Faculty of Philosophy / SOCIOLOGY / Statistical Methodology

Course:	Statistical Methodology			
Course ID	**Course status**	**Semester**	**ECTS credits**	**Lessons** (Lessons+Exercises+Laboratory)
12566	Mandatory	1	6	2+2+0
Programs	SOCIOLOGY			
Prerequisites	No.			
Aims	The goal of this course is the adoption of more complex statistical procedures that are applied when processing data in sociological research, as well as familiarization with statistical software (R, SPSS,...).			
Learning outcomes	After passing this course, the student will know how to use appropriate software (R, SPSS, ...) for statistical data analysis, to use built-in and imported software packages and data for their preparation, visualization and processing, as well as, using appropriate statistical methods, the student is able to make a conclusion about the observed phenomenon to which the data refer.			
Lecturer / Teaching assistant	Biljana Stamatovic, full professor			
Methodology	Lectures. Exercises. Consultations. Teaching will be conducted in a computer classroom, discussions will be held in class, students will have homework through which they will encounter a case study.			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Basic Statistics. Life cycle of data analysis. Introduction to R.			
I week exercises	Steps to use the software (download, installation, graphical environment, saving files, ...)			
II week lectures	Data types in R. Value assignment. Vector.			
II week exercises	Data types in R. Value assignment. Vector.			
III week lectures	Vector. Matrix. List.			
III week exercises	Vector. Matrix. List.			
IV week lectures	Data frames. NaN. Na. Loading data. Use of data from the internet.			
IV week exercises	Data frames. NaN. Na. Loading data.			
V week lectures	Descriptive statistics and corresponding functions through R.			
V week exercises	Descriptive statistics and corresponding functions through R. Functions sapply(), lapply(), mapply().			
VI week lectures	Exam.			
VI week exercises	Exam.			
VII week lectures	Data visualization.			
VII week exercises	Data visualization. Plot. Histogram. Barplot. Box plot.			
VIII week lectures	Discrete random variable. Four built-in distribution functions.			
VIII week exercises	Discrete random variable. Illustrations through R. Four distribution functions (for example, the binomial pbinom, qbinom, dbinom, rbinom).			
IX week lectures	A continuous random variable. Four built-in distribution functions.			
IX week exercises	A continuous random variable. Illustrations through R. Four functions for distributions (for example, the normal distribution pnorm, qnorm, dnorm, rnorm).			
X week lectures	Parameter estimation expected value, standard deviation, frequency,...			
X week exercises	Parameter estimation using the quantile functions.			
XI week lectures	Confidence intervals.			
XI week exercises	Confidence intervals (lm, confint).			
XII week lectures	Hypothesis testing.			
XII week exercises	Hypothesis testing (p-value and confidence level).			
XIII week lectures	Correlation and regression analysis (linear regression model).			
XIII week exercises	Correlation and regression analysis (lm, residuals).			

XIV week lectures	ANOVA.
XIV week exercises	ANOVA (aov, TukeyHSD).
XV week lectures	Popravni kolokvijuma.
XV week exercises	Popravni kolokvijuma.
Student workload	6

Per week	**Per semester**
6 credits x 40/30=8 hours and 0 minuts 2 sat(a) theoretical classes 0 sat(a) practical classes 2 excercises **4 hour(s) i 0 minuts** of independent work, including consultations	Classes and final exam: **8 hour(s) i 0 minuts x 16 =128 hour(s) i 0 minuts** Necessary preparation before the beginning of the semester (administration, registration, certification): **8 hour(s) i 0 minuts x 2 =16 hour(s) i 0 minuts** Total workload for the subject: **6 x 30=180 hour(s)** Additional work for exam preparation in the preparing exam period, including taking the remedial exam from 0 to 30 hours (remaining time from the first two items to the total load for the item) **36 hour(s) i 0 minuts** Workload structure: **128 hour(s) i 0 minuts (cources), 16 hour(s) i 0 minuts (preparation), 36 hour(s) i 0 minuts (additional work)**
Student obligations	Mandatory attendance.
Consultations	Consultations will be scheduled in agreement with the students.
Literature	EMC2, Data Science & Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data, John Wiley & Sons, 2015 Barry H. Cohen, R. Brooke Lea, Essentials of Statistics for the Social and Behavioral Sciences, John Wiley & Sons, 2004 Jay Alan Weinstein, Applying Social Statistics, ROWMAN & LITTLEFIELD PUBLISHERS, 2010 Mohammed A. Shayib, Applied Statistics, 2013
Examination methods	Homework - maximum 20 points Exam- maximum 30 points Final exam - maximum 45 points Attendance - maximum 5 points
Special remarks	A student has passed the exam if he has a cumulative score of 50 or more points.
Comment	No.

Grade:	F	E	D	C	B	A
Number of points	less than 50 points	greater than or equal to 50 points and less than 60 points	greater than or equal to 60 points and less than 70 points	greater than or equal to 70 points and less than 80 points	greater than or equal to 80 points and less than 90 points	greater than or equal to 90 points