

1.	Course title	Introduction to Mathematical Biosciences		
2.	Course code	BIO-I-05		
3.	Study program	Master studies in Information Sciences and Computer engineering		
4.	Unit offering the course	FCSE		
5.	Undergraduate/master/PhD	Master		
6.	Year/semester 1/winter/compulsory	7. ECTS: 6		
8.	Teacher(s)	Assistant Professor Elena Hadzieva		
9.	Course prerequisites	None		
10.	Goals (competences): The student will be capable to understand some mathematical methods that are used in mathematical biosciences.			
11.	Course content: Cell structure. Nerve cells. Introduction to dynamical systems and Neuronal Dynamics. One Dimensional equation. Two Dimensional Systems. Dynamical models in biology. Definition of Fractal. Biologic Cell Morphometry – Fractal Dimension. Fractal Analysis of bio signals.			
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	30 + 15 + 135 = 180 hours		
15.	Teaching activities	15.1.	Lectures	30 hours
		15.2.	Training (labs, problem solving), seminar and team work	15 hours
16.	Other activities	16.1.	Project work	60 hours
		16.2.	Self study	25 hours
		16.3.	Home work	50 hours
17.	Grading			
	17.1.	Tests		45 points
	17.2.	Seminar work/project (written or oral presentation)		45 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.	A. Borisyuk, G. B. Ermentrout, A. Friedman, D. H. Terman	Tutorials in Mathematical Biosciences I: Mathematical Neuroscience	Springer-Verlag, Berlin Heidelberg	2005
		2.	M. Farkas	Dynamical models in Biology	Elsevier Science & Technology Books	2001
	3.	G. Losa, T. Nonnenmacher, D. Merlini, E. R. Weibel	Fractals in Biology and Medicine, Volume II	Birkhäuser Verlag	1998	
	22.2.	Additional				
No.		Authors	Title	Publisher	Year	
1.		S. H. Strogatz	Nonlinear dynamics and Chaos: Applications to Physics, Biology, Chemistry, and Engineering	Perseus	2001	
2.						
3.						