1.	Course	**Complexity theory and coding theory**			
2.	Code	**INF-S21**			
3.	Study programme	Informatics			
4.	Study programme organized by	Faulty of Computer Science and Engineering			
5.	Cycle	Third - PhD			
6.	Academic year / semester winter/summer/elective	first/second	7.	ECTS credits	6
8.	Teacher	Prof. D-r Dejan Spasov			
9.	Prerequisites	None			

10.	Course objectives (competencies):
	Studying the interaction between complexity theory and theory of codes.
	Studying the complexity of some underlying problems in coding theory, and application of codes in solving problems in the complexity theory.

11.	Course syllabus:
	Introduction, linear codes, Singleton bound, Plotkin bound, Varshamov bound.
	Reed Solomon codes, concatenation codes and codes of Justesen. The list-decoding.
	Expander codes; encoding and decoding in linear time.
	Localy decodable codes
	Complexity of decoding of linear codes and BDD problem

12.	Teaching methods:
	Classes supported with slide presentations, interactive teaching, lab equipment and other software packages, teamwork, case studies, invited guest lecturers, presentations of project works, e-learning materials, forums and consultations

13.	Total fund of work hours	7,5 EKTC x 30 h = 225 h	
14.	Available hours distribution	45+30+150 = 225	

15.	Teaching activities	15.1.	Theoretical classes	45 h
		15.2.	Practical classes (labs, exercises), seminars, team work	30 h
16.	Other activities	16.1.	Project tasks	50 h
		16.2.	Self study	50 h
		16.3.	Homework	50 h

17.	Grading		
	17.1.	Tests	40 points
	17.2.	Seminar work/ project (presentation: written and oral)	50 points
	17.3.	Active participation	10 points
18.	Grading criteria (points/grade)	to 59 points	5 (five) (F)
		from 60 to 68 points	6 (six) (E)
		from 69 to 76 points	7 (seven) (D)
		from 77 to 84 points	8 (eight) (C)
		from 85 to 92 points	9 (nine) (B)

		from 93 to 100 points	10 (ten) (A)
19.	Conditions for attending the final exam	Successful completion of activities 15.1 and 15.2	
20.	Language	Macedonian or English	
21.	Quality assessment	Internal evaluation and student pools	

22.	Literature					
	22.1.	Compulsory				
		No.	Author	Title	Publisher	Year
		1.	Arora S. and Barak B.	Computational complexity: Modern Approach	Cambridge University Press	2010
		2.	MacWilliams F.J., Sloane N.J.A.	The Theory of Error-Correcting Codes	North Holland	1977
		3.	Huffman W. C., Pless V.	Fundamentals of Error-Correcting Codes	Cambridge University Press	2003
	22.2.	Additional				
		No.	Author	Title	Publisher	Year
		1.	Alexander Barg	Complexity issues in coding theory (Handbook of Coding Theory)	North Holland	1999
		2.	Salil Vadhan	Pseudorandomness		
		3.	Venkatesan Guruswami	Algorithmic results in coding theory		