

1.	Course	<i>Introductory dynamical systems and control</i>		
2.	Code	KNI_E28		
3.	Study programme	Computer Science and Engineering PhD study programme		
4.	Study programme organized by	FCSE		
5.	Cycle	Third – PhD		
6.	Academic year / semester winter/summer/elective	7. ECTS credits 7,5		
8.	Teacher	Prof. d-r Lasko Basnarkov		
9.	Prerequisites	None		
10.	Course programme goals (competences): The course analyses dynamic systems – systems that evolve with time. These systems in most cases have an input and output that are connected. The goal of the course is for the students to learn how to model dynamic systems, analyze their behavior, and achieve the desired behavior. The course is useful for students that during their specialization will encounter dynamic systems – natural or man-made.			
11.	Course syllabus: Discrete systems. Continuous systems. Linear time-invariant systems. Dynamic system simulation. Time and frequency domain analysis. Internal and external stability. Connected systems and feedback. System observability. Stabilization. Observers and managers.			
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.	F. E. Udawadia , H.I. Weber and G. Leitmann	Dynamical Systems and Control (Stability and Control: Theory, Methods and Applications)	CRC Press	2004
		2.	Karl Johan Aström and Richard M. Murray	Feedback Systems: An Introduction for Scientists and Engineers	Princeton University Press	2008
	3.	João P. Hespanha	Linear Systems Theory	Princeton University Press	2009	
	22.2.	Additional				
		No.	Author	Title	Publisher	Year
		1.				
		2.				
3.						