30)+60 = 180 hours (2+2+1)			
	Forms	of teac	hing /	15.1	teaching	/ theoretical - contact , e-teaching ks x 2 hours = 30 hours)	30 hours	3	
80.	learning a		ms of teaching / ning activities		e-exams independ	cal and practical exercises, , preparation of dent seminar work ks x 2 hours = 30 hours)	30 hours	3	
				16.1	Projects		30 hours	6	
81.	Other f		f	16.2	Individua	al work	30 hours	6	
				16.3	Home lea	arning	60 hours	6	
82.	Methoo				1				
	17.1		ests / Ora	al Exam		20+20+30 points			
83.	17.2	Individual work (presentati				10 points			
	17.3	Ac	ctivity an	d participa	tion	10+10 points			
						up to 50 points	5	(five)	(F)
						51 to 60 points	6	(six)	(E)
84.	Accord	mont (Critoria (scores/ poi	ntc)	61 to 70 points	7	(seven)	(D)
04.	A35635		silleria (a	scores/ por	1115)	71 to 80 points	8	(eight)	(C)
						81 to 90 points	9	(nine)	(B)
						91 to 100 points	10	(ten)	(A)
85.				d entrance n in the ne		60% success from all pre- points from both colloquia lectures and exercises			
86.	Langua	age of t	eaching	/ study		English			
87.	Methoo quality			ı / monitoriı	ng the	Self-evaluation			
	Literatu	ure							
		Basic	: literatur	е					
88.		No	Autho			Title	Publishe	er	Year
	22.1	1.		di A. Taha		Operational research: introduction	Magor, S	Skopje,	2010
		2.	S. Kr	čevinac an	d others	Operational research	Faculty organiza	itional	2004

				science, Belgrade	
22.2	Additio	nal literature			
	No	Author	Title	Publisher	Year
	1.	Dr John J. Petric	Operational research: book first book _ another	Contemporary administration, Belgrade	1974
	2.	A.Krstev, Z.Zdravev, M.Lukarevski	Operational research	UGD	2018

Annex	c 3.	Program	of the C	ourse for Integrated First cycle studies						
1.	Title of Co	urse		Database Syste	ems					
2.	Code			2FI102521						
3.	Study prog	gram		Computer Engineering and Technologies						
4.	Organizer program	of the Stud	у	Goce Delchev U Computer Scien		,				
5.		, second or udies)	third	First cycle						
6.	Academic	year/ seme	ster	Second year / IV semester	7.	Number of ECTS		6		
7.	Professor	(s)		Full Professor C	veta	Martinovska Bande				
8.	Requirements the course	ents for enro	olling	None						
9.	This cours and impler	mentation ir	ndamenta Microsof		_	ement systems, princ	ciples of	f database o	design	
10	Characteri and object normal for operations Integrity c environme	Characteristics of the modern relational database systems. Data models: E-R model, object-oriented and object-relational. Semi-structured models and XML. Functional dependencies and Boyce-Codd normal form. Schema design and normalization. Multivalued dependencies. Relational algebra and operations (selection, projection, product, join). Query language, query processing and optimization. Integrity constraints, assertions, and triggers. System aspects of SQL, SQL in a programming environment. Functions and procedures stored in the schema. Transaction management, recovery and concurrency control. Methods of learning: Lectures, Discussions, Labs, Practical exercises, e-learning, individual and								
11	Methods of		_ectures,	Discussions, Labs	s, Pra	actical exercises, e-le	earning,	individual a	and	
12				6 ECTS x 30 hou	rs a	= 180 hours				
13	Distributio	n of availab	le time: 3	0 + 30 + 30 + 30 +	- 60	= 180 hours (2 + 2 +	1)			
14	Forms of t	eaching /	15.1	Lectures / theo teaching, e-lea			30 hours			
- 1	learning a	•	15.2	Exercises (pra theoretical, ser	ctica	l, laboratory,	30 hc	ours		
			16.1	Projects			30 hc	ours		
15	Other form activities	ns of	16.2	Individual work	ζ.		30 hc	ours		
	douvineo		16.3	Home learning			60 hc	ours		
16	Method of assessme			I						
	17.1	Tests / Or	al Exam		7	0 scores				
17	7 17.2 Individual work (pre projects, practical)			sentation,	1	0 scores				
	17.3	Activity an		ation	2	0 scores				
		I			U	p to 50 points	5	(five)	(F)	
18	Assessme	nt Criteria (scores/ p	oints)	5	1 to 60 points	6	(six)	(E)	
					6	1 to 70 points	7	(seven)	(D)	

				71 to 80 points	8 (eight)	(C)	
				81 to 90 points	9 (nine)	(B)	
				91 to 100 points	10 (ten)	(A)	
19	exam/ or transition		entrance to the final next year	60% active participation at the course			
20	Language of tea	ching / s	tudy	English			
21	Methods of meas teaching	suring / r	nonitoring the quality of	Standardized motor te Self-evaluation	sts, observation,	survey	
	Literature						
		Basic I	iterature				
		No	Author	Title	Publisher	Year	
22	22.1	1.	Hector Garcia Molina, Jeffrey Ullman and Jennifer Widom	Database Systems: The Complete Book	Prentice Hall	2002	
		2.	Ramez Elmastri and Shamkant Navathe	Fundamentals of Database Systems	Addison- Wesley	2007	
		3.	Raghu Ramakrishnan and Johannes Gehrke	Database Management Systems	McGraw Hill	2003	
	22.2	Additio	nal literature				
		No	Author	Title	Publisher	Year	
		1.	Avi Silberschatz, Henry Korth, and S. Sudarshan	Database System Concepts	McGraw Hill	2010	
	2. Paul DuBois		Paul DuBois	MySQL	Addison- Wesley	2008	
		3.	Microsoft SQL Server 2022	https://learn.microsof t.com/en- us/sql/relational- databases/database s/databases?view=s gl-server-ver16	Microsoft	2022	

Anne	x 3.	Course for Firs	st cyc	le studies	Course for First cycle studies					
1.	¹ Title of Course		Visual program	Visual programming						
2.	Code		2FI102621							
3.	Study progra	Computer engir	neerir	ig and technologies						
4.	Organizer of program	Goce Delchev University – Stip Faculty of informatics								
5.	Level (first, s	second or third lies)	First cycle							
6	Academic ye	ear/ semester	2 year / II semester	7.	Number of ECTS	6				
7.	Professor (s)	Prof. Sasho Koceski							
8.	Requiremen the course	ts for enrolling	None							

9	Acquisitio working w of basic p experience (Graphica	vith a visual t vractical knov ce in visual p al User Interf ce in visual p	cal knowle tool for rap wledge of o rogrammir ace - GUI)	edge of Visual Pro id application de object-oriented p ng of Windows ap using Visual C #	ogramming; Gaining p velopment - Visual Str rogramming language oplications with graphi # programming langua VEB applications using	udio 2010 C #; Gair cal user ir ge; Gainii	; The acquisit ning practical nterface ng practical	
1	Contents of the course (per 15 weeks per semester): Fundamentals of visual programming, review of programs for visual programming and review of Visual Studio as a development tool for visual programming; Operating environment of Visual Studio and its configuration; Visual programming - basic visual controls (forms and work with multiple forms, buttons, menus) and events; Visual programming with advanced visual controls: Browse for Folder, Check Box, Checked List Box, Color Dialog, Combo Box, Context Menu Date Picker, Domain Up-Down; Visual programming with advanced visual controls: Flow Layout Panel, Font Dialog, Group Box, Image List, Label, Link Label, List Box, List View; Visual programming with advanced visual controls: Masked Text Box, Menu Strip, Month Calendar, Numeric Up-Down, Open Dialog; Visual programming with advanced visual controls: Progress Bar, Radio Buttons, Rich Text Box, Save dialog, Scroll Bar, Split Container; Visual programming with advanced visual controls: Tab Control, Table, Layout Panel, Text Box; Visual programming with advanced visual controls: Tick Counter, Timer Time Picker, Track Bar, Tree View; Fundamentals of database programming with VS and C #; Fundamentals of database programming with VS and C # Methods of learning:							
1	Methods	•	s, Labs, Nu	imerical exercise	s, e-learning, individu	al and tea	m projects, of	fice
1:		ount of availa	able time: 6	6 ECTS x 30 hou	rs = 180 hours			
1:	Distributio	on of availab	le time: 30	+30+30+30+60 =	= 180 hours (2+2+1)			
1		teaching /	15.1	teaching, e-lea	eoretical, contact 30 hours earning 30 hours actical, laboratory, 30 hours			
	learning a	activities	15.2		ninars, team work)			
			16.1	Projects		30 hours		
1:	Other forr activities	ns of	16.2	Individual work		30 hour	S	
	2011100		16.3	Home learning		60 hour	S	
1	Method of assessme							
	17.1	Tests / Ora	al Exam				70 p	oints
1	17.2	Individual v projects, pr		entation,			10 p	oints
	17.3	Activity and		tion			20 p	oints
		1			up to 50 points	5	(five)	(F)
18	Assessme	ent Criteria (scores/ po	ints)	51 to 60 points	6	(six)	(E)
					61 to 70 points	7	(seven)	(D)

				71 to 80 points	8 (eigh	t)	(い)
				81 to 90 points	9 (nine)		(B)
				91 to 100 points	10 (ten)	(A)
1	Signature appro exam/ or transit		entrance to the final e next year	60% active participa	tion at the course		
2	Language of tea			English			
2	Methods of mea of teaching	asuring /	monitoring the quality	Standardized tests, Self-evaluation	observation, surve	ey	
	Literature						
		Basic	literature				
	22.1	No	Author	Title	Publisher		Yea r
2:		1.	Џон Ц. Мичел	Концепти во програмските јазици	Cambridge University Press преводи од Вла на РМ		201 0
		2.	Хектор Гарсија – Молина, Џефри Д. Улман и Џенифер Видом	Системи за бази на податоци – комплетна книга	Pearson Education- преводи од Влада на РМ		200 9
		3.	Ценифер Тидвел	Дизајнирање интерфејси	Oʻ Reilly Media- преводи од Влада на РМ		200 5
	22.2	Additi	onal literature		-		
		No	Author	Title	Publisher	Y	⁄ear
		1.	Сашо Коцески	Визуелно програмирање	Универзитет Гоце Делчев - Штип	2	2013
		2.	John Sharp	Microsoft® Visual C#® 2010 Step by Step	Microsoft Press	2	2010
		BEN WATSON 3.		C# 4.0 How-To, 2010 SAMS Publisher, ISBN- 13: 978-0-672- 33063-6	SAMS Publisher 20		2010

Annex 3. Program of the co			ourse for First cycle studies		
1.	1. Title of Course		Computer Networks		
2.	2. Code		2FI102721		
3.	^{3.} Study program		Computer Engineering and Technologies		

4.	Organizer program	of the Study		Goce Delc Faculty of					
5.		, second or t udies)	third	First cycle	·				
6.		year/ semes	ster	Second ye Fourth semester	ar /	7.	Number of E	ECTS	6
7.	Professor	(s)		Aleksandra	a Mile	va			
8.	Requirements the course	ents for enro	lling	None					
9.	Students to	e course (co o acquire the ary network	eoretical a	ind practica				er networks, as	s well as of
10	 Introduction in computer networks, protocol architecture, OSI and TCP/IP models, Circuit switching networks vs Packet-switching networks; Physical layer: data transmission, transmission media, signal encoding techniques; Data-link layer: Data link control protocols, HDLC, multiplexing, spread spectrum, MAC sublayer, local networks, topologies, hubs, bridges, switches, Ethernet, Fibre Channel, Wireless LANs (IEEE 802.11); Network layer: routers, internetworking, IPv4, IPv6, ICMP, ARP, RARP, DHCP, multicasting, IGMP, routing protocols (OSPF, RIP, BGP), RSVP, Integrated Services Architecture, Differentiated services, VPN and IPSec; Transport layer: TCP and UDP; Application layer: HTTP, DNS, FTP, SMTP, IMAP, POP3, etc. 								
		-		TP, SMTP	, IMAI	P, PC)P3, etc.		
11	Methods o consultatio		ectures, tł	neoretical a	and pr	actic	al exercises,	e-learning, tea	m work,
12	Total amo	unt of availal	ble time: 6	6 ECTS x 3	0 hou	rs =	180 hours		
13	Distribution	n of available	e time: 30	+ 30 + 30	+ 30 +	+ 60 =	= 180 hours (2	2 + 2 +1)	
14	Forms of to	eaching /	15.1	teaching, (15 wee	, e-tea <mark>ks x 2</mark>	achin <mark>hou</mark>	s = 30 hours)		
	learning ad	•	15.2	exams, p seminar	orepar work	ation	ctical exercis of independe rs = 30 hours	ent	Durs
		_	16.1	Projects				30 ho	ours
15	Other form activities	is of	16.2	Individua	l work	(30 ho	ours
					lome learning 60 hours				
16	Method of assessme	nt							
	17.1 Tests / Oral Exam					70 scores			
17	17.2	Individual v practical)	work (pres	entation,	10 s	cores	3		
	17.3	Activity and	d participa	ition	20 s	cores			

					_					
				up to 50 points	5	(five)	(F)			
				51 to 60 points	6	(six)	(E)			
18	A			61 to 70 points		(seven)	(D)			
	Asses	sment CI	riteria (scores/ points)	71 to 80 points	8	(eight)	(C)			
				81 to 90 points	9	(nine)	(B)			
				91 to 100 points	10 (ten)		(A)			
19			oval and entrance to the ransition in the next year	60% active participation at the	course	9				
20	Langu	age of te	aching / study	English						
21		ds of me of teach	asuring / monitoring the ing	Standardized motor tests, obs Self-evaluation	ervatio	n, survey				
	Literat	ure								
		Basic	literature							
22		No	Author	Title	Publisher		Year			
22	22.1	1.	William Stallings	Data and Computer Communications, 8 th Edition - има превод на макед. јазик (9 th Edition)	Prent	ice Hall	2007 (2010)			
		2.	Andrew S. Tanenbaum, David J. Wetherall	Computer Networks, 5 th Edition	Prent	ice Hall	2010			
	22.2	Additio	onal literature							
		No	Author	Title	Publis	sher	Year			
		1.	Alberto Leon-Garcia, Indra Widjaja	Communication Networks: fundamental concepts and key architectures, 2 nd Edition	McGraw-Hill 2003					

