CCNM17-107, Statistics and Methodology, Course Description

Aim of the course

Aim of the course: The course starts with an introduction of basic concepts of statistics and continues with methods of univariate statistics. Depending on the audience, we can also address more complex methods such as multiple regression, analysis of covariance, MANOVA, and exploratory factor analysis. For carrying out statistical tests we use SPSS and R-Studio.

Learning outcome, competences

knowledge:

- students are expected to get familiarity with statistical methods available in SPSS environment.
- students get deeper understanding of effect sizes, statistical power, and the limitations of the
- traditional hypothesis testing.

attitude:

- students are expected to gain confidence in making their own statistical analyses, checking the
- assumptions and understanding the outputs
- students are expected to think creatively and flexibly while applying the learnt knowledge in practice

skills:

- we aim to learn the structure of database, data cleaning, data transformations.
- we aim to prepare students to analyze their own data with IBM SPSS software flexibly and
- compose their MA theses.
- we aim to prepare students to interpret their results precisely and appropriately

Content of the course

Topics of the course

- distributions and estimation of distribution parameters;
- hypothesis testing,
- types of errors,
- significance, power,
- effect size
- correlation and regression;
- comparing two or more means;
- between-subject and within-subject designs;
- non-parametric methods

Learning activities, learning methods:

Lectures and interactive discussions

Evaluation of outcomes

Learning requirements, mode of evaluation, criteria of evaluation:

requirements

- Data analysis methods
- Summarizing the methodological literature

mode of evaluation: Two statistical exams and project work

criteria of evaluation:

- 1-5 grading
- the final grade is the average of the two exams (it is rounded mathematically to the nearest integer)

Reading list

Compulsory reading list

- Coolican, H. (2014). Research Methods in Statistics and Psychology. London: Psychology Press
- Field A. (2013). Discovering Statistics Using IBM SPSS Statistics 4th edition, Sage Publications.
- Chapter 3. – The IBM SPSS Statistics environment pp. 89-120.
- Chapter 4. – Exploring Data with graphs pp. 121-163.
- Chapter 5. – The beast of bias pp. 163-211.
- Chapter 7. – Correlation pp. 270-292.
- Chapter 8. – Regression pp. 314-356.
- Chapter 10. – Moderation, mediation and more regression pp. 392-428.
- Chapter 19. – Logistic regression pp. 775-799.
- Chapter 9. – Comparing two means pp. 371-391.
- Chapter 6. – Non-parametric models 213-261.
- Chapter 11. – Comparing several means: ANOVA (GLM 1) pp. 460-477.
- Chapter 12. – Analysis of covariance, ANCOVA (GLM 2) pp. 488-506.
- Chapter 13. – Factorial ANOVA (GLM 3) pp. 520-542.
- Chapter 14. – Repeated-measures designs (GLM 4) pp. 555-590.
- Chapter 17. - Exploratory factor analysis pp. 686-706.
- Chapter 18. - Categorical data pp. 736-746.

Recommended reading list

- Tabachnick, B. G., & Fidell, L. S. (2012). Using multivariate statistics (6th ed.). Boston: Pearson
- Education.
- Hayes, A. F. (2013). Introduction to mediation, moderation, and conditional process
- analysis: a regression-based approach. New York: The Guilford Press.