1.	Course title	Intelligent systems
2.	Course code	CSES614
3.	Study program	Computer science and engineering
4.	Unit offering the course	**FCSE**
5.	Undergraduate/postgraduate/PhD	**Undergraduate**
6.	Year/semester 3/summer	7. ECTS: **6**
8.	Teacher(s)	dr. Ljupco Kocarev, dr. Ana Madevska-Bogdanova, dr. Dejan Gjorgjevik, dr. Sonja Gievska, dr. Andrea Kulakov, dr. Slobodan Kaljadziski, dr. Nevena Ackovska, dr. Igor Trajkovski
9.	Course prerequisites	
10.	Goals (competences): The aim of the course is to provide introductory knowledge on selected topics in the field of intelligent systems. It introduces the basic techniques of machine learning, data mining, cognitive science, natural language processing, as well as application the area of bioinformatics. Students will learn and acquire a deeper understanding of the challenges and approaches in designing intelligent systems and with the provided assignments they will be trained to developed practical skills for solving concrete classification and prediction systems.	
11.	Course content: Modelling real-life systems (conceptual, symbolic, functional, matrix notations, Petri nets). Learning theory. An introduction to classification problems, classificatory models, and data mining. Bioinformatics (central dogma of molecular biology, object recognition, case-studies). Natural language processing techniques. Cognitive science (perception, reasoning, knowledge representation and learning).	
12.	Teaching methods: lectures with presentations, interactive lectures, lab classes, exercises, team work, invited guest lectures, student projects and homework	
13.	Total available time	6 EKTS x 30 = 180 hours
14.	Distribution of the available time	30 + 60 + 50 + 20 + 20 = 180

15.	Teaching activities	15.1.	Lectures	30 hours
		15.2.	Training (labs, problem solving), seminar and team work	60 hours
16.	Other activities	16.1.	Project work	50 hours
		16.2.	Self study	20 hours
		16.3	Home work	20 hours

17.	Grading		
	17.1.	Tests	35 points
	17.2.	Seminar work/project (written or oral presentation)	50 points

	17.3.	Active participation		15 points
18.	Grading criteria		to 50 points	5 (five) (F)
			from 61 to 60 points	6 (six) (E)
			from 61 to 70 points	7 (seven) (D)
			from 71 to 80 points	8 (eight) (C)
			from 81 to 90 points	9 (nine) (B)
			from 91 to 100 points	10 (ten) (A)
19.	Final exam prerequisites		Completed 15.2 and 16.1	
20.	Course language		Macedonian and English	
21.	Quality assurance methods		Internal evaluations and surveys	

22.	Literature					
	22.1.	Compulsory				
		No.	Authors	Title	Publisher	Year
		1.	Adrian A. Hopgood	Intelligent Systems for Engineers and Scientists, Third Edition	CRC Press	2011
		2.	S. Sumathi, Surekha Paneerselvam	Computational Intelligence Paradigms Theory & Applications using MATLAB	CRC Press	2010
		3.				
	22.2.	Mandatory				
		No.	Authors	Title	Publisher	Year
		1.				
		2.				
		3.				