Append	lix 3.	Program of the C	ourse for First cy	cle s	tudies			
1.	Title of Co	ourse	Computational tools in engineering					
2.	Code		2FI102023					
3.	Study pro	gram	Computer Engir	neeri	ng and Technologies			
4.	Organizer program	r of the Study	Goce Delchev University – Stip Faculty of computer science					
5.	Level (firs	t, second or third tudies)	First cycle					
6.	Academic	: year/ semester	2/4	7.	Number of ECTS	6		
1.	Professor	r (s)	Prof. Vlado Gicev					
2.	Requirem	ents for enrolling	none					
3.	Aims of the course (competences):							

	Contents	of the cour	rse (per 15	weeks per seme	ester):				
4.	auto cori eigenveo	relation and ctors in eng	l cross coi ineering. I	rrelation. Eigenva ntroduction in pa	rms. Time series and o lues and eigenvectors. rtial differential equatio les. Initial and boundar	Application of e	eigenvalues and olution of partial		
5.					work assignments, min	•			
6.	Total am	ount of ava	ilable time	: 6 ECTS x 30 ho	urs = 180 hours				
7.	Dictributi	on of availa	bla tima: '	20 1 20 1 20 1 20	+ 60 = 180 hours (2 +	2 + 1)			
8.		teaching /	15.1		theoretical, contact	,	nours		
	learning		15.2	Exercises (pr	ractical, laboratory, inars, team work)	30 ł	nours		
	16.1			Projects		30 h	nours		
9.	Other activities	forms of	16.2	Individual work		30 h	nours		
	activities		16.3	Home learning		60 ł	nours		
	Method assessm	of							
10.	17.1	Tests / Ora	al Exam		70 scores				
10.	17.2	Individual	work	(presentation,	10 scores				
-	17.3	projects, p Activity an		ation	20 scores				
			<u> </u>		up to 50 points	5 (five)	(F)		
					51 to 60 points	6 (six)	(E)		
11.			, ,		61 to 70 points	7 (seven)	(D)		
	Assessm	nent Criteria	(scores/	Doints)	71 to 80 points	8 (eight)	(C)		
					81 to 90 points	9 (nine)	(B)		
					91 to 100 points	10 (ten)	(A)		
12.		e approval transition in		nce to the final year	Gaining at least 42 during the semester midterm exams, 10 p from presence on lect	r from which: oints from proje	40 points from ct and 20 points		
13.	Languag	e of teachir	ng / study		English				
14.	Methods of teachi		ng / monit	oring the quality	-				
	Literature	е							
		Bas	ic literatur	9					
15.		No	Autho		Title	Publisher	Year		
	22.1	1.	E Krey	/szig	Advanced engineering mathematics	John Wiley & Sons	1999		
		2.							

	3.							
22.2	Additio	dditional literature						
	No	Author	Title	Publisher	Year			
	1.							

Append	lix 3. Prog	ram of the C	ourse for First cy	cle :	studies			
1.	Title of Course		Computer Arch	itect	ure			
2.	Code		2FI103321					
3.	Study program		Computer Engi	Computer Engineering and Technologies				
4.	Organizer of program	the Study	Goce Delchev Faculty of com					
5.	Level (first, sec cycle of studies		First cycle					
6.	Academic year	semester	Third / V	7.	Number of ECTS	8		
1.	Professor (s)	Professor (s) Ass. Professor Dusan Bikov						
2.	Requirements f the course	or enrolling	None					
3.		course is for	students to bec	ome	familiar with the compone	nts of modern computer		
4.	 systems and their functionality. Contents of the course (per 15 weeks per semester): Introduction, computer system design and concepts, historical development, contemporary trends in development. Data presentation and logic circuits, number systems, binary operations, nomenclature. Hardware organization, single and multiple processor systems, multiple function computation, structure of a modern computer system. Architecture of a simple computer, organization of central processing unit, bus. System clock, I/O devices, memory organization and addressing, instruction processing, assembly language. Instruction set, instruction formats, addressing methods. Arithmetic logic unit, architecture, functional units, real implementations. Control unit and microprogramming, functional description, microprogramming, nano-programming. Memory organization, memory types, memory hierarchy, cache memory, virtual memory. CPU Chips and Buses, CPU Chips, Buses, Bus Arbitrage, Bus Operations. Examples of CPU chips and buses, Pentium IV –CPU, ISA bus, PCI bus, PCI Express bus, USB. I/O units and data storage systems, I/O architectures, magnetic disk technology, optical disks. 							
5.	Methods of lear Lectures, theor	ning: etical and p	ractical exercise	s, co	onsultations, seminar work colloquiums; consultations.			
6.	Total amount of	f available tir	me: 8 ECTS x 30) hou	irs = 240 hours			
7.	Distribution of a	vailable time	e: 45+30+30+60-	+75 :	= 240 hours (3+2+2)			
8.	Forms of teaching 15.1 Lectures / theoretical, contact teaching, e- learning 45 hours							
	/ learning activities Exercises (practical, laboratory, theoretical, 30 hours 15.2 seminars, teamwork)							
9.	Other forms	of 16.1	Projects			30 hours		
	activities	16.2	Individual wor	k		60 hours		

			16.3	Home learning				75 hours		
10.	Method assessm	of nent								
	17.1	Tests / Ora	al Exam		70 scores					
	17.2	Individual work (presentation, projects, practical)			10 scores					
	17.3	Activity an	d particip	ation	20 scores					
					up to 50 points	5	(five)	(F)		
					51 to 60 points	6	(six)	(E)		
11.	Assessment Criteria (scores/ points)			61 to 70 points	7	(seven)	(D)			
				71 to 80 points	8	(eight)	(C)			
				81 to 90 points	9	(nine)	(B)			
					91 to 100 points	10	(ten)	(A)		
12.		e approval r transition i		ance to the final t year	60% active participation at the course					
13.	Language of teaching / study				English					
14.	Methods of measuring / monitoring the quality of teaching				Self-evaluation					
	Literature									
		Bas	ic literatur	e	L					
		No	Autho	r	Title	Publis	sher	Year		
15.	22.1	1.	Williar	m Stallings	Computer Organization and Architecture: Designing for Performance	Prenti	ice Hall	2009		
		2.	Andre Taner	w S. nbaum	Structured Computer Organization	Pears Colleo		2006		
		3.		L. Hennessy, A. Patterson	Computer Architecture: A Quantitative Approach	Morga Kaufn		2006		
	22.2	Add	itional lite	rature						
		No	Autho	r	Title	Publis	sher	Year		
		1.								
	2.									

Appendix 3.		Program of the Course for First cycle studies		
1.	Title of Course		Internet Programming	
2.	Code		2FI103421	

3.	Study pr	ogram		Computer Engir	neer	eering and Technologies				
4.	Organize program	er of the	Study	Goce Delchev University – Stip Faculty of computer science						
5.		st, second	or third							
6.		ic year/ sen	nester	Third / fifth	7.	Number of ECTS		8		
1.	Professor (s)			Ass. Prof. Dr. Aleksandar Velinov						
2.	Requirer	ments for er se	nrolling							
3.	Aims of the course (competences): Introduction to web development using PHP programming language, MySQL, HTML5, Bootstrap, JavaScript an JQuery.									
4.	Contents of the course (per 15 weeks per semester): - Introduction, Web architecture; - Introduction to HTML and XHTML; - Introduction to Bootstrap - Introduction to JavaScript and JQuery - Introduction to PHP; - PHP files; - Strings and functions in PHP, regular expressions; - Strings and sessions; - Introduction to web applications with databases; - Searching web-oriented databases; - Searching web-oriented databases; - User driven search; - Databases in web applications; - Authentication - Security of web applications									
5.	Methods	- Analysis of web applications Methods of learning: Lectures, laboratory exercises, e-learning, seminar work, team work,								
6.	consultations. Total amount of available time: 8 ECTS x 30 hours = 240 hours									
7.	Distribut	ion of availa	able time	e: 45+30+30+60+	-75 =	= 240 hours (3+2+2)			
8.	/	Forms of teaching / learning activities		Lectures / theoretical, contact teaching, e-learning Exercises (practical, laboratory, theoretical, seminars, teamwork)			45 hours 30 hours			
	Other forms of activities		15.2 16.1	Projects			30 hours			
9.			16.2	Individual work			60 hours			
			16.3	Home learning			75 hours			
	Method assessm	of ient								
10.	17.1 Tests / Oral Exam		70 scores							
	17.2 Individual work projects, practical)									
	17.3 Activity and partici			pation 20 scores						
11.	Assessment Criteria (scores/ points)				u	p to 50 points	5	(five)	(F)	
					5	1 to 60 points	6	(six)	(E)	

1								
				61 to 70 points	7 (seven)	(D)		
				71 to 80 points	8 (eight)	(C)		
				81 to 90 points	9 (nine)	(B)		
				91 to 100 points	10 (ten)	(A)		
12.	Signature app exam/ or trans		nd entrance to the final the next year	60% success from all pre-exam activities ie. 42 points from the two colloquiums, the seminar paper, attendance at lectures and exercises				
13.	Language of te	eaching	/ study	English				
14.	Methods of quality of teac		ing / monitoring the	Self-evaluation				
	Literature							
		Basic	literature					
	22.1	No	Author	Title	Publisher	Year		
15.		1.	Anuradha A. Puntambekar	Internet Programming	Technical Publications	2020		
10.		2.	Scobey, Pawan Lingras	Web Programming and Internet Technologies	Jones & Bartlett Publishers	2016		
		3.	Robin Nixon	Learning PHP, MySQL & JavaScript: With jQuery, CSS & HTML5	O'Reilly Media	2015		
	22.2	Additio	onal literature					
		No	Author	Title	Publisher	Year		
		1.	Kris Jamsa	Introduction to Web Development Using HTML 5	Jones & Bartlett Publishers	2014		
		2.	Max Bramer	Web Programming with PHP and MySQL: A Practical Guide	Springer	2015		

Anne	x 3.	Program of the	Course for First	ourse for First cycle studies					
1.	Title of Cou	ırse	Computer Graphics and Visualization						
2.	Code		2FI103521						
3.	Study prog	ram	Computer engineering and technologies						
4.	Organizer o program	of the Study	Goce Delchev University – Stip Faculty of informatics						
5.	Level (first, cycle of stu	second or third idies)	First cycle						
6.	Academic	year/ semester	3 year / V semester	6					
7.	Professor (s)	Prof. Sasho Ko	cesk	i				

8.	Requirem the course	ents for enr	olling	None							
	Aims of th	ne course (c	•	,							
	• T	his course a	aims to int	roduce students t	o computer graphic	S.					
	• T	o give an ov	verview of	the technologies	and devices used in	n compu	ter graphics:				
	• V	ideo control	llers, mon	itors, walkers, poi	nting devices.						
9.		o familiarize ased	e students	with the theoretic	al concepts on whic	ch compi	uter graphics	sis			
		o introduce raphics and		•	thods and technique	es used i	n computer				
		o introduce mphasis on		to the principles o	f graphics systems	and API	s with main				
	• T	o give stude	ents practi	cal programming	skills in the field of	compute	r graphics				
10	This cours Computer foundation Removal/ technique	Contents of the course (per 15 weeks per semester): This course covers the following topics: Introduction to computer graphics and visualization, Computer Graphics Devices, Computer Graphics libraries and OpenGL, Mathematical oundations for Computer Graphics, Geometry for KG, 3D views, 3D transformations, Removal/Clipping of invisible surfaces, Rasterization and filling, Anti-aliasing, Photogrametry echniques, Computer games, Information visualization – methods, techniques and tools, Applicative software for Computer Graphics									
1'	Methods Lectures,	of learning: Discussions			es, e-learning, indivi	dual and	team projec	sts,			
12	office hou		able times	6 ECTS x 30 hou	- 100 hours						
1:			able time.	6 ECTS X 30 HOL							
	Distributio	n of availab	ole time: 3		= 180 hours (2+2+1						
1	Forms of		15.1	Lectures / theor teaching, e-lear	ning	30 hours					
	learning a	ctivities	15.2	Exercises (prac theoretical, sem	tical, laboratory, inars, team work)	30 hours					
			16.1	Projects		30 hou	rs				
1:	Other forr activities	ns of	16.2	Individual work		30 hou	rs				
	dolivilieo		16.3	Home learning		60 hou	rs				
16	Method of assessme			•							
	17.1	Tests / Ora	al Exam				70) points			
17	17.2	Individual projects, p		sentation,			10) points			
				ation			20				
	17.3	Activity an	id participa	allon) points			
	17.3	Activity an	id participa		up to 50 points	5	(five)	(F)			
18					up to 50 points 51 to 60 points	5 6					
18		Activity an					(five)	(F)			

				81 to 90 points	9	(nine)	(B)
				91 to 100 points	10	(ten)	(A)
	exam/ or transit	oval and ion in th	entrance to the final e next year	60% active particip	bation at t	the course)
20	Language of tea	aching /	study	English			
2′	Methods of mea of teaching	asuring /	monitoring the quality	Standardized tests Self-evaluation	, observa	ation, surv	еу
	Literature						
		Basic	literature	-			
		No	Author	Title	Publish	er	Year
22	22.1	1.	Foley, J., van Dam, A., Feiner, S., Hughes, J.	Computer Addison Wesler Graphics – Principles and Practice (3rd edition in C)		n Wesley	2013
		2.	Watt, Alan	3D Computer Graphics	Addison Wesley 2		2000
		3.	Sasho Koceski	Графика и визуелизација	Универ Гоце Де Штип		2016
	22.2	Additio	onal literature				
		No	Author	Title	Publish	er	Year
	1.		Dave Shreiner, D., Woo, M., Neider, J., Davis, T.	OpenGLAddisonWeslerProgrammingProfessionalGuide:TheProfessionalOfficialGuide toLearningOpenGL,Version2(5th Edition)			2005
		2.	Jeffrey J. McConnell	Computer Graphics: Theory Into Practice	Jones a Bartlett Publish		2009

