1.	Course Title	Statistical modelling		
2.	Code	F18L3S163		
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 / optional	7. ECTS credits 6		
8.	Teacher	full professor Zhaneta Popeska, assistant professor Biljana Tojtovska		
9.	Course enrollment prerequisites	Веројатност и статистика или Бизнис статистика		
10.	Course program goals (competencies): The students should learn how to make the statistical analysis of data, using the classical and Bayesian approach. They should set suitable statistical models and check and interpret the obtained results. The accent will be on the use of open source software (R, Python) for building models based on real data, using the presented theory. The course should prepare the students for data analysis in different research fields.			
11.	Course program content: Every topic will be illustrated with corresponding real world examples. Introduction to data modelling. General methods for simulation of random variables. Correlation and linear regression., estimation of functional dependance of data. Parametric models of regression functions. Simple linear regression. Analysis of variance (ANOVA). Multiple regression. Logistic regression, binary and multiple logistic regression. Choice of classification model. Principle component analysis,log-linear models. Nonparametric estimation of regression functions and classification:nearest neighbour method, naive Bayes. Support vector machine. Comparison of the methods. Bayesian methods for parameter estimation. Models for collection of data for Bayesian modelling.			
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	0 points
	17.2.	Seminar paper/project (presentation: written and oral)	10 points
	17.3.	Activity and learning	10 points
	17.4.	Final exam	80 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	Peter D. Hoff	A First Course in Bayesian Statistical Methods	Springer	2009
	2	Dirk P. Kroese, Joshua C.C. Chan	Statistical Modeling and Computation	Springer	2014
	3	Douglas C. Montgomery, George C. Runger	Applied Statistics and Probability for Engineers	Wiley	2014
	4	George W. Snedecor, William G. Cochran	Statistical Methods	Iowa Syaye University Press	1989
	5	Murray Aitkin, Brian Francis, John Hinde, Ross Darnell	Statistical modelling in R	QXFORD University Press	2009

22.2. Additional course material

No.	Author	Title	Publisher	Year