1.	Course Title	Signal processing
2.	Code	F18L3S047
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 3 / summer / mandatory	7. ECTS credits 6
8.	Teacher	associate professor Lasko Basnarkov, assistant professor Petre Lameski
9.	Course enrollment prerequisites	Инженерска математика или Калкулус 2

10.	Course program goals (competencies): Knowledge of the basic techniques for digital signal processing is important for every engineer who works on applications where any signal processing is involved. Within this course the students are introduced to the theoretical grounds of digital signal processing which include discretization, Fourier and Z-transform. The students will gain knowledge for basic tools like the digital IIR and FIR filters. Within this course are also included the basics of the control theory. Through numerous examples and exercises the students will learn to use tools for signal processing.
11.	Course program content: Fourier transform and discrete time Fourier transform. Relationships between Fourier transforms and their properties. Fast Fourier transform. Linear time invariant systems. Z-transform and inverse Z-transform. Digital filters. Filter design. Sampling and interpolation. Stochastic signal processing and quantization. Two dimensional Fourier analysis. Control theory basics.
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)	10 points
	17.3.	Activity and learning	10 points
	17.4.	Final exam	70 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	Paolo Prandoni and Martin Vetterli	Signal Processing for Communications	EPFL Press	2008
2	Winser Alexander and Cranos Williams	Digital Signal Processing: Principles, Algorithms and System Design	Academic Press	2016
3	Li Tan and Jean Jiang	Digital Signal Processing: Fundamentals and Applications	Academic Press	2013

22.2.	Additional course material				
No.	Author	Title	Publisher	Year