Annex	(3.	Program of the c	ourse for First cycle studies					
1.	1. Title of Course		Advanced algorithms					
2.	Code		2FI131721					
3.	Study program		Computer Engineering and Technologies					
4.	Organizer of the Study program		Goce Delchev University – Stip Faculty of Computer Sciences					
5.	Level (first, cycle of stu	second or third dies)	First cycle					
6.	Academic y	rear/ semester	Third year / Fifth semester					

7.	Professor	(s)		Natasha S	tojkovikj				
8.	Requirements the course	ents for enro	olling	None					
9.	Aims of the	e course (co o acquire th			al knowledge for design and ana	alyse of	f various		
10 11 12	Contents of Introductio big Ο, Ω μ Ramdomiz Technique and backtr Algorithm, algorithm. Augmentin Methods o consultatio	of the course n to time an O. Data stru- ed algorithr s for design acking. Gra Shortest pa Spanning tr g path, Min f learning: L ons.	d space ca uctures: st n.: Las Ve of algorith aph algorith th Algorith ees: Krush imum cut, ectures, th	omplexity o acks ,queu gas algoritl nms: divide ms:Depth F ims:Dijkstra kal's algorit Ford-Fulke neoretical a	emester): of algorithms. Analysis of algorit les, linked lists, treesbinary sea hm and Monte Calro algorithms and conquer, dynamic program First Search (DFS) Algorithm, E a's algorithm, Bellman-Ford algo hm, Prim algorithm. Flow netwo erson algorithm and practical exercises, e-learnin 0 hours = 120 hours	rch tree . Sortin nming, Breadth orithm, ork: Res	e, hash table og algorithm: greedy algo First Searc Floyd–Wars sidual netwo	es. rithms h (BFS) shall	
13	Distribution	n of availabl	e time: 30	+ 15 + 30	+ 30 + 15 = 120 hours (2 + 1 +1)			
14	Forms of to	eaching /	15.1	Lectures / theoretical - contact teaching, e-teaching (15 weeks x 2 hours = 30 hours)			ours		
	learning ad	ctivities	15.2	Theoretical and practical exercises, e- exams, preparation of independent seminar work (15 weeks x 1 hours = 15 hours)			ours		
ĺ			16.1	Projects		30 hc	ours		
15	Other form activities	is of	16.2	Individua	l work	30 hours			
			16.3	Home learning			15 hours		
16	Method of assessme	nt							
	17.1	Tests / Ora	al Exam		70 scores				
17	17.2	Individual practical)	work (pres	entation,	10 scores				
	17.3	Activity and	d participa	tion	20 scores				
					up to 50 points	5	(five)	(F)	
]					51 to 60 points	6	(six)	(E)	
18	A	nt Criteria (s	normal na	into)	61 to 70 points	7	(seven)	(D)	
	Assessme	ni Unieria (s	scores/ po	ints)	71 to 80 points	8	(eight)	(C)	
					7 to 80 points8(eight)81 to 90 points9(nine)				
						Ũ	((B)	
					91 to 100 points	10	(ten)	(A)	

20	Langua	age of te	aching / study	English					
21		ds of mea of teach	asuring / monitoring the ing	Standardized motor tests, ob Self-evaluation	servation, surve	у			
	Literatu	ure							
		Basic I	iterature						
00	22	No Author		Title	Publisher	Year			
22	22.1	1. Thomas H. Cormen Charles E. Leiserson Ronald L. Rivest Clifford Stein		Introduction to Algorithms, 3rd Edition	MIT Press	2009			
		2.	Robert Lafore	Data structures and algorithms in Java	Sams	2003			
	22.2	Additio	onal literature						
		No	Author	Title	Publisher	Year			
		1.	<u>Michael Goodrich</u> <u>Roberto Tamassia</u>	Data Structures and Algorithms in Java	John Wiley	2010			

Appen	dix 3.	Program of the	Course for Firs	t cyo	cle studies				
1.	Title of C	Course	Parallel Programming						
2.	Code		2FI131821						
3.	Study pr	ogram	Computer En	gine	ering and Technologies				
4.	Organiz program	er of the Study	Goce Delcher Faculty of cor		iversity – Stip ter science				
5.	Level (f	irst, second or le of studies)	First cycle						
6.	Academ semeste	,	Third / V 7 Number of ECTS 4						
1.	Professo	or (s)	Ass. Professo	Ass. Professor Dusan Bikov					
2.	Require enrolling	ments for the course	None						
3.	The aim of parall	el programing, b	or students to b y presenting th	ne m	nodel of heterogeneous	c principles and characteristics parallel programming. For the			
4.	scatter, gather, reduce, etc. Memory model and different types of variables. Flow control and synchronization. Warp shuffles, and reduction / scan operations. Parallel implementation of matrix multiplication. Parallel Patterns, Convolution, Scan, Histogram. Parallel Sorting Algorithms. Parallel								
5.	sorting algorithms. Optimizing MPI and CUDA programs. Methods of learning: Lectures, theoretical and practical exercises, consultations, seminar work / project; home study, homework, preparatory teaching for exams and colloquiums; consultations.								

6.	Total a	mount of av	vailable t	ime: 4 ECTS x 3	30 hours = 120 hours	;			
7.	Distribu	ition of ava	ilable tim	ie: 30+15+30+3	0+15 = 120 hours (2-	+1+1)			
8.	Forms teachin	of g /	15.1	Lectures / the e-learning	oretical, contact teac	hing,			30 hours
	learning activitie		15.2	Exercises theoretical, se	(practical, labora minars, teamwork)	atory,			15 hours
	ſ		16.1	Projects					30 hours
9.	Other activitie	forms of s	16.2	Individual wor	k				30 hours
			16.3	Home learning	9				15 hours
	Method assess								
10	17.1	Tests / O	ral Exam		70 scores				
	17.2	Individua projects,		(presentation,	10 scores				
	17.3	Activity a	nd partic	ipation	20 scores				
					up to 50 points	5	(five)	(F)	
					51 to 60 points	6	(six)	(E)	
11	Assess	ment Crite	ria (score	es/points)	61 to 70 points	7	(seven)	(D)	
	7.00000				71 to 80 points	8	(eight)	(C)	
					81 to 90 points	9	(nine)	(B)	
					91 to 100 points	10	(ten)	(A)	
12	final ex			ntrance to the the next year	60% active particip	ation a	at the cou	rse	
13	Langua	ge of teach	ning / stu	dy	English				
14		ls of meas of teaching		monitoring the	Self-evaluation				
	Literatu	ire							
		Bas	sic literatu	ure					
		No	Autho	or	Title	Publ	isher	Year	
15		1.	Calvi Snyd		Principles of Parallel Programming	Pear	rson	2008	
13	22.1	2.	D. Ki	rk and W. Hwu	Programming Massively Parallel Processors – A Hands-on Approach	Moro Kauf	Edition, gan man isher	2013	
		3.	Micha	ael J, Quinn	Parallel Programming in C with MPI and OpenMP	Scie	ineering	2003	
	22.2	Ado	litional lit	erature	1	r			
		No	Autho	or	Title	Publ	isher	Year	

1		
1.		

Annex	3.	Program	of the co	urse for First cycle studies				
1.	Title of Cou	rse		Network Protocols				
2.	Code			2FI132021				
3.	Study progra	am		Computer Engineering and Technologies				
4.	Organizer o program	f the Study	,	Goce Delchev University – Stip Faculty of Computer Sciences				
5.	Level (first, s		third	First cycle				
6.	Academic y		ster	Third year / Fifth semester7.Number of ECTS	4			
7.	Professor (s	3)		Aleksandra Mileva				
8.	Requirements for enrolling the course None							
9.	Aims of the course (competences): Students to acquire theoretical and practical knowledge of network protocols and network administration, as well as of contemporary network technologies and standards							
10	Contents of the course (per 15 weeks per semester): Router configuration and management Basic switch configuration and management Virtual local networks (VLANs) Configuration of Router-on-a-stick and multilayer switch, Dynamic Trunking Protocol – DTP, VLAN Trunking Protocol - VTP Spanning Tree Protocol (STP) and Rapid STP First Hop Redundancy Protocol (FHRP), and Level 2 discovery protocols (Cisco Discovery Protocol - CDP, Layer discovery Protocol - LLDP) Virtualization, installing and configuring some virtualization software (Virtual Box or VMWare) DHCP and DHCP server installation, configuration and management DNS and DNS server installation, configuration and management							
11	Virtual Priva SNMP and I	Network M	anageme		a toam work			
	consultation	IS.	5510183, II	היסויסווסמו מווע אומטווסמו פאפורטוסבס, ב-ופמוזווו				
12	Total amour	nt of availa	ble time: 4	4 ECTS x 30 hours = 120 hours				
13	Distribution	of available	e time: 30	+ 15 + 30 + 30 + 15 = 120 hours (2 + 1 +1)			
14	Forms of tea	aching /	15.1	Lectures / theoretical - contact teaching, e-teaching (15 weeks x 2 hours = 30 hours)	30 hours			
	learning act		15.2	Theoretical and practical exercises, e- exams, preparation of independent seminar work (15 weeks x 1 hours = 15 hours)	15 hours			
15		of	16.1	Projects	30 hours			
	activities		16.2	Individual work	30 hours			

			16.3	Home le	arning	15 hou	rs				
16	Method assessr										
	17.1	Tests / O	oral Exam		70 scores						
17	17.2	Individua practical)	l work (pres	entation,	10 scores						
	17.3	Activity a	nd participa	ition	20 scores						
					up to 50 points	5	(five)	(F)			
					51 to 60 points	6	(six)	(E)			
18	A	nent Criteria	(accreal pa	into)	61 to 70 points	7	(seven)	(D)			
	A226221	neni Chiena	(scores/ po	ints)	71 to 80 points	8	(eight)	(C)			
					81 to 90 points	9	(nine)	(B)			
					91 to 100 points	10	(ten)	(A)			
19	U U	re approval a am/ or transiti			60% active participation at the course						
20	Langua	ge of teachin	g / study		English						
21		s of measurir of teaching	ng / monitori	ing the	Standardized motor tests, obs Self-evaluation	ervation,	survey				
	Literatu	re									
		Basic literat	ure		•						
		No Aut	nor		Title	Publish	ner	Year			
	22.1	1. Will	iam Stalling	S	Data and Computer Communications, 8 th Edition - има превод на макед. јазик (9 th Edition)	Prentic	e Hall	2007 (2010)			
			lrew S. Tane rid J. Wethe		Computer Networks, 5 th Edition	Prentic	e Hall	2010			
22		Additional lit	terature		·	-					
	l f	No Aut	hor		Title	Publish	ner	Year			
	22.2		erto Leon-G a Widjaja	arcia,	Communication Networks: fundamental concepts and key architectures, 2 nd Edition	McGrav	w-Hill	2003			
		2.			Tutorial from Internet about installation, configuration and management of router, switch, DHCP server, DNS server, virtualization software, etc.						

Appendix 3. Program of the C			ourse for First cycle studies
1.	Title of Course		Mobile and Wireless Networks
2.	Code		2FI131921

3.	Study program	Computer Engi	neeri	ng and Technologies						
4.	Organizer of the Study program	Goce Delchev I Faculty of comp								
5.	Level (first, second or third cycle of studies)	First cycle								
6.	Academic year/ semester	2023 / 5	7.	Number of ECTS	4					
1.	Professor	Associate Profe	essor	. Done Stojanov						
2.	Requirements for enrolling the course	/								
3.	Aims of the course (compete The course studies modern t students will be able to unde transmission.	elecommunicatio								
	Contents of the course (per - Signals as carriers of		nest	er):						
	- Sinusoidal signal ele	ements: amplitude	e, ph	ase and frequency						
	- Noise	- Noise								
	- Mathematical model	of the noise								
	- Fourier series									
	- Channel capacity									
	- Commutation techni	ques								
	- ATM switching									
4.	- Antennas									
	- Antenna – types and	specifications								
	- Signal attenuation									
	- Modulation basic pri	nciples								
	- The concept of carri	er								
	- Amplitude modulatio									
	 Frequency modulation 	on								
	- Phase modulation									
	- QAM: quadrature an	nplitude modulati	on							
5.	Methods of learning: Lecture	es, practice in lab	orato	ory, home learning						
6.	Total amount of available tim	ne: 4 ECTS x 30	h = 1	20 h						
7.	Distribution of available time	: 30+30+15+15+	30=1	20 h (2+1+1)						

8.		f teaching	15.1	teaching, e-lear		30			
	/ learning	g activities	15.2		ractical, laboratory, iinars, teamwork)	30			
			16.1	Projects		15			
9.	Other factivities			Individual work		15			
			16.3	Home learning		30			
	Method assessm	of							
10.	17.1	Tests / Or	al Exam		70 scores				
	17.2	Individual projects, p		(presentation,	10 scores				
	17.3	Activity an	nd participa	ation	20 scores				
					up to 50 points	5 (five)	(F)		
					51 to 60 points	6 (six)	(E)		
11.	Accore	nent Criteria	(ccoroc/u	nointe)	61 to 70 points	7 (seven)	(D)		
	A2262211		a (SCOTES/	points)	71 to 80 points	8 (eight)	(C)		
					81 to 90 points	9 (nine)	(B)		
					91 to 100 points	10 (ten)	(A)		
12.		e approval transition i		nce to the final vear	/				
13.		e of teachir		, ,	English				
14.	Methods of teachi		ng / monit	oring the quality	Self-evaluation				
	Literature	*							
		Bas	ic literatur	e	I				
15.		No	Autho	r	Title	Publisher	Year		
10.	22.1	1.		ha, K., Pujolle, d Yahiya, T.A.	Mobile and wireless networks.	John Wiley & Sons.	2016.		
		2.							
		3.							
	22.2	Add	itional liter	rature	-	-	-		
		No	Autho	r	Title	Publisher	Year		
		1.							

