1.	Course title	**Bioinformatics**		
2.	Course code	IIS-I-10		
3.	Study program	**Intelligent information systems**		
4.	Unit offering the course	**FCSE**		
5.	Undergraduate/master/PhD	**Master**		
6.	Year/semester 1/summer/elective	7. ECTS: **6**		
8.	Teacher(s)	associate professor Slobodan Kalajdziski		
9.	Course prerequisites	None		
10.	Goals (competences): The student will be able to use the techniques for modeling, analysis and manipulation of bioinformatic data.			
11.	Course content: In this course the overview of the basic concepts of bioinformatics will be given. The structure of the course will cover the basic concepts of the central dogma in molecular biology. Management systems bioinformatics databases and their application. Global / local alignment pairs sequences, aligning multiple sequences, patterns of substitution, searching databases of sequences, BLAST and its variations, a Markov model and hidden profiling sequences. Techniques for the experimental determination of protein structure (NMR spectroscopy, X-ray crystallography), the format of protein structure, PDB files, structural classification schemes (CATH, SCOP), structure prediction and alignment, determining the function from the structure, comparative modelling, bend recognition etc.			
12.	Teaching methods: Lectures supported by slide presentations, interactive lectures, trainings (using lab equipment and software packages), team work, case studies, invited guests and lectures, individual practical assignments presentations, seminar paper, e-learning (forums, consultations).			
13.	Total available time	6 ECTS x 30 hours = 180 hours		
14.	Distribution of the available time	130 + 0 + 50 = 180 hours		
15.	Teaching activities	15.1.	Lectures	130 hours
		15.2.	Training (labs, problem solving), seminar and team work	0 hours
16.	Other activities	16.1.	Project work	15 hours
		16.2.	Self study	15 hours
		16.3.	Home work	20 hours
17.	Grading			
	17.1.	Tests		65 points
	17.2.	Seminar work/project (written or oral presentation)		25 points
	17.3.	Active participation		10 points
18.	Grading criteria	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.	Final exam prerequisites		Successfully completed activities 15.1 and 15.2			
20.	Course language		Macedonian and English			
21.	Quality assurance methods		Internal evaluation and student questionnaires			
22.	Literature					
	22.1.	Compulsory				
		No.	Authors	Title	Publisher	Year
		1.	Robert Weaver	Molecular Biology	McGraw Hill Higher Education; 4 edition	2007
		2.	Ingvar Eidhammer, Inge Jonassen, William R. Taylor	Protein Bioinformatics: An Algorithmic Approach to Sequence and Structure Analysis	Wiley, 1 edition	2004
		3.	Philip E. Bourne, Helge Weissig	Structural Bioinformatics	Wiley-Liss, 1 edition	2003
	22.2.	Additional				
		No.	Authors	Title	Publisher	Year
		1.	Arthur M. Lesk	Introduction to Protein Architecture: The Structural Biology of Proteins	Oxford University Press, USA, 1 edition	2001
		2.				
		3.				