Doctoral School on Safety and Security Sciences – Óbuda University

Unit of Study: *Modern statistical methods in Research*

Field of study: *Fundamental Research Topic Subject*

Credits: 6

Lecturer in charge: *Andrea Tick PhD habil.*

Course objectives:

Within the framework of the subject, students receive an overview of the scientifically sound research process, the development of the research plan, the individual research methods and the possibilities of data collection and validation. The aim of the subject is also to present the repository of statistical methods and the procedures that can be applied in research. A great emphasis is placed on meeting the expectations of scientific research in every step of the whole research process, from data collection to the evaluation of the results.

Course prerequisites: *fluent English*

Course description:

Research planning. Primary research methods (experiment, questionnaire survey, focus group research). Secondary research methods. Development of the principles of data collection, examination of data sources (measurement methods and data types, definition of variables), review of sampling procedures, development of rules, procedures (sample size). Settlement of the legal background for data collection (GDPR). Data validation. Types and forms of analysis, methods used for analysis, test methods offered by statistics, application of modern statistical analysis software, univariate, crosstab, ANOVA, factor analysis. Methods and possibilities of correlation and regression calculation, discriminant analysis and logistic regression. Use of computer software specialized in quantitative data analysis, effective application of Power BI, SAS and SPSS in the analysis and evaluation process. Examples, case studies.

Obligatory Literature:

1. Rudolf Freund, Donna Mohr, William Wilson, Statistical Methods 3rd Edition Elsevier, 2010.
2. R. Lyman Ott, Michael T. Longnecker: An Introduction to Statistical Methods & Data Analysis, Cengage Learning Inc, 2016.
3. Parr-Rud, O., Business Analytics Using SAS Enterprise Guide and SAS Enterprise Miner, SAS, 