Course Description
Title of the Course: General Research Methods and Multivariate Statistics

Aim of the course

Aim of the course: Students are introduced to the most common multivariate analyses used within the field of psychology. This course is designed to provide students with a working knowledge of the basic concepts underlying the most important multivariate techniques, with an overview of actual applications.

Learning outcome, competences

knowledge:

- students are expected to know the most frequently used multivariate statistical analyses in psychological research and their practical applications and applicability
- students are expected to know the assumptions of the most frequently used multivariate statistical analyses
- students are expected to know how to report the learned analyses in APA format
- students are expected to know the limitations of the learned analyses

attitude:

- students are expected to gain confidence in making their own decisions about statistical procedures
- students are expected to think creatively and flexibly while applying the learnt knowledge in practice

skills:

- We aim to prepare students to use their statistical knowledge flexibly and be able to compose their MA theses.
- Students are acquiring the judicious selection of analyses, with the applicability and interpretation of them

Content of the course

Topics of the course

- Introduction to multivariate statistics and multivariate data.
- Correlation and simple linear regression analysis.
- Multiple linear regression analysis.
- Logistic regression analysis.
- Introduction to analysis of variance (ANOVA).
- Factorial ANOVA, analysis of covariance (ANCOVA)
- Multivariate analysis of variance (MANOVA)
- Principal component analysis and exploratory factor analysis.
- To fulfil the students' interest the following topics could also be covered optionally: hierarchical cluster analysis, non-hierarchical cluster analysis, discriminant analysis, analyzing missing data, residual analysis, configuration analysis, introduction to multilevel linear models, confirmatory factor analysis.

Learning activities, learning methods

- interactive lecture is the method of instruction

- students are acquiring the judicious selection of analyses, with the usage and interpretation of them through several educatory examples
- students get Power Point presentations and detailed written handouts of the material

Evaluation of outcomes

Learning requirements, mode of evaluation, and criteria of evaluation:

The grade consists of the result of the final exam that should have to be passed

mode of evaluation:

- 5-level grading, based on the achieved scores in percentages

criteria of evaluation:

- GRADING based on scores achieved:
  0-50 % = 1 (failed)
  51-65 % = 2 (passed)
  66-79 % = 3
  80-89 % = 4
  90-100 % = 5

Reading list

Compulsory reading list

- Field A. (2013). *Discovering Statistics Using IBM SPSS Statistics 4th edition,* Sage Publications.
  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 19. – Logistic regression pp. 775-799.
  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 16. – Multivariate Analysis of Variance – MANOVA pp. 623-664.
  Chapter 17. - Exploratory factor analysis pp. 686-706.

Recommended reading list

- Tabachnick, B. G., & Fidell, L. S. (2012). *Using multivariate statistics* (6th ed.). Boston: Pearson Education.
- Brown, T. A. *(2006). Confirmatory Factor Analysis for Applied Research,* The Guilford Press, 40-156.
- Field A. (2013). *Discovering Statistics Using IBM SPSS Statistics 4th edition,* Sage Publications. – Chapter 20. Multilevel linear models pp. 814-866.
- Vargha, A., Torma, B. & Bergman, L. R. (2015). ROPstat: a general statistical package useful for conducting person-oriented analyses. *Journal for Person-Oriented Research*, *1 (1-2)*, 87-98. http://www.person-research.ouradmin.se/articles/volume1_1_2/filer/20.pdf
- Vargha, A., Bergman, L. R. & Takács, S. (2016). Performing cluster analysis within a person-oriented context: Some methods for evaluating the quality of cluster solutions. *Journal for Person-Oriented Research*, *2 (1-2)*, 78–86. DOI: 10.17505/jpor.2016.08.
  http://www.personresearch.ouradmin.se/articles/volume2_1_2/filer/5.pdf