Anne	x 3.	Program	of the Co	urse for F	irst cycle	studies				
23	Title of Cou	irse		Microcom	puter Sys	tems				
24	Code			2FI103921						
25	Study prog	ram		Computer	Engineeri	ng and Technologies				
26	Organizer o program	of the Study		Goce Delc Faculty of		rsity – Stip Sciences				
27	Level (first, cycle of stu		third	First cycle						
28	Academic y			Third year Sixth seme		Number of ECTS		6		
29	Professor (s)		Aleksandra	a Stojanov	a Ilievska				
30	the course			None						
31	microcontro	cquire theo ollers, their ation in pra	retical kno similarities ctical appli	wledge about the stand differ ications.	ences, as	elements of micropro well as presenting so			oles for	
32	Contents of the course (per 15 weeks per semester): Introduction to Microcomputer Systems, 8085 Microprocessor Architecture, Machine Cycles, Memory, I/O, Interrupts, Programming with 8085 assembler, Architecture of 8086 and 8088 microprocessors, Machine cycles, memory, input/output, interrupts, 8086 and 8088 assembler language and assembler programming, Introduction to Microcontrollers - Similarities and Differences with Microprocessors. Introduction to some microcontrollers, their architecture, and applications									
33	Methods of learning: Lectures, theoretical and practical exercises, e-learning, team projects, practical work with different tools, consultations.									
34	Total amou					180 hours				
35	Distribution	of availabl	e time: 30	+ 30 + 30	+ 30 + 60	= 180 hours (2 + 2 +	1)			
	E	15.1		Lectures / theoretical - contact teaching, e-teaching (15 weeks x 2 hours = 30 hours)				30 hours		
36	Forms of te learning ac		15.2	Theoretical and practical exercises, e- exams, preparation of independent seminar work (15 weeks x 2 hours = 30 hours)				30 hours		
			16.1	Projects			30 ho	ours		
37	Other forms activities	s of	16.2	Individua	al work		30 ho	ours		
			16.3	Home lea	arning		60 ho	ours		
38	Method of assessmen	t								
	17.1	Tests / Ora project	al Exam / 1	「eam	70 score	S				
39	17.2	Individual practical)	work (pres	entation,	10 score	S				
	17.3	Activity an	d participa	tion	20 score	S				
					up to 50	points	5	(five)	(F)	
40	Assessmer	nt Critoria (scores/ noi	nts)	51 to 60	points	6	(six)	(E)	
40	1911669667	n Unieria (S	200169/ HOI	110)	61 to 70	points	7	(seven)	(D)	
					71 to 80	points	8	(eight)	(C)	

				81 to 90 points	9 (nine)	(B)
				91 to 100 points	10 (ten)	(A)
41			oval and entrance to the ransition in the next year	60% active participation at the	e course	
42	2 Language of teaching / study			English		
43	Methods of measuring / monitoring the quality of teaching			Standardized motor tests, obs Self-evaluation	servation, survey	
	Literat	ure				
		Basic	literature			
	22.1	No	Author	Title	Publisher	Year
44		1.	BREY B	INTEL MICROPROCESSORS: Architecture, Programming, and Interfacing, 8th Ed	Pearson, Prentice Hall	2009
		2.	N.S.Kumar, M. Saravanan, S Jeevananthan	Microprocessors and Microcontrollers	Oxford University Press	2011
		3.	Douglas V. Hall	Microprocessors and Interfacing	Tata McGraw 200 Hill Publications Ltd., Revised Third Edition	
	22.2	Additio	onal literature			
		No	Author	Title	Publisher	Year
		1.	R. J. Tocci, F. J. Ambrossio	Microprocessors and Microcomputers: Hardware and Software, 6th Ed	Prentice Hall	2002
		2.				
		3.				

Anne	ex 3.	Program of the	course for First c	ycle	studies				
89.	Title of Cou	irse	ICT Project Mai	ICT Project Management					
90.	Code		2FI104021	2FI104021					
91.	Study program		Computer engin	Computer engineering and technologies					
92.	Organizer of the Study program		Faculty of Computer Science						
93.		second or third dies)	First	First					
94.	Academic y	/ear/ semester	Third year / Sixth semester	7.	Number of ECTS	6			
95.	Professor (s)	Asso. Prof. Alek	sand	ar Krstev PhD				
96.	Requireme the course	nts for enrolling	None						
97.	Aims of the	course (competer	ces):						

	estimate o interface v understand estimating	n the necess vith the gov ding on the	erning one's n erning one process ential influ	resources f e team. Th on organiz ence on th	ailed project plans, schedule or the project, allocation and one same as that everything cationally change, identifying the projects, how and overco	coordinati expects g on thos	ing on resource to develop s se concerned	kills for sides,
98.	 on the changes and the process on changes. Diagnosing and conceptualization on the changes. Dealing with challenges on the implementation, understanding and coping with resistance. Dealing with issues on motivation, interpersonal relationships, leadership in the process on changes; implications on international teams. Management of politics on the organization. Meeting with both most used methodologies for management with projects: PMBOK (Project Management Body of Knowledge) and PRINCE2 (Projects IN Controlled Environments 2). Lectures, laboratory exercises, numerically exercises, electronically learning, seminary work, project, teamwork, consultations. 							
99.								
100.	Total amount of available time: 6 ECTS x 30 hours = 180 hours							
101.	Distribution of available time: 30+30+30+60=180 hours (2+2+1)							
100	Forms of t	eaching /	15.1	teaching	/ theoretical - contact , e-teaching ks x 2 hours = 30 hours)	30 hou	rs	
102.		learning activities		e-exams independ	cal and practical exercises, , preparation of dent seminar work ks x 1 hours = 15 hours)	30 hours		
			16.1	Projects		30 hours		
103.	Other form activities	ns of	16.2	Individua	al work	30 hou	ſS	
			16.3	Home le	arning	60 hou	rs	
104.	Method of assessme	nt						
	17.1	Tests / Ora	al Exam		20+20+30 points			
105.	17.2	Individual practical)	work (pres	entation,	10 points			
	17.3	Activity an	d participa	tion	10+10 points			
		1			up to 50 points	5	(five)	(F)
					51 to 60 points	6	(six)	(E)
106.	Assessme	nt Criteria (scores/ po	ints)	61 to 70 points	7	(seven)	(D)
		· · · · · · · · · · · · · · · · · · ·			71 to 80 points	8	(eight)	(C)
					81 to 90 points	9	(nine)	(B)

				91 to 100 points	10 (ten)	(A)			
107.			roval and entrance to the transition in the next year	60% success from all pre-exams activities that is 42 points from both colloquia, the seminary, regularity on lectures and exercises					
108.	Langu	age of te	eaching / study	English					
109.	Methods of measuring / monitoring the quality of teaching			Self-evaluation					
	Literat	ure							
		Basic	literature	•					
		No	Author	Title	Publisher	Year			
110.	22.1	1.	Harold Kerzner	Project Management: A Systems Approach to Planning, Scheduling, and Controlling	J.Wiley&Sons	2009			
		2.	Esther Cameron, Mike Green	Making Sense of Change Management: A Complete Guide to the Models Tools and Techniques of Organizational Change	Kogan Page	2009			
		3.	A. Krstev, Z. Zdravev	Management on IT projects	UDG Stip	2019			
	22.2	Additi	onal literature						
		No	Author	Title	Publisher	Year			
		1.							
		2.							

Annex	k 3.	Program of the C	Course for First of	cycle	studies			
1.	Title of Course		Information Th	Information Theory				
2.	Code		2FI104121	2FI104121				
3.	Study program		Computer Engi	neeri	ng and Technologies			
4.	Organizer of the Study program		Goce Delchev University – Stip Faculty of Computer Sciences					
5.	Level (first, cycle of stu	second or third idies)	First cycle					
6.	Academic y	year/ semester	Fourth year / Sixth 7. Number of ECTS 6 semester					
7.	Professor (s)	Natasha Stojkovikj					
8.	Requireme the course	nts for enrolling	None					

9.	Students t		eoretical a	nd practic	al knowledge on basic concepts	s of inf	ormation the	eory,	
10	Introductic system. Informatic entropy. P informatio Asymptoti Differentia General a algorithm.	on measures roperties of n: Jensen's c Equipartiti I entropy. In spects of co Shannon's	ation Theo s: entropy, entropy. F inequality, on Propert formation ding. Fixed binary cod	ry. Determ informatic Relative en Log-sum y (AEP). Sources: I d-Length a e. Gilbert	semester): ninistic and probabilistic systems on, mutual information, conditior tropy. Chain Rules. Some inequinequality, Data processing ine Discrete, stationary, memoryles and Variable-Length Codes. Kra - Moore code. Shannon - Fano oder of communication channel	nal entr ualities quality s, Marl aft's ine code.	ropies, joint for entropy , Fano's inec kov, ergodic quality. Hut	quality.	
11		of learning: L ork with diff			and practical exercises, e-learn tions.	ing, tea	am projects,		
12					30 hours = 180 hours				
13	Distributio	n of availabl	le time: 30	+ 30 + 30	+ 30 + 60 = 180 hours (2 + 2 +	1)			
1/	4 Forms of teaching / learning activities 15.1 teaching / 15.1 teaching / 15.2 Theoreti exams, p 15.2 seminar			/ theoretical - contact , e-teaching ks x 2 hours = 30 hours)	30 hc	ours			
14				cal and practical exercises, e- preparation of independent work ks x 2 hours = 30 hours)	30 hours				
			16.1	Projects		30 hc	ours		
15	Other form activities	ns of	16.2	Individua	al work	30 hc	ours		
			16.3	Home lea	arning	60 hc	ours		
16	Method of assessme								
	17.1	Tests / Ora project	al Exam / 1	Feam	70 scores				
17	17.2	Individual practical)	work (pres	entation,	10 scores				
	17.3	Activity an	d participa	tion	20 scores				
					up to 50 points	5	(five)	(F)	
					51 to 60 points	6	(six)	(E)	
18	A	ent Criteria (s	oooroo/ po	into)	61 to 70 points	7	(seven)	(D)	
	Assessme	ini Chiena (i	scores/ po	1115)	71 to 80 points	8	(eight)	(C)	
					81 to 90 points	9	(nine)	(B)	
					91 to 100 points	10	(ten)	(A)	
19	final exam	approval an / or transitio			60% active participation at the course				
20	Language	of teaching	/ study		English				
21	Methods of t	of measuring eaching	g / monitori	ing the	Standardized motor tests, obs Self-evaluation	ervatio	on, survey		

	Literatu	ıre				
		Basic I	iterature			
		No	Author	Title	Publisher	Year
22	22.1	1. Stojkovikj,N, Miteva M, Utkovski Z, Karamazova E		Information theory UGD -Teaching material		2018
		2. Miteva M, Stojkovikj,N, Utkovski Z		Information theory -Teaching practicum	UGD	2018
		3.				
	22.2	Additic	onal literature			
		No	Author	Title	Publisher	Year
		1.	Thomas M. Cover, Joy A. Thomas	Elements of Information Theory	John Wiley & Sons	2006
		2.	Z. Pause	Introduction to information theory	Skolska knjiga, Zagreb	1980
		3.	David J.,C. MacKay	Information Theory, Inference, and Learning Algorithms	Cambridge University Press	2003

Append	dix 3.	Program of the C	Course for First c	ycle	studies		
1.	Title of C	ourse	Numerical Met	hods			
2.	Code		2FI104221				
3.	Study pro	ogram	Computer Eng	inee	ring and Technologies		
4.	Organize program	r of the Study	Goce Delchev Faculty of com				
5.	Level (firs	st, second or third studies)	First cycle				
6.	Academic	c year/ semester	3/6	7.	Number of ECTS	6	
1.	Professo	r (s)	Prof. Vlado Gicev				
2.	Requirem enrolling	nents for the course	none				
3.	Getting s solutions.	. The student ge	nathematical and ts competencies	s foi	gineering problems for w finding approximative n		
4.	 satisfactory accuracy for the considered problem. Contents of the course (per 15 weeks per semester): Introduction. Vector norms. Errors. Direct and indirect methods for solving system of linear algebraic equations. Numerical methods for solving nonlinear equations. Polynomial interpolation. Lagrange and Newton interpolation formulae. Method of least squares. Methods of approximative solutions of a definite integral – quadrature. Numerical methods for solving ordinary differential equations. 						
5.	Methods	of learning: lecture	es, excercises. ⊦	lome	work assignments, two m	ini projects.	

