1.	Course	*Advanced Human Computer Interfaces*	
2.	Code	KNI_E2	
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 Suzana Loshkovska	
9.	Prerequisites	none	

10.	Course programme goals (competences): Enabling the students to design different types of interfaces in order to provide human-computer interaction. Upon course completion the student is expected to have the knowledge about the advanced techniques for human-computer interaction and be able to use them in praxis.
11.	Course syllabus: Virtual & Augmented Reality - VR/AR. Human interfaces: visual, audio, tactile and locomotor systems. VR/AR technologies and metaphors. Multisensor interaction. Geometry modeling and behavior. Tactile interfaces. Real-time navigation in virtual and mixed worlds. Human factor. Augmented (mixed) systems and environments. Internet based VR/AR applications. Ubiquitous Computing. The "pervasive computing" paradigm. Definitions, idea, differences with the standard desktop metaphor. Ubiquitous computing architecture. Integration of the physical and virtual worlds. Human interaction with ubiquitous computers. Social aspects of ubiquitous computing. Applications and solution evaluation.
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.	W.R.Sherman, A. Craig	Understanding Virtual Reality: Interface, Application and Design, The Morgan Kaufman Series in Computer Graphics	Morgan Kaufmann Publishers	2003
		2.	R. Hainich	The End of Hardware, 3rd Edition: Augmented Reality and Beyond	BookSurge Publishing	2009
		3.	O. Bimber, R. Raskar	Spatial Augmented Reality: Merging Real and Virtual Worlds	A. K. Petters Ltd	2005
	22.2.	Additional				
		No.	Author	Title	Publisher	Year
		1.	A. Pirhonen, H. Isomaski, C. Roast and P. Saariluoma (Eds)	Future Interaction Design	Springer-Verlag London Limited	2005
		2.	J. Krumm	Ubiquitous Computing Fundamentals	CRC Press	
		3.				