Course title: Quantitative Research Methods: Multivariate Statistics - 6 ECTS

Type of course: Compulsory doctoral programme course

Year of study: 1st or 2nd study year

Semester: II semester (Spring)

Number of credits allocated: 6 ECTS

Name of lecturer: Dr. Samuel Franssens

Language of instruction: English

Course annotation:

This course aims to provide students with the statistical knowledge to interpret quantitative research. The most common analysis techniques will be demonstrated with actual research data. Students will learn to identify the appropriate tests for a given research question and dataset and they will learn how to carry out these techniques in SPSS.

At the end of the course, a doctoral student is expected to be able to:
- Describe and visualize data
- Explain basic concepts of statistics
- Identify the appropriate tests for a given research question and a given set of variables
- Carry out, via SPSS, the most common analysis techniques and accompanying significance tests and to interpret the output
- Find patterns in complex multivariate data

Course learning outcomes (CLO)	Study methods	Evaluation methods
CLO1 Be able to understand and explain basic concepts of statistics	Seminars, individual exercise	Participation in class and submission of final assignment.
CLO3 Be able to identify the appropriate tests for a given research question	Seminars, individual exercise	Participation in class and submission of final assignment.
CLO4 Be able to use SPSS analysis techniques and to interpret the output	Seminars, individual exercise	Participation in class and submission of final assignment.
CLO5 Be able to find patterns in complex multivariate data	Seminars, individual exercise	Participation in class and submission of final assignment.
CLO5 Be able to describe data in research manuscripts	Seminars, individual exercise	Participation in class and submission of final assignment.

Course content:
The course is composed of seminars and exercises which is provided during seminars.

Seminars focus on exploring and describing continuous and discrete data with statistics (frequency, proportion, mean, median, mode, standard deviation, variance, etc.,) and with graphs (histograms, bar plots, etc.,). The relationships between variables (correlation, scatter plots, conditional plots, etc.,) are also described and visualized.

In the course, the idea of sampling from a population to move on to inferential statistics is discussed. It is taught the most important analysis techniques such as t-tests, ANOVA, simple and multiple regression analysis, ANCOVA, chi-square tests, and logistic regression. The concepts of interaction (moderation) are thoroughly being explained.

Teaching methods: Lectures to explain theory and hands-on demonstrations in SPSS. Students will be asked to solve exercises in SPSS. All course material can be found on the e-learning platform http://elearning.ism.lt/ .

Assessment methods: Student performance in this course will be evaluated with one assignment.

During the course students are expected to fulfil following assignments:

Assignment	Value in per cent from the final grade
Data analysis	90 per cent of the final grade
Class participation	10 per cent of the final grade

Description of course assignments

1. Data analysis
The student will be asked to answer some research questions based on a given dataset.

2. Class participation
Students are expected to participate in class in an active way. This requires coming to the class, carrying out the exercises in SPSS, asking questions whenever things are unclear, participating actively in class discussions.

Additional literature:

1. Wackerly, Dennis, William Mendenhall, and Richard L. Scheaffer. *Mathematical statistics with applications*. Cengage Learning, 2014.
2. Spiegelhalter, David. *The art of statistics: learning from data*. Penguin UK, 2019.