

Faculty of Philosophy / PEDAGOGY / Statistics in Pedagogy

Course:	Statistics in Pedagogy			
Course ID	Course status	Semester	ECTS credits	Lessons (Lessons+Exercises+Laboratory)
2584	Mandatory	4	6	3+1+0
Programs	PEDAGOGY			
Prerequisites	None.			
Aims	Introducing the role of statistics in pedagogical surveys. Understanding the significance of statistical methods and statistical tests to be applied in different pedagogical surveys.			
Learning outcomes	After passing this exam a student will be able to: 1. Understand the importance of Statistics in pedagogy and importance of pedagogical research. 2. Understand the basic statistical concepts. To make difference between continuous and categorical variables, and to distinguish scales of measurement. 3. Group and analyze the data, determines the presence of non-standard observations. 4. Calculate measures of central tendency and measures of variability. 5. Understand the importance of normal and to recognize the asymmetric distribution. Recognize the importance of asymmetric distribution in modeling statistical data. 6. Implement and interpret the parametric and non-parametric statistical tests. 7. Understand the difference between parametric and non-parametric statistical analysis. 8. Work with raw data and apply proper statistical techniques. 9. Implement these statistical techniques in some of the software for data processing (eg. IBM Statistics).			
Lecturer / Teaching assistant	Božidar V. Popović, PhD.			
Methodology	Lectures, exercises, consultations.			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Subject, tasks and importance of statistics in pedagogy. The basic statistical terms, the grouping of statistical data.			
I week exercises	Grouping of statistical data (Sturges formula). Levels of measurement. Examples.			
II week lectures	The categorical variables and its frequency. Calculation of absolute and relative frequencies.			
II week exercises	The frequency and mode. Examples.			
III week lectures	Continuous variables. The mean value.			
III week exercises	The calculation of the mean value. Examples.			
IV week lectures	The weighted mean. The mean value for grouped data.			
IV week exercises	The mean value for grouped and ungrouped data. Examples.			
V week lectures	Absolute and relative variability measures (variance, standard deviation, coefficient of variation).			
V week exercises	The variance and standard deviation for grouped and ungrouped data. Examples.			
VI week lectures	Introduction to combinatorics (permutations, variations and combinations without repetition).			
VI week exercises	The elementary exercises related to basic combinatorics. Examples.			
VII week lectures	The discrete and continuous probability distributions (binomial, Poisson, normal and Student).			
VII week exercises	The elementary exercises related to introduced probability distributions. Examples.			
VIII week lectures	Different chart types (histograms, line charts, box plot). The outlier detection. The measures of distribution asymmetry: skewness and kurtosis.			
VIII week exercises	Outliers and recognition of asymmetric distribution using row statistical data. Examples.			
IX week lectures	Testing of statistical hypothesis testing. Parametric statistical analysis - t test for two independent samples.			
IX week exercises	t test for two independent samples. Examples.			
X week lectures	t test for two dependent samples.			
X week exercises	t test for two dependent samples. Examples.			
XI week lectures	Correlation. Pearson coefficient of correlation and its statistical significance.			
XI week exercises	Pearson coefficient of correlation and its statistical significance. Examples.			

XII week lectures	Simple linear regression (estimation of coefficients, interpretation). Significance of the slope coefficient.					
XII week exercises	Simple linear regression and estimation of coefficients. Linear regression interpretation. Significance of the slope coefficient. Examples.					
XIII week lectures	Nonparametric statistics. Spearman correlation coefficient and testing of its statistical significance.					
XIII week exercises	Spearman correlation coefficient and testing of its statistical significance. Examples.					
XIV week lectures	Mann Whitney test. Difference between Mann Whitney and t test for two independent samples.					
XIV week exercises	Mann Whitney test. Examples.					
XV week lectures	Wilcoxon test. Difference between Mann Whitney and t test for two independent samples.					
XV week exercises	Wilcoxon test. Examples.					
Student workload	Lectures and the final exam: (5 h 20 min) x 16 = 85 hours and 20 minutes . Preparation before the start of the semester (administration, enrollment, etc) 2 x (5 hours and 20 minutes) = 10 hours and 40 minutes. Total work hours for subject to 4x30 = 120 hours. Structure: 85 hours and 20 minutes. (Lectures) + 10 hours and 40 minutes. (Preparation) + 24 hours (additional work)					
Per week			Per semester			
6 credits x 40/30=8 hours and 0 minuts 3 sat(a) theoretical classes 0 sat(a) practical classes 1 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			Students are required to attend lectures and exercises. The exercises are carried out on the exercises hours.			
Consultations			After the lectures.			
Literature			1. Ho, R. (2014). Handbook of Univariate and Multivariate Data Analysis with IBM SPSS, second edition (hbk), Chapman & Hall / CRC Press, xxiii+561 pages			
Examination methods			Two tests of 20 points (40 points in total), Active participation in lectures and exercises up to 10 points, Final exam up to 50 points. To pass the exam 51 points is needed.			
Special remarks			Lectures and exercises are partly realized by using raw statistical databases in order to acquire some SPSS commands.			
Comment						
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