6.	Total area									
7.				e: 6 EKTS x 30 ł		urs				
	Distribut	ion of availa	able time:	Lectures /	theoretical,					
8.	Forms of	f teaching	15.1	contact teachin	g, e-learning	ng 30 nours				
	/ activities	learning	15.2	Exercises laboratory, seminars, team	(practical, theoretical, 30 hours work)					
			16.1	Projects			30 hours			
9.	Other f activities		16.2	Individual work			30 hours			
			16.3	Home learning			60 hours			
	Method assessm	of nent								
10.	17.1	Tests / Or	al Exam		70 scores					
	17.2	Individual projects, p		(presentation,	10 scores					
	17.3	Activity an		ation	20 scores					
					up to 50 points	5	(five)	(F)		
					51 to 60 points	6	(six)	(E)		
11.					61 to 70 points	7	(seven)	(D)		
	Assessm	nent Criteria	a (scores/	points)	71 to 80 points	8	(eight)	(C)		
					81 to 90 points	9	(nine)	(B)		
					91 to 100 points	10	(ten)	(A)		
12.	•	e approval r transition i		ance to the final t year	Gaining at least 42 out of 70 points from activities during the semester from which: 40 points from midterm exams, 10 points from project and 20 points from presence on lectures and discussions.					
13.	Languag	e of teachi	ng / study	,	English				510113.	
14.		of meas f teaching	uring /	monitoring the	Self evaluatio	n				
	Literatur	v								
		Bas	ic literatu	e	1					
		No	Autho	r	Title	Publisher			Year	
15.	22.1	1.	wu_C	<u>Y. Yang Wen</u> ao_Tae- _Chung_John_ S	Applied numerical methods using Matlab	John Wiley E – book: https://fmipa content/uplo on Y. Yang Tae- Sang_Chun BookZZ.org	a.umri.ac.id/ bads/2016/0 g_Wenwu_(ug_John_Mo	<u>)3/W</u> Cao	2005	
		2.	W.H. Teuko	Press, S.A. blsky, W.T.	Numerical recipes in Fortran 77	Cambridge	University F	Press	2003	

		Vetterling, B.P. Flannery			
	3.				
22.2	Additio	onal literature			
	No	Author	Title	Publisher	Year
	1.				

Append	dix 3.	Program	of the C	ourse for First c	ycle	studies			
1.	Title of C	ourse		Modern Comp	uter /	Architecture	es		
2.	Code			2FI103323					
3.	Study pro	ogram		Computer Eng	ineer	ing and Te	chnologi	es	
4.	Organize program	r of the	Study	Goce Delchev University – Stip Faculty of computer science					
5.	Level (firs	st, second studies)	or third	First cycle					
6.	Academic	Academic year/ semester Third / VI 7. Number of ECTS 6							6
1.	Professor (s) Ass. Professor Dusan Bikov								
2.	Requirem enrolling	nents the course	for e	None					
3.	Aims of the course (competences): The aim of the course is for students to become familiar with modern heterogeneous computer systems. Students will be able to design, maintain and program modern heterogeneous computer systems with modern processors and computer elements.								
4.	Contents of the course (per 15 weeks per semester): Modern microprocessors, POST RISC technology, superscalar and VLIW processors, GPUs, sequential and out-of-order processing, register renaming, branch prediction, instruction issuance,								
5.	Lectures,		al and p	ractical exercise					k / project; home study, s.
6.	Total amo	ount of ava	ailable ti	me: 6 ECTS x 3	0 hoi	urs = 180 h	ours		
7.	Distributio	on of avail	able time	e: 30+30+30+30)+60	= 180 hour	s (2+2+1)	
8.									
	activities		15.2	Exercises (theoretical, se			oratory, ork)	30 hc	
			16.1	Projects				30 hc	ours
9.	Other for activities	orms of	16.2	Individual wo	rk			30 hc	ours
			16.3	Home learnin	ng			60 ho	ours

	Method assessm	of							
10.	17.1	Tests / Oral	Exam	70 scores					
	17.2	Individual projects, pra	work (presentation, actical)	10 scores					
	17.3	Activity and	participation	20 scores					
				up to 50 points	5 (five)	(F)			
				51 to 60 points	6 (six)	(E)			
11.		aant Critaria ((access)	61 to 70 points	7 (seve	n) (D)			
	Assessi	neni Chiena (scores/ points)	71 to 80 points	8 (eight) (C)			
				81 to 90 points	9 (nine)	(B)			
				91 to 100 points	10 (ten)	(A)			
12.	U U		nd entrance to the final the next year	60% active participation at the course					
13.	Languag	ge of teaching	ı / study	English					
14.		of measur f teaching	ing / monitoring the	Self-evaluation					
	Literatur	e							
		Basic	literature						
		No	Author	Title	Publisher	Year			
15.		1.	Hennessy, Patterson	Computer Architecture	Morgan Kauffmn	2012			
13.	22.1	2.	John L. Hennessy, David A. Patterson	Computer Architecture: A Quantitative Approach	Morgan Kaufmann	2006			
		3.	Jerome Saltzer, M. Frans Kaashoek	Principles of Computer System Design: An Introduction	vstem Morgan				
	22.2	Additio	onal literature						
		No	Author	Title	Publisher	Year			
		1.							

Annex	c 3.	Program of the co	ourse for First cycle studies
45	45 Title of Course		Introduction to statistical analysis
46	Code		2FI103423
47	Study progr	am	Computer Engineering and Technologies
48	Organizer o program	f the Study	Goce Delchev University – Stip Faculty of Computer Science
49	Level (first, cycle of stu	second or third dies)	First cycle

50	Academic	year/ semes	ster	Third year Sixth seme		7.	Nur	mber of	ECTS		6	
51	Professor	(s)		prof. Limo	nka Ko	ceva	a Laz	zarova				
52	the course		-	None								
53	Students to Students	e course (co to become should be a software SP	familiar w ble to ap	ith the bas ply the acc								
54		e statistics; l e intervals. l							valuatio	n of par	ameters;	
55	Methods c consultatio	of learning: L ons.	ectures, tl	heoretical a	and pra	actica	al ex	ercises	, e-learn	ing, tea	mwork,	
56	Total amo	unt of availa	ble time: 6	6 ECTS x 3	80 hour	'S = ´	180 H	nours				
57	Distributio	n of availabl	e time: 30	+ 30 + 30	+ 30 +	60 =	= 18() hours	(2 + 2 +	1)		
	Forms of t	eaching /	Lectures teaching (15 wee	, e-tead	ching	g		s)	30 hc	ours		
58	learning a		15.2	Theoretical and practical exercises, e- exams, preparation of independent seminar work (15 weeks x 2 hours = 30 hours)				30 hc	30 hours			
			16.1	Projects						30 hc	ours	
59	Other form activities	ns of	16.2	Individual work				30 hc	ours			
			16.3	Home le	arning					60 hc	ours	
60	Method of assessme			·								
	17.1	Tests / Ora	al Exam		70 sc	ores	3					
61	17.2	Individual practical)	work (pres	sentation,	10 scores							
	17.3	Activity an	d participa	ation	20 sc	ores	3					
					up to	50 p	point	s		5	(five)	(F)
					51 to	60 p	point	S		6	(six)	(E)
		at Oritaria (/		61 to	70 p	point	S		7	(seven)	(D)
62	Assessme	nt Criteria (s	scores/ po	ints)	71 to	80 f	point	s		8	(eight)	(C)
					81 to	90 f	point	S		9	(nine)	(B)
			91 tc	o 100) poi	nts		10	(ten)	(A)		
63		approval an / or transitio			60%	activ	ve pa	articipat	ion at the	e course	e	
64		of teaching	un you	Engli	sh							
65	Methods of t	f measuring eaching	/ monitor	ing the	Standardized motor tests, observation, survey Self-evaluation							
	Literature	<u>y</u>										

	Basic I	iterature			
	No	Author	Title	Publisher	Year
22.1	1. R. Lyman Ott Michael Longnecker		An Introduction to Statistical Methods and Data Analysis Fifth Edition	Duxbury Thomson Learning	2001
	2.	Roxy Peck, Chris Olsen, Jay Devore	Introduction to Statistics and Data Analysis Third Edition	Thomson Brooks/Cole	2008
22.2	Additio	nal literature			
	No	Author	Title	Publisher	Year

Annex	k 3.	Program of the	Course for First o	cycle	studies				
1.	Title of Cou	urse	Computer Syst	tem	Security				
2.	Code		2FI104821	2FI104821					
3.	Study prog	ram	Computer Engir	neeri	ng and Technologies				
4.	Organizer o program	of the Study	Goce Delchev L Faculty of Com						
5.		second or third idies)	First cycle						
6.		year/ semester	Fourth year / Seventh7.Number of ECTS8semester8						
7.	Professor ((s)	Aleksandra Mile	eva					
8.	8. Requirements for enrolling the course None								
9.	Students to acquire theoretical and practical knowledge of the various aspects of computer								
10	 systems security. Contents of the course (per 15 weeks per semester): Introduction, Security goals and design principles, Malware; Intro in cryptography – classical cryptography, PRNGs, stream and block cipher, message authentication codes, hash functions, public key cryptography, digital signatures; Software security – unsafe programming languages and common implementation flows, buffer overflow, integer overflow, format string vulnerability etc. Protection; Identification, authentication, authorization, UNIX and Windows security; Web security – security issues with session management, web application security and attacks – SQL injection, XSS, CSRF, web-browser security; 								
11	 Network security and wireless network security, DoS and DDoS attacks. 11 Methods of learning: Lectures, theoretical and practical exercises, e-learning, team projects, practical work with different tools, consultations. 								

13	Distribu	ition of	availah	le time: 4	5 + 30 + 30) + 60 + 75 = 240 hours (3 + 2	+ 2)				
				15.1	Lectures teaching	/ theoretical - contact , e-teaching ks x 3 hours = 45 hours)	teaching				
14		of teach g activit		exams, p 15.2 seminar		cal and practical exercises, e- preparation of independent	30 hours				
	-			16.1	Projects		30 hours				
15	Other f			16.2	Individua	al work	60 hours				
	aouvia			16.3	Home le	arning	75 hours				
16	Methoo assess						1				
	17.1	Tes		al Exam /	Team	70 scores					
17	17.2	Ind	ject ividual ctical)	work (pre	sentation,	10 scores					
	17.3			d particip	ation	20 scores					
						up to 50 points	5 (five)	(F			
						51 to 60 points	6 (six)	(E			
18						61 to 70 points	7 (seven) ([
	Assess	ment C	riteria (scores/ po	oints)	71 to 80 points	8 (eight)	(0			
						81 to 90 points	9 (nine)	(E			
						91 to 100 points	10 (ten)	(4			
19				id entranc on in the n		60% active participation at the	ne course				
20	Langua	ige of te	aching	/ study		English					
21		ls of me of teach		g / monito	ring the	Standardized motor tests, ol Self-evaluation	oservation, surve	у			
	Literatu	ire									
ĺ		Basic	literatu	re							
22		No	Autho	or		Title	Publisher	Year			
<u>~</u> 2	22.1	1.	Pflee			Security in Computing, 4 th Edition	Prentice Hall	2006			
		2.	Ross	J. Anders	son	Security Engineering, 2 nd Edition	Wiley	2008			
		3.									
	22.2	Additio	onal lite	rature				1			
		No Author				Title	Publisher	Year			
		1.	Diete	r Golman		Computer Security	Wiley	2006			

2.	A. J. Menezes, P. C. Van Oorschot, S. A. Vanstone	Handbook of Applied Cryptography	CRC Press	1996
3.	N. Smart	Cryptography: An Introduction, 3 rd Edition	McGraw Hill	2004

Annex	c 3.	Program	of the (Course for Integ	grate	d Second cycle stu	udies		
1.	Title of Co	urse		Artificial Intell	igen	ce			
2.	Code			2FI104921					
3.	Study prog	jram		Computer Engineering and Technologies					
4.	Organizer program	of the Stuc	ly	Goce Delchev Computer Scie					
5.	Level (first cycle of stu		r third	First cycle					
6.	Academic	,	ester	Fourth year / VII semester	7.	Number of ECTS		8	
7.	Professor	(s)			Cveta	a Martinovska Bande	Э		
8.	Requirements the course		olling	None					
9.	Aims of the course (competences): This course teaches the fundamentals of Artificial Intelligence, such as knowledge representation, inference, machine learning, problem solving and searching that are used in computer vision, robotics, natural language processing and understanding.								
10	Contents of the course (per 15 weeks per semester): Overview of AI. Knowledge representation and inference with predicate and propositional logic. Programming language Prolog. State space searching: Breadth First Search, Depth First Search, Best First Search, Hill climbing, A* algorithm. Constraint satisfaction problems. Supervised learning, regression, gradient descent. Classification: Bayesian classifier, Decision trees. Support Vector Machines. Reinforcement learning, Markov Decision Processes. Robotics, motion planning. Geometric vision. Artificial neural networks, perceptron, Adaline, backpropagation algorithm. Modeling uncertainty, Bayesian networks, Fuzzy logic. Implementation of machine learning algorithms in Python.								
1.	Methods o Lectures, [hours.		s, Labs,	Practical exercis	es, e	-learning, individual	and te	am projects, office	
12	Total amou	unt of avail	able time	e: 8 ECTS x 30 h	ours	a = 2 40 hours			
1:	Distributior	n of availab	ole time:	45 + 30 + 30 + 6	0 + 7	75 = 240 hours (3 +	2+2)		
14	Forms of te	eaching /	15.1	Lectures / the teaching, e-le			45 ho	ours	
	learning ac		15.2	Exercises (pr	actic		30 ho	ours	
			16.1	Projects		·	30 ho	ours	
15	Other form activities	is of	16.2	Individual wor	ſk		60 ho	ours	
			16.3	Home learnin	g		75 ho	ours	
16	Method of assessmen	nt		-			-		
	17.1	Tests / Or	al Exam		7	0 scores			

17	17.2	Individual w projects, pra	ork (presentation, actical)	10 scores					
	17.3	Activity and	participation	20 scores					
				up to 50 points	5 (five)	(F)			
				51 to 60 points	6 (six)	(E)			
18				61 to 70 points	7 (seven)	(D)			
	Assessme	ent Criteria (s	cores/ points)	71 to 80 points	8 (eight)	(C)			
				81 to 90 points	9 (nine)	(B)			
				91 to 100 points	10 (ten)	(A)			
19		approval and transition in th	l entrance to the final ne next year	60% active participat	on at the course	Э			
20	Language	e of teaching /	study	English					
21	Methods of teachin		/ monitoring the quality	Standardized motor tests, observation, survey Self-evaluation					
	Literature								
		Basic	literature						
		No	Author	Title	Publisher	Year			
22	22.1	1.	Stuart Russell and Peter Norvig	Artificial Intelligence: A Modern Approach, 3 ed.	Prentice Hall (преводи од Влада на РМ)	2014			
		2.	Kevin Warwick	Artificial Intelligence, The basics	Routledge	2012			
		3.	Prateek Joshi	Artificial Intelligence with Python	Packt Publising	2017			
	22.2	Additi	onal literature						
		No	Author	Title	Publisher	Year			
		1.	Denis Rothman	Artificial Intelligence by Example	Packt Publising	2018			
		2.	Aurélien Géron	Hands-On Machine Learning with Scikit-Learn, Keras & TensorFlow	O'Reilly Media	2019			
		3.	Ivan Bratko	Prolog Programming for Artificial Intelligence	Addison- Wesley	2001			

