1.	Course Title	Introduction to Bioinformatics		
2.	Code	F18W3S085		
3.	Study program	Software engineering and information systems		
4.	Study Program Organizer	Faculty of Computer Science and Engineering		
5.	Degree (first, second, third cycle)	first cycle		
6.	Academic year / semester 4 / winter / optional	7. ECTS credits 6		
8.	Teacher	full professor Ana Madevska Bogdanova, associate professor Nevena Ackovska		
9.	Course enrollment prerequisites	Машинско учење или Вештачка интелигенција		
10.	Course program goals (competencies): The goal of the course is to get the students to become acquainted with the areas and problems that cover bioinformatics, to be able to perform gene and protein sequential analysis, to use biological bases data, to learn computational methods for solving problems in the molecular biology.			
11.	Course program content: What is bioinformatics. Central paradigm in bioinformatics. DNA sequential analysis. RNA and prediction of the secondary structure of proteins. Tertiary protein structures and their relationship to protein function. Introduction to computational tools and algorithms for solving problems from molecular biology. Terms of gene expression and technology microwaves. The notion of systemic biology. Management Structures in Bioinformatics. DNA programming. Using genomic and protein bases data. Introduction to genetic engineering.			
12.	Learning methods: Lectures using presentations, interactive lectures, exercises (using equipment and software packages), teamwork, case studies, invited guest lecturers, independent preparation and defense of a project assignment and seminar work.			
13.	Total available time	6 ECTS x 30 hours = 180 hours		
14.	Distribution of the available time	30 + 45 + 15 + 15 + 75 = 180 hours		
15.	Teaching activity forms	15.1.	Lectures – theoretical teaching	30 hours

		15.2.	Exercises (laboratory, auditory), seminar papers, teamwork	45 hours
16.	Other activity forms	16.1.	Project Tasks	15 hours
		16.2.	Independent Learning Tasks	15 hours
		16.3.	Home learning	75 hours

17.	Assessment methodology		
	17.1.	Tests	10 points
	17.2.	Seminar paper/project (presentation: written and oral)	40 points
	17.3.	Activity and learning	10 points
	17.4.	Final exam	40 points

18.	Assessment criteria (points/grade)	up to 50 points	5 (five) (F)
		51 to 60 points	6 (six) (E)
		61 to 70 points	7 (seven) (D)
		71 to 80 points	8 (eight) (C)
		81 to 90 points	9 (nine) (B)
		91 to 100 points	10 (ten) (A)
19.	Course completion and final exam requirements	Realized activities 15.1 and 15.2	
20.	Teaching Language	Macedonian and English	
21.	Teaching quality evaluation method	Internal evaluation mechanisms and questionnaires	

22. Course Material

22.1. Mandatory course material

No.	Author	Title	Publisher	Year
1	Neil C. Jones and Pavel A. Pevzner	An Introduction to Bioinformatics Algorithms	MIT Press	2004
2	Harvey Lodish, Arnold Berk, Chris A. Kaiser, Monty Krieger, Anthony Bretscher, Hidde Ploegh, Angelika Amon, Matthew P. Scott	Molecular Cell Biology -8th edition	W. H. Freeman	2016

22.2. Additional course material

No.	Author	Title	Publisher	Year