



ЦЕНТЪР ЗА ОБУЧЕНИЕ – БАИ

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TEMPLATE FOR A SPECIALIZED DOCTORAL COURSE (in English)

Basic Information:

Course Title: Statistical Methods in Psychology and the Social Sciences.

Lecturer: Svetoslav Bliznashki

Email: valsotevs@gmail.com

Total Teaching Hours: 30 hours.

Annotation (up to 150 words)

The suggested course aims to familiarize participants with some basic ideas underlying the most frequently used statistical methods in the behavioral and social sciences. This introductory course involves thirty (30) lectures and involves the introduction several basic concepts including populations and samples, probability distributions, and measures of central tendency and dispersion. Having laid down these foundational ideas, we will proceed with introducing more complex techniques involving statistical tests of one, two, and several means; in this context we will also discuss concepts such as null hypothesis significance testing, p-values, and errors from types one and two. The syllabus continues with two modules introducing measures of association between variables including correlational and multiple regression analyses and ends with a discussion regarding some basic diagnostic methods which also illustrate the Bayes theorem. Complying with the applied nature of the proposed curriculum, we will make use of many practical examples throughout the course. These examples will be considered by using the popular and readily available software products Microsoft Excel and SPSS.

Course content (brief description by topics or modules)

Module 1: Introduction to the software tools (Excel and SPSS);

Module 2: Basic concepts used in descriptive statistics (measures of central tendency, measures of dispersion, measures of association, z-scores, percentiles);

Module 3: Properties of variance and covariance;

Module 4: Distributions (probability density and cumulative functions; Normal Distribution);

Module 5: Population and sample: Sampling distributions. Sampling distribution of the mean and the Central Limit Theorem;

Module 6: Null Hypothesis Significance Testing in the context of a single mean;

Module 7: Null Hypothesis Significance Testing in the context of the difference between two means;

Module 8: Null Hypothesis Significance Testing in the context of more than two means. Analysis of Variance (ANOVA);

Module 9: Two-Way Full Factorial Design. Main Effects, Simple Main Effects, Interaction;

Module 10: Within-Subjects Design. Paired-Samples t-test; Repeated Measures ANOVA;

Module 11: Simple linear regression involving a single predictor;

Module 12: Multiple regression with two or more predictors;

Module 13: Binary Logistic Regression (the dependent measure is dichotomous);

Module 14: Bayes Theorem. Classification table, Sensitivity, Specificity, likelihood, prior probability, posterior probability;

Module 15: Receiver's Operating Characteristic (ROC) Curve. Summary and discussion.



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Teaching and assessment methods

The course involves a face-to-face form of education.

The course concludes with a multiple-choice test on the material.

Competencies acquired as a result of training (3–5 points)

Students who complete the course successfully should be able to select an appropriate analytic method based on the specific data obtained from a behavioral study; they should also be able to conduct the analysis using SPSS as well as to accurately interpret and report the obtained results.

Literature:

Required Reading:

Калинов, К. (2011). Статистически методи в поведенческите и социалните науки. *Издавателство на Нов български университет.*

Optional Reading:

Клаус, Г., Ебнер, Х. (1971). Основи на статистиката за психолози, социолози и педагози. *Наука и изкуство, 1⁶⁰ изд.*

Dawson, B., Trapp, R. (2004). Basic & Clinical Biostatistics. Lange Medical Books / McGraw-Hill, 4th Ed.

Field, A. (2013). Discovering Statistics Using IBM SPSS. *Sage Publications, 4th Ed.*

Kruschke, J. (2014). Doing Bayesian Data Analysis: A Tutorial with R, Jags, and STAN. *Academic Press, 2nd Ed.*

Shaughnessy, J., Zechmeister, E., Zechmeister, J. (2000). Research methods in Psychology. *McGraw Hill, 5th Ed.*

Tabachnick, B., Fidell, L. (2018). Using Multivariate Statistics. *Pearson, 7th Ed.*

Tacq, J. (1997). Multivariate Analysis Techniques in Social Science Research: From Problem to Analysis. *Sage Publications, 1st Ed.*

Wilcox, R. (2003). Applying Contemporary Statistical Techniques. *Academic Press, 1st Ed.*

Additional information (optional) (e.g., special requirements, laboratory equipment, prior knowledge)

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