Annex	Annex 3. Program of the Co		ourse for First cycle studies
1.	^{1.} Title of Course		Digital Signal Processing
2.	Code		2FI105021
3.	[.] Study program		Computer Engineering and Technologies

4.	Organizer program	of the Study	/	Goce Delo Faculty of							
5.		, second or udies)	third	First cycle							
6.		year/ seme	ster	Fourth yea Seventh semester	ar /	7.	Number	of ECTS		6	
7.	Professor	(s)		Natasha S	tojkov	/ikj					
8.	Requirements the course	ents for enro	olling	None	ne						
9.	Aims of the Students t	e course (co o acquire th of systems f	eoretical	and practic					signal p	processing	,
10	Contents of the course (per 15 weeks per semester): Basic concepts of signals and systems theory, discrete signals, digital signal processing. Concept of frequency in continuous time and discrete time signals. Fourier transform and frequency spectrum of analog signal. Fourier Series. Z-transform: definition, region of convergence, properties of Z-transform, inverse Z-transform. Frequency spectrum of a discrete signal. Cauchy's theorem. Introduction to discrete linear systems: Discrete time signal, Special sequences, Shift invariance, Stability and causality, Impulse response, Difference equations. Discretization of random signals, analog sgnal sampling and reconstruction. Discrete Fourier transform: Definition of DFT and relation to Z-transform. Properties of the DFT, Linear and periodic convolution using the DFT. Fast Fourier (FFT) transform. Digital filter design:Finite impulse response (FIR) filters (Window design techniques, Kaiser window design technique,Equiripple approximations Infinite impulse response (IIR) filters (Bilinear transform method).										
11		of learning: L ork with diff					al exercis	ses, e-learn	ing, tea	am project	S,
12		unt of availa		•			180 hour	S			
13	Distributio	n of availabl	e time: 3	0 + 30 + 30	+ 30	+ 60	= 180 ho	urs (2 + 2 +	1)		
14	Forms of t	oophing (15.1	teaching	, e-tea	achin	al - conta g rs = 30 hc		30 hours		
14	learning a	0	15.2	exams, p seminar	orepai work	ation	ctical exe of indepe rs = 30 hc		30 ho	ours	
4			16.1	Projects					30 ho	urs	
15	Other form activities	IS OF	16.2	Individua	al wor	<			30 ho		
16	Method of		16.3	Home le	arning)			60 ho	urs	
	assessme	nt			T						
	17.1	Tests / Ora project	al Exam /	Team	70 s	core	3				
17	17.2	Individual practical)	work (pre	sentation,	10 s	core	6				
	17.3	Activity an	d particip	ation	20 s	core	6				
18	Assassme	ent Criteria (s	scores/ n	nints)	up te	o 50	points		5	(five)	(F)
	7336331116		300163/ p	onnoj	51 te	o 60	points		6	(six)	(E)

				61 to 70 points	7	(seven)	(D)		
				71 to 80 points	8	(eight)	(C)		
				81 to 90 points	9	(nine)	(B)		
				91 to 100 points	10	(ten)	(A)		
19			oval and entrance to the ransition in the next year	60% active participation at the course					
20	Langu	age of te	eaching / study	English					
21		ds of me of teach	asuring / monitoring the iing	Standardized motor tests, obs Self-evaluation	servatio	n, survey			
	Literat	ure							
		Basic	literature	·					
		No Author		Title	Publis	her	Year		
22	22.1	1.	Bogdanov M., Bogdanova S.	Digital signal processing	ETF S	skopje	1998		
		2. John G. Proakis, Dimitris G. Manolakis		Digital Signal Processing, Principles, Algorithms and Apllications , 4 th Edition	Prenti	ce Hall	2006		
		3.							
	22.2	Additio	onal literature						
		No	Author	Title	Publis	her	Year		
		1.	Lizhe Tan, Jean Jiang	Digital Signal Processing, Principles,3 rd Edition	Acade Press	emic	2018		
		2.	John G. Proakis Vinay K. Ingle	Digital Signal Processing Using MATLAB	CL Engin	2011			
		3.							

Anne	x 3.	Program of the C	ourse for First c	/cle s	tudies		
1.	Title of Course	Javascript-base	Javascript-based technologies				
2.	Code		2FI133921				
3.	Study progran	n	Computer engine	eering	g and technologies		
4.	Organizer of t	Goce Delchev University – Stip Faculty of informatics					
5.	 Level (first, se of studies) 	cond or third cycle	First cycle				
6.	Academic yea	nr/ semester	4 year / VII semester	7.	Number of ECTS	4	
7.	Professor (s)		Prof. Sasho Koceski				
8.	Requirements course	for enrolling the	None				
9.	Aims of the co	ourse (competences)):				

				students to the basic p server-side programm	rinciples and characteris ing.	tics of Ja	vaScipt based	ł
10	This course peculiarities Programmir	covers the t and mechang with Java	following inism on Script.		aScript. JavaScript object ous JavaScirpt technolog			ntics,
1.	Methods of	learning:					oto office her	
1:				4 ECTS x 30 hours = 1	earning, individual and te 20 hours	am proje	cis, onice not	115
1:					120 hours (2 + 1 + 1)			
14			15.1		etical, contact teaching,	30 hou	rs	
	learning activities		15.2	Exercises (pract	ical, laboratory, inars, team work)	15 hou	rs	
			16.1	Projects		30 hou	rs	
15		s of	16.2	Individual work		30 hou	rs	
	activities 16.2 H			Home learning		15 hou	rs	
16	Method of a	assessment				I		
	17.1	Tests / Ora	al Exam					70 points
17	17.2	Individual v practical)	work (pre	esentation, projects,				10 points
	17.3	Activity and	d particip	pation				20 points
		1			up to 50 points	5	(five)	(F)
					51 to 60 points	6	(six)	(E)
18		t Oritoria (a a		:	61 to 70 points	7	(seven)	(D)
	Assessmen	t Criteria (so	ores/ po	ints)	71 to 80 points	8	(eight)	(C)
					81 to 90 points	9	(nine)	(B)
					91 to 100 points	10	(ten)	(A)
19		pproval and the next yea		e to the final exam/ or	60% active participatio	n at the c	course	
20		of teaching /			English			
2'	Methods of teaching	measuring /	monitor	ing the quality of	Standardized tests, ob Self-evaluation	servation	, survey	
	Literature							
		Ba	sic litera	ture				
22	No Author			thor	Title	Publish		Year
	22.1	1.	De	eitel, P	JavaScript for Programmers	Prentic	e Hall	2009
		2.	He	erron, D.	Node.js Web Development - Third Edition	Packt p	publishing	2016

	3.	Marijn Haverbeke	Eloquent JavaScript, 3rd Edition: A Modern Introduction to Programming	No Starch Press; 3r edition	d 2018
22.2	Additior	nal literature			
	No	Author	Title	Publisher	Year
	1.				
	2.				
	3.				

Anne	x 3.	Progra	m of the	e Course for	First	cycle studies		
1	Title of Cou	rse	I	Basics of rob	otics	;		
2	Code		:	2FI134021				
3	Study progr	am	(Computer eng	jineer	ing and technolog	jies	
4	Organizer of the Study program			Goce Delchev Faculty of info				
5	Level (first, third cycle o			First cycle				
6	· · · · ·		4	4 year / VII semester	7.	Number of ECT	S	4
7	Professor (s	3)	1	Prof. Sasho K	ocesł	k i		
8	Requirement enrolling the		1	None				
9	Aims of the course (competences): This course aims to introduce students to the basic concepts of robotics and with the basic types and							
1		telligent	agents a			er types of propuls Application of rot		ement and control of robotic s
4				, Numerical e	xercis	ses, e-learning, inc	dividual and	team projects, office hours
1	Total amour	nt of ava	ilable tin	ne: 4 ECTS x	30 hc	ours = 120 hours		
1	Distribution	of availa	ble time	: 30 + 15 + 30) + 30) + 15 = 120 hours	s (2 + 1 + 1)	
1	Forms of tea	achina	15.1	teaching, e-	-learn		30 hours	
	/ learning ac		15.2	Exercises (theoretical, work)		cal, laboratory, nars, team	15 hours	

			16.1	Projects		30 hours			
1	Other for activities		16.2	Individual wor	k	30 hours			
			16.3	Home learning	9	15 hours			
1	Method o assessm								
	17.1	Tests / Ora	al Exam					70 po	
1	17.2	Individual v projects, p		resentation,				10 po	
	17.3	Activity and						20 po	
					up to 50 points	5	(five)	(F	
					51 to 60 points	6	(six)	(E	
1		nent Criteria (scores/ points)			61 to 70 points	7	(seven)	(D	
	Assessmer	ient Criteria	(scores	/ points)	71 to 80 points	8	(eight)	(C	
					81 to 90 points	9	(nine)	(B	
					91 to 100 points	10	(ten)	(A	
1		e approval a m/ or transiti			60% active particip	bation at the co	ourse		
2	Languag	e of teaching	g / stud	y	English				
2		of measurin	g / mor	nitoring the	Standardized tests, observation, survey Self-evaluation				
	Literature	f teaching			Self-evaluation				
	Literature		sic litera	ature					
		No	Auth		Title	Publisher		Year	
2		1.		Џ.Крег	Вовед во роботика – механика и контрола	МИО-прево, од Влада на		2011	
	22.1		Cef			Maaaabuaa	440		
		2.	Вол	астијан Трун, фрам Бургард ітер Фокс	Веројатносна роботика	Massachuse Institute of Technologyr Влада на Pl	реводи од	2006	
		2. 3.	Вол и Ди	фрам Бургард	роботика The robotic	Institute of	реводи од	2006	
	22.2	3.	Вол и Ди Маја	фрам Бургард тер Фокс	роботика	Institute of Technologyr Влада на Pl	реводи од		
	22.2	3.	Вол и Ди Маја	фрам Бургард птер Фокс a Mataric literature	роботика The robotic	Institute of Technologyr Влада на Pl	реводи од		
	22.2	3. Add	Вол и Ді Maja ditional Auth	фрам Бургард птер Фокс a Mataric literature	роботика The robotic primer	Institute of Technologyr Влада на Pl MIT Press	іреводи од М	2007	

3.	Frank Chongwoo Park and Kevin M. Lynch	Modern Robotics	Cambridge University Press	2017	
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Anne	x 3.	Program	of the co	ourse for First cy	/cle :	studies		
111.	Title of Cou	ırse		Software Testir	ng an	d Analysis		
112.	Code			2FI134121				
113.	Study prog	ram		Computer engineering and technologies				
114.	Organizer of the Study program			Faculty of Comp	outer	Science		
115.	Level (first, cycle of stu		third	First				-
116.	Academic y	/ear/ seme	ster	Fourth/ seventh	7.	Number of ECTS	5	4
117.	Professor (s)		Asso. Prof. Alek	sand	ar Krstev PhD		
118.	Requireme the course	nts for enro	olling	None				
119.	Aims of the course (competences): This course is for the students with one from the most important phases in the process on development on software that is the design on his architecture. At the same time through practical examples the students will everything acquired with applicative knowledge for documentation on architecture, hers modeling with CASE tools and with the basic one's templates and frames on software architectures. Crafting on basic components of desktop, web, and mobile applications.							
120.	Content on the subject program: Introduction in software architectures. Planning and documenting on the software one's architectures. Basic types on software architectures - object-oriented architectures, architectures based on events. Basic types on software architectures - hierarchically and architectures who they share data. Basic types on software architectures - service oriented architectures. Basic types on software architectures - architectures who they use interlayers. Basic templates for creation on object – oriented software architectures. Behavioral templates and templates based on collections. Structural templates. Competitive templates. Language for formal analysis and design on the software one's architectures (Architecture Analysis and Design Language– AADL). CASE tools for modeling and design on software architectures, types, and species on testing on software							
121.						Itations; making on ing for exams and		ndent seminary ms; consultations
122.	Total amou	int of availa	ble time:	4 ECTS x 30 hou	rs =	120 hours		
123.	Distribution	of availabl	e time: 30)+15+30+30+15 =	= 120	hours (2+1+1)		
101	Forms of te	eaching /	15.1	Lectures / theo teaching, e-tea (15 weeks x 2	achin		30 hours	3
124.	learning activities		15.2	e-exams, prep independent s	arati emin		15 hours	3
			16.1	Projects			30 hours	3
125.	Other formativities	s of	16.2	Individual worl	<		30 hours	3
			16.3	Home learning	ļ		15 hours	
126.	Method of assessmen	nt						

	17.1	Те	sts / Oral Exam	20+20+30 points			
127.	17.2		lividual work (presentation, actical)	10 points			
	17.3	Ac	tivity and participation	10+10 points			
		•		up to 50 points	5	(five)	(F)
				51 to 60 points	6	(six)	(E)
400				61 to 70 points	7	(seven)	(D)
128.	Assess	sment C	riteria (scores/ points)	71 to 80 points	8	(eight)	(C)
				81 to 90 points	9	(nine)	(B)
				91 to 100 points	10	(ten)	(A)
129.			roval and entrance to the transition in the next year	60% success from all pre-e points from both colloquia, lectures and exercises			
130.	Langu	age of te	eaching / study	English			
131.		ds of me of teacl	easuring / monitoring the ning	Self-evaluation			
	Literat		<u> </u>				
		Basic	literature				
		No	Author	Title	Publisher		Year
	22.1	1.	Ian Gorton	Essential Software Architecture (2nd Edition)	Springer Berlin He	-Verlag eidelberg	2011
132.		2.	Zheng Qin, Jiankuan Xing, Xiang Zheng	Software Architecture	Springer		2008
		3.	Paul Clements, Felix Bachmann, Len Bass, David Garlan, James Ivers, Reed Little, Paulo Merson, Robert North, Judith Stafford	Documenting Software Architectures Views and Beyond (2nd Edition)		· Wesley	2010
	22.2	Additi	onal literature				
		No	Author	Title	Publishe	er	Year
		1.	Partha Kuchana	Software Architecture Design Patterns in Java	CRC Pre	ess LLC	2004
		2.					

