1.	Course		*Spatial-temporal GIS Analysis*	
2.	Code		KNI_E24	
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 Kosta Mitreski	
9.	Prerequisites		None	
10.	Course programme goals (competences): The students will be able to apply the GIS tools and develop algorithms for spatial-temporal data analysis.			
11.	Course syllabus: Introduction to GIS. Example GIS applications. Geographical data (types, relations, measurements, dimensions, aggregations). Visualizing spatial data (GIS architecture, raster and vector based, conversions, topology, continuous data). Data sources. Analyzing the sensor data attribute values. Validation and verification of the spatial-temporal data quality. Database design. Digital map creation based on the database structure. Data mining techniques for analyzing spatial-temporal data. Post-processing of spatial-temporal sensor data. Applying techniques for defined system model visualization, geo-spatial sensor data analysis, DEM (Digital Elevation Model) processing algorithms, 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.	Harmon J., Anderson S.	The design and implementation of Geographic Information Systems	John Wiley & Sons	2003
		2.		Advanced Spatial Analysis	ESRI Press	2008
		3.	Maguire D., Batty M., Goodchild M.	GIS Spatial Analysis and Modeling	ESRI Press	2005
	22.2.	Additional				
		No.	Author	Title	Publisher	Year
		1.				
		2.				
		3.				