

1.	Course	<i>Cognitive Robotics</i>		
2.	Code	KNI_E8		
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 Andrea Kulakov		
9.	Prerequisites	None		
10.	Course programme goals (competences): The goal of the course is to reach the modern methods for construction of cognitive robots that have properties like expectation, planning, self-thinking and self knowledge. The student will be capable to use construct cognitive robots.			
11.	Course syllabus: Cognitive robotics is a new approach to robots that is based on the abstraction of the perception primitives and high level action. These primitives are inspired by cognitive sciences like visual routines, possibilities, emotions, concience embodiment, thinking in social context. Cognitive robotics is exploiting ideas from cognitive sciences in order to make the robots smarter, thus making the robot behaviour more intuitive and transparent. The goal of this course is to reach the modern methods of constructing cognitive robots that have properties like expectation, planing, self-thinking, and self-knowledge. The newest approaches inspired by the brain processes will be reviewed, as well as the neral networks and neural architectures. Some of the topics to be explored are: perception: computer vision, various sensor types interpretation; cognition: artificial intelligence in robotics, knowledge representation, planing and learning; action: manipulation mechanics, hand eye coordination; humanoid robots imitation, etc.			
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.	S. Thrun, et. al.	Probabilistic Robotics	MIT Press	2005
		2.	Andrew N. Meltzoff, Wolfgang Prinz	The Imitative Mind: Development, Evolution and Brain Bases	Cambridge University Press	2002
		3.	Pedram Azad	Visual Perception for Manipulation and Imitation in Humanoid Robots	Springer	2009
	22.2.	Additional				
		No.	Author	Title	Publisher	Year
		1.	Jean-Marc Fellous, Michael A. Arbib	Who Needs Emotions?: The Brain Meets the Robot	Oxford University Press	2005
		2.	Leslie Brothers	Friday's Footprint: How Society Shapes the Human Mind	Oxford	1997
	3.					