Append	Appendix 3. Program of the C		Course for First cycle studies				
1.	Title of Course		Data Storage and Management				
2.	Code		2FI134221				
3.	Study program		Computer Engineering and Technologies				
4.	Organizer of the Study program		Goce Delchev University – Stip Faculty of computer science				
5.	Level (first, second or third cycle of studies)		First cycle				

6.	Academic year/ sem	nester	2023 / 7	7.	Number of ECTS		4				
1.	Professor		Associate Prof	essoi	r. Done Stojanov						
2.	Requirements enrolling the course	for	/								
3.	Aims of the course (The course prov	compete vides ir ion. Upo	nsights upon n successful co	mple	tion of the course,		storage architecture ts will be able to design,				
	Contents of the cour - Architecture			emes	ster):						
	- Data storag	e enviro	nment								
	- CPU, memo	ory, bus,	HDD, file syste	ms							
	 HDD components Software RAID 										
	- Hardware R	AID									
	- Raid levels										
4.	- Direct attached storage										
	- Optic cable technology										
	- Storage Area Network										
	- Network attached storage										
	- CIFS and NFS protocols										
	- Backup and recovery										
	- Data replica	- Data replication									
	- Storage virtualization										
5.	Methods of learning	: Lecture	es, practice in la	bora	tory, home learning						
6.	Total amount of ava	ilable tin	ne: 4 ECTS x 30) h =	120 h						
7.	Distribution of availa	able time	: 30+30+15+15	+30=	120 h (2+1+1)						
8.	Forms of teaching / learning	15.1	Lectures / teaching, e-le			30					
	activities	15.2			tical, laboratory, ars, teamwork)	30					
		16.1	Projects		,	15					
9.	Other forms of activities	16.2	Individual wo	rk		15					
		16.3	Home learnin	g		30					

[Method assessm	nent	of							
10.	17.1	Test	s / Oral	Exam		70 s	scores			
	17.2		ridual ects, pra	work ctical)	(presentation,	10 :	scores			
	17.3	Activ	vity and	participa	ation	20 క	scores			
						up t	o 50 points	5	(five)	(F)
						51 t	o 60 points	6	(six)	(E)
11.	Assessn	oont (ritoria (scores/	pointe)	61 t	o 70 points	7	(seven)	(D)
	A3562501		niena (500165/	points)	71 t	o 80 points	8	(eight)	(C)
					81 t	o 90 points	9	(nine)	(B)	
					91	to 100 points	10	(ten)	(A)	
12.	Signatur exam/ or				nce to the final year	/		-		
13.	Languag	ge of to	eaching	/ study		Eng	llish			
14.	Methods quality o			ing / r	monitoring the	Self	-evaluation			
	Literatur	е								
			Basic	literature	e					
			No	Author	uthor		;	Publi	sher	Year
15.	22.1		1.	Toigo,	bigo, J.W.		holy grail of storage nagement.	Prentice- Hall, Inc.		1999
			2.							
			3.							
	22.2		Additic	onal liter	ature					
			No	Author		Title	9	Publi	sher	Year
			1.							
Append	ix 3.		Progran	n of the	Course for First	cycle	studies	-		
1.	Title o	f Cou	rse		Introduction t	o Da	a Science			
2.	Code				2FI105621					
3.	Study	progra	am		Computer Eng	ineer	ing and Technolo	gies		
4.	Organ progra		of the	Study	Goce Delchev Faculty of com					
5.	Level	(first	, seco		First cycle					
6.		•	ear/ sen		Fourth / eighth	7.	Number of ECT	S	4	
1.	Profes	sor (s	5)			7. Number of ECTS 4 Aleksandar Velinov				

2.	Requirements enrolling the course	for										
3.	Aims of the course This course introduc tool for solving busin	(competer ces studer ness challe	nts to the field of enges. The cour		e cycle of data analytics as a ation for basic and advanced ologies and tools.							
	Contents of the cou - Introduction			nester):								
	- Data, Datab	bases and SQL										
	- Big Data											
	- MapReduce	Э										
	- Big Data Ar	nalytics										
	- Techniques	- Techniques for Data Analysis										
	- Getting Insi	ghts from	Data									
4.	- Data Qualit	- Data Quality and Preprocessing										
	- Clustering											
	- Classificatio	on										
	- Predictive N	Nethods										
	- Popular Da	ta Analytic	s Applications									
	- Python Pro	gramming	Language									
	- Machine Le	arning for	Data Science									
	- Data Collec	tion, Expe	rimentation and	Evaluation								
5.	Methods of learnin consultations.	g: Lecture	s, laboratory ex	kercises, e-learning,	seminar work, team work,							
6.	Total amount of ava	ailable time	e: 4 ECTS x 30 l	nours = 120 hours								
7.	Distribution of availa	able time:	30+15+30+30+	15 = 120 hours (2+1-	+1)							
8.	Forms of teaching	15.1	teaching, e-lea		30							
	/ learning activities	15.2		actical, laboratory, minars, teamwork)	15							
9.	Other forms of	16.1	Projects		30							
э.	activities	16.2	Individual worl		30							
	Method of	16.3	Home learning)	15							
10.	assessment			70 000100								
	17.1 Tests / Oral Exam 70 scores											

	17.2	Individual projects, prac	work (presentation, ctical)	10 scores				
	17.3	Activity and p		20 scores				
				up to 50 points	5 (five)	(F)		
				51 to 60 points	6 (six)	(E)		
11.	A			61 to 70 points	7 (seven)	(D)		
	Assess	ment Criteria (scores/ points)	71 to 80 points	8 (eight)	(C)		
				81 to 90 points	9 (nine)	(B)		
				91 to 100 points	10 (ten)	(A)		
12.		re approval ar or transition in t	id entrance to the final the next year	60% success from points from the tw paper, attendance	o colloquiums, t	he seminar		
13.	Langua	ge of teaching	/ study	English				
14.		s of measuri of teaching	ing / monitoring the	Self-evaluation				
	Literatu	re						
		Basic	literature					
		No	Author	Title Publisher		Year		
15.		1.	Chirag Shah	A Hands-On Introduction to Data Science	Cambridge University Pres	s 2020		
	22.1	2.	João Moreira, Andre Carvalho, Tomás Horvath	A General Introduction to Data Analytics	John Wiley Sons	& 2019		
		3.	Joel Grus	Data Science from Scratch: O'P/		^{a,} 2015		
	22.2	Additi	onal literature					
		No	Author	Title	Publisher	Year		
		1.	Francesco Corea	An Introduction to Data: Everything You Need to Know About AI, Big Data and Data Science	Springer	2019		
		2.	John D. Kelleher, Brendan Tierney	Data Science	MIT Press	2018		

Appendix	Appendix 3. Program of the C		Course for First cycle studies
1.	1. Title of Course		Distributed Computer Systems
2.	Code		2FI104421
3.	3. Study program		Computer Engineering and Technologies

4.	Organizer of the Study program	Goce Delchev Faculty of com								
5.	Level (first, second or third cycle of studies)	First cycle								
6.	Academic year/ semester	2023 / 8	7.	Number of ECTS	4					
1.	Professor	Associate Profe	Associate Professor. Done Stojanov							
2.	Requirements for enrolling the course	/								
3.		ation of distribute completion of t	he co	ourse, students will be able	e to understand the					
4.	objectives. Upon successful completion of the course, students will be able to understand the paradigm behind distributed systems and implement socket-based application for real-time communication. Contents of the course (per 15 weeks per semester): - Client/server model - OSI model - TCP/IP - TCP-based communication - UDP-based communication - Inter process communication - Remote procedure call - Client/Server failure in RPC									
5.	Methods of learning: Lecture	s, practice in lab	orato	ry, home learning						
6.	Total amount of available tim	e: 4 ECTS x 30	h = 1:	20 h						
7.	Distribution of available time	30+30+15+15+	30=1	20 h (2+1+1)						

8.		of teaching /	15.1	teaching, e-lear		30			
	learning	activities	15.2		actical, laboratory, ninars, teamwork)	30			
			16.1	Projects		15			
9.	Other activities	forms of	16.2	Individual work		15			
			16.3	Home learning		30			
	Method assessn	of nent							
10.	17.1	Tests / Ora	l Exam		70 scores				
	17.2	Individual projects, pr	work actical)	(presentation,	10 scores				
	17.3	Activity and		on	20 scores				
		•			up to 50 points	5 (five)		(F)	
					51 to 60 points	6 (six)		(E)	
11.	•				61 to 70 points	7 (seven)		(D)	
	Assessr	ment Criteria	(scores/ po	Dints)	71 to 80 points	8 (eight)		(C)	
					81 to 90 points	9 (nine)		(B)	
					91 to 100 points	10 (ten)		(A)	
12.		re approval r transition ir		nce to the final	/				
13.		ge of teachin			English				
14.	Methods of teach		ng / monito	oring the quality	Self-evaluation				
	Literatur	- V							
		Bas	sic literature	Э					
		No	Author		Title	Publisher		Year	
15.	22.1	1.	Varela	, C.A.	Programming Distributed Computing Systems: A Foundational Approach.	MIT Press.		2013.	
		2.	Rieker Weima		Adventures in UNIX Network Applications Programming.	John Wiley Sons, Inc.	&	1992.	
		3.							
	22.2	Ado	ditional liter	ature					
			-						
		No	Author		Title	Publisher	Y	ear	

Appendix	3.	Program of the	Course for First	cycle	studies					
1.	Title of Cou	urse	Cloud Infrastr	uctu	re and Services					
2.	Code		2FI105721							
3.	Study prog	jram	Computer Eng	ineer	ing and Technologies					
4.	Organizer program	of the Study		Goce Delchev University – Stip Faculty of computer science						
5.		, second or third udies)	First cycle							
6.		year/ semester	Fourth / 7. Number of ECTS 4							
1.	Professor ((s)	Ass. Prof. Dr. A	leks	andar Velinov					
2.	Requireme the course	ents for enrolling								
 Aims of the course (competences): The aim of the course is for students to become familiar with the concept and way of functioning of cloud systems and cloud infrastructure 										
4.										
5. 6.	consultatio	ons.	-		rcises, e-learning, semina	ar work, team work,				
	Total amou	unt of available ti	me: 4 ECTS x 30) hou	rs = 120 hours					
7.	Distributior	n of available time	e: 30+20+20+20	+30 =	= 120 hours (2+1+1)					

8.	Forms of	of teaching	15.1	Lectures / teaching, e-le	theoretical, contact arning	30 h	ours		
	/ learnin	g activities	15.2		ractical, laboratory, eminars, teamwork)	20 h	ours		
	[16.1	Projects		20 hours			
9.	Other activities	forms of	16.2	Individual wor	·k	20 h	ours		
	aouvilio	5	16.3	Home learnin	g	30 nours 20 hours 20 hours 20 hours 30 hours 5 (five) 6 (six) 7 (seven) 8 (eight) 9 (nine) s 10 (ten) rom all pre-exam at leage Publisher ng Ltd. es, John Wiley Sons ng: ind BPB Publication ind Publisher "O'Reilly Media Inc."			
	Method assessr	-		-					
10.	17.1	Tests / Ora	al Exam		70 scores				
10.	17.2	Individual projects, p	work ractical)	(presentation,	10 scores				
	17.3		d participat	ion	20 scores				
					up to 50 points	5	(five)		(F)
l					51 to 60 points	6	(six)		(E)
11.	11.		, ,		61 to 70 points	7	(seven)		(D)
	Assessme	ment Criteria	a (scores/ p	oints)	71 to 80 points	8	(eight)		(C)
					81 to 90 points	9	(nine)		(B)
					91 to 100 points	10	(ten)		(A)
12.		re approval or transition i		ice to the final year	minimum 42 points	from th	ne two collo	quiu	ums, the
13.	Langua	ge of teachi	ng / study		English				
14.		s of meas	uring / m	nonitoring the	Self-evaluation				
	Literatu								
		Bas	sic literature	Э					
		No	Author		Title	Publ	isher		Year
		1.	M.N. R	ao	Cloud Computing		Learning Pv	⁄t.	2015
15.	22.1	2.	Nelson Fonseo Boutab	ca, Raouf	Cloud Services, Networking, and Management	John Wiley & ,		2015	
	22.1	3.	Kamal Ruchi Temita	Kant Hiran, Doshi,	Cloud Computing: Master the Concepts, Architecture and Applications with Real-world examples and Case studies	BPB Publications 2		2019	
	22.2	Ade	ditional liter	ature		1		1	
		No	Author		Title	Publ	isher	Ye	ear
		1.	Justin Nova	Garrison, Kris	Cloud Native Infrastructure: Patterns for			20)17

		Scalable Infrastructure and Applications in a Dynamic Environment		
2.	Bento, Al	Cloud Computing Service and Deployment Models: Layers and Management: Layers and Management	IGI Global	2012

Anne	x 3.	Progra	m of the	e Course for Fir	st cy	cle studies					
1.	Title of Cour	se		Mobile Applica	ation	s Development					
2.	Code			2FI135321	2FI135321						
3.	Study progra	am		Computer engi	neerir	ng and technologie	S				
4.	Organizer of program	the Stud	dy	Goce Delchev Faculty of infor							
5.			r third	First cycle							
6.	Academic ye		ester	4 year / VIII semester	7.	Number of ECTS		4			
7.	Professor (s)		Prof. Sasho Ko	ceski						
8.	Requiremen the course	ts for eni	olling	None							
9.	 Aims of the course (competences): 9. The aim of the course is to introduce the students with the basic principles for mobile application development. It also aims to equip students with the necessary skills for designing and developing mobile applications using contemporary integrated development environments. 										
11	Contents of the course (per 15 weeks per semester): This course covers the following topics: Introduction to mobile applications, Challenges for mobile										
1	Methods of I	earning:				e-learning, individ	ual and tea	am projects, office			
1:	Total amoun	nt of avail	able tim	e: 4 ECTS x 30 I	nours	= 120 hours					
1:	Distribution	of availat	ole time:	30 + 15 + 30 + 3	30 + 1	5 = 120 hours (2 +	- 1 + 1)				
1.	Forms of tea	achina /	15.1	Lectures / th teaching, e-l		,	30 hours	3			
	learning acti		15.2	Exercises (p	ractic	al, laboratory, ars, team work)	15 hours	3			
			16.1	Projects			30 hours	3			
1	Other forms activities	of	16.2	Individual wo	ork		30 hours	3			
			16.3	Home learni	ng		15 hours	3			

1	Method of assessm										
	17.1	Tests / Ora	l Exam				70 points				
1	17.2	Individual v projects, pr	vork (presentation, actical)				10 points				
	17.3	Activity and	I participation				20 points				
				up to 50 points	5	(five)	(F)				
				51 to 60 points	6 (six)		(E)				
18	_		/ · · · · · · · · · · · · · · · · · · ·	61 to 70 points	7 (:	seven)	(D)				
	Assessment	nent Criteria (s	scores/ points)	71 to 80 points	8 ((eight)	(C)				
				81 to 90 points	9	(nine)	(B)				
				91 to 100 points	10	(A)					
1:		e approval an transition in t	d entrance to the final he next year	60% active participa	tion at the cou	irse					
2	Languag	e of teaching	/ study	English							
2	Methods of teachi		/ monitoring the quality	Standardized tests, observation, survey Self-evaluation							
	Literatur	е									
		Bas	ic literature								
		No	Author	Title	Publisher		Year				
2:	22.1	1.	Tommi Mikkonen	Programming Mobile Devices: An Introduction for Practitioners	Mobile Devices: AnSons Inc.Introduction for PractitionersHead First Android Development: A Brain-FriendlyShroff/O'Reilly; Second edition		2007				
	22.1	2.	Dawn Griffiths David Griffiths	Head First Android Development: A			2017				
		3.	John Horton	Android Programming for Beginners (2nd edition)	Packt Publishing		2018				
	22.2	Add	itional literature								
		No	Author	Title	Publisher		Year				
		1.	lan Darwin	Android Cookbook: Problems and Solutions for Android Developers	Oreilly & Associates Ir	าด	2017				
		2.									
		3.									

Annex 3. Program			of the course for First cycle studies						
67	Title of Cou	urse		Embeddeo	d Comp	oute	er Systems		
68	Code			2FI135221					
69	Study prog	ram		Computer	Engine	erin	g and Technologies		
70	program	-		Goce Delc Faculty of					
71	Level (first, cycle of stu			First cycle					
72	Academic	year/ semes	ster	Fourth yea Eighth semester		7.	Number of ECTS		4
73	Professor (s)		Aleksandra	a Stojar	างง	a Ilievska		
74	Requireme the course		-	None					
75	Aims of the course (competences): 75 The aim of this course is to enable students develop theoretical and practical knowledge about embedded systems hardware as well as acquire skills in programming embedded processors.								
76	 Contents of the course (per 15 weeks per semester): Microprocessors and microcontrollers. Introduction to microcomputers and embedded systems. Processor architectures, microcontrollers used in embedded systems (The CPU, memory and input output units, Interrupts) Architecture of Microprocessors and Microcontrollers. Comparison of different types of processors for embedded systems: microcontrollers, GPUs, heterogeneous SoCs. FPGA based processors. Introduction to hardware level programming of embedded systems (Programming in assembler, Programmering in C, Development platforms for embedded software) Parallel I/O. Asynchronous and synchronous serial communication. Interrupts and timing. Conversion of analog and digital signals. Control, sensors and actuators. Techniques for working with low consumption. Networking and mobility of embedded systems – a step towards the Internet of Things (IoT). Advanced Serial Communication and Memory Protocols for Embedded Systems. Programming languages and embedded systems programming. Integrated development environments for programming microcontrollers. Adruino, Keil uVision5, etc. 								
77			ectures, tł	neoretical a	and prac	ctica	al exercises, e-learn	ing, tear	m work,
78	Total amou	int of availa	ble time: 4	ECTS x 3	0 hours	s = '	120 hours		
79	Distributior	of availabl	e time: 30	+ 15 + 30	+ 30 + 1	15 =	= 120 hours (2 + 1 +	1)	
80	Forms of te		15.1	teaching, (15 wee	, e-teac <mark>ks x 2 h</mark>	hin houi	s = 30 hours)	30 ho	
00	learning activities		15.2	Theoretical and practical exercises, e- exams, preparation of independent seminar work (15 weeks x 1 hours = 15 hours)				15 ho	ours
			16.1	Projects				30 ho	ours
81	Other forms of activities		16.2	Individua	l work			30 ho	ours
			16.3	Home lea	arning			15 ho	ours
82	Method of assessmer	nt							
83		Tests / Ora	al Exam		70 sco	ores	;		

	17.2		lividual work (presentation, actical)	10 scores					
	17.3	Ac	tivity and participation	20 scores					
				up to 50 points	5	(five)	(F)		
				51 to 60 points	6	(six)	(E)		
				61 to 70 points	7	(seven)	(D)		
84	Assess	sment C	riteria (scores/ points)	71 to 80 points	8	(eight)	(C)		
				81 to 90 points	9	(nine)	(B)		
				91 to 100 points	10	(ten)	(A)		
85	Signat	ure appi (am/ or t	roval and entrance to the transition in the next year	60% active participation at the course					
86	Langua	age of te	eaching / study	English					
87		ds of me of teacl	easuring / monitoring the ning	Standardized motor tests, observation, survey Self-evaluation					
	Literat	ure							
		Basic	literature						
0.0		No	Author	Title	Publi	sher	Year		
88	22.1	1. Ed Lipiansky		Embedded Systems Hardware for Software Engineers	McG	raw-Hill	2012		
		2.	Peter Marwedel -	Embedded System Design IV edition	Sprin	ger	2021		
	22.2 Additional literature								
		No	Author	Title	Publi	sher	Year		
		1.	John Catsoulis	Designing Embedded Hardware: Create New Computers and Devices	O'Re	illy	2005		

Annex 3. Program of the Co			ourse for First cycle studies					
1.	Title of Course		Human-Computer Interaction					
2.	Code		2FI135421					
3.	Study progr	ram	Computer engineering and technologies					
4.	Organizer o program	of the Study	Goce Delchev University – Stip Faculty of informatics					
5.	Level (first, cycle of stu	second or third dies)	First cycle					
6.	Academic y	/ear/ semester	4 year / VIII semester	7.	Number of ECTS	4		
7.	Professor (s)	Prof. Natasha Koceska					
8.	Requirement the course	nts for enrolling	None					

9.	Aims of the course (competences): Fundamentals of human-computer interaction will be studied. The elements of system interaction (human with his perception, audio, tactile channels), the computer (with its input-output devices), and the various types of interaction will also be analysed. Usability: definition, purpose, principles; usability testing. The course will provide the students with practical skills for designing, evaluation and implementation of user interfaces using a variety of interactive technologies.								
10	 Contents of the course (per 15 weeks per semester): This course covers the following topics: An introduction of human-computer interaction Elements of the system interaction, types of interaction Human interactive model Computer as part of the interaction Types of interaction - command languages, window-oriented interaction, interaction based on voice commands, interaction based on gestures Interactive design HCI laws and rules for user interface design Usability definition, purpose and main principles Evaluation of user interfaces 								
11	Methods of learning: Lectures, Discussions, Labs, Numerical exercises, e-learning, individual and team projects, office hours								
12	Total amo	unt of availa	ble time: 4	4 ECTS x 30 hours	s = 120 hours				
13	Distribution	n of availabl	e time: 30	+ 15 + 30 + 30 +	15 = 120 hours (2 + 1 +	1)			
14	Forms of t		15.1	Lectures / theoretectures / theoretectur	ning	30 hours 15 hours			
	learning activities		15.2		Exercises (practical, laboratory, theoretical, seminars, team work)				
			16.1	Projects		30 ho	ours		
15	Other form activities	ns of	16.2	Individual work		30 ho	ours		
			16.3	Home learning		15 ho	ours		
16	Method of assessme								
	17.1	Tests / Ora	al Exam				70	points	
17	17 17.2 Individual work (presentation, projects, practical)			sentation,	10 points				
	17.3	Activity an	d participa	ation			ا 20	points	
					up to 50 points	5	(five)	(F)	
18	Assessme	nt Criteria (scores/ po	ints)	51 to 60 points	6	(six)	(E)	
					61 to 70 points	7	(seven)	(D)	

				71 to 80 points	8 (eight)	(C)
				81 to 90 points	9 (nine)	(B)
				91 to 100 points	10 (ten)	(A)
19	exam/ or transiti		entrance to the final e next year	60% active participation	on at the course	
20	Language of tea	aching / s	study	English		
21	Methods of mea teaching	asuring /	monitoring the quality of	Standardized tests, ob Self-evaluation	servation, surve	у
	Literature					
		Basic	literature			
		No	Author	Title	Publisher	Year
22	22.1	1.	Alan Dix, Janet Finlay, Gregory D.Abowd, Russell Beale	Human Computer Interaction	Prentice Hall	2003
		2.	Helen Sharp, Yvonne Rogers, Jennifer Preece	Interaction Design: beyond human- computer interaction	John Wiley & Sons, Inc.	2010
		3.	Andrew Sears and Julie A. Jacko	The Human– Computer Interaction Handbook	CRC Press	2017
	22.2	Additio	onal literature	-		
		No	Author	Title	Publisher	Year
		1.	Andrew Sears and Julie A. Jacko	The Human– Computer Interaction - Fundamentals	CRC Press	2012
		2.	Panayiotis Zaphiris, Chee Siang Ang	Human–Computer Interaction: Concepts, Methodologies, Tools, and Applications	Information Science Reference	2008
		3.	Constantine Stephanidis	User Interfaces for All: Concepts, Methods, and Tools	CRC Press	2000

Append	dix 3.	ourse for First cycle studies						
1.	Title of Course		Differential equations					
2.	Code		2FI135521					
3.	Study pro	ogram	Computer Engineering and Technologies					
4.	Organize program	r of the Study	Goce Delchev University – Stip Faculty of computer science					
5.	Level (firs	st, second or third studies)	First cycle					
6.	Academi	c year/ semester	IV/8	7.	Number of ECTS	4		
1.	Professo	r (s)	Associate Professor Biljana Zlatanovska, PhD					

2.	Require enrolling	ments the course	for	The students sho	ould have passed Mathematics 1 and Mathematics 2					
3.	Aims of The stud	the course	(compet ected to		content to use it in ot	her s	cientific dis	cipline	s and in	
4.	 Constant Coefficients, Nonhomogeneous Linear Equation; 4. Second Order Linear Equations: Reduction of Order, Undetermined Coefficients, Variation of Parameters; 5. Applications of Second Order Differential Equations: Motion of Object Hanging from a Spring, Electrical Circuits. 6. Higher Order Linear Differential Equations: Undetermined Coefficients, Variation of Parameter, Euler's Equation. 6. Methods of learning: 									
5.	Lectures	s, theoretica	al and pr		consultations; Semina ms; Consultations.	r wor	k/project; H	ome st	tudy;	
6.	Total an	nount of ava	ailable tir	me: 4 ECTS x 30	hours = 120 hours					
7.	Distribution of available time: 30+15+30+30+15 = 120 hours (2+1+1)									
8.	Forms of teaching 15.1 Lecture				ectures / theoretical, contact eaching, e-learning			30 hours		
	activities			Exercises (pr	Exercises (practical, laboratory, theoretical, seminars, teamwork)			1	5 hours	
			15.2 16.1	Projects				3	30 hours	
9.	Other activities		16.2	Individual work	Individual work			3	30 hours	
			16.3	Home learning			15 hours			
	Method assessn	of nent								
10.	17.1	Tests / Or			70 scores					
	17.2	Individual projects, p		(presentation,	10 scores					
	17.3	Activity ar	nd partici	pation	20 scores					
					up to 50 points	5	(five)	(F)		
					51 to 60 points	6	(six)	(E)		
11.	Accoser	nent Criteria	a (scores	e/pointe)	61 to 70 points	7	(seven)	(D)		
	700000				71 to 80 points	8	(eight)	(C)		
					81 to 90 points	9	(nine)	(B)		
					91 to 100 points	10	(ten)	(A)		
12.	exam/ o	e approval r transition		rance to the final ext year	60% success from all pre-exam activities, i.e. minimum 42 points from: the two colloquiums, the seminar work, the regularity of lectures and exercises.			ims, the		
13.	Langua	ge of teachi	ng / stuc	ly	English					

14.	Methods of quality of teac		ing / monitoring the	Self-evaluation				
	Literature							
		Basic	literature	-				
		No Author		Title	Publisher	Year		
15.	22.1	1.	William F. Trench	Elementary differential equations	Brooks/Cole Thomson Learning	2001, Free Edition December, 2013		
		2.	Gabriel Nagy	Ordinary differential equations	Mathematics Department, Michigan State University	2021		
		3.						
	22.2	Additio	onal literature					
		No	Author	Title	Publisher	Year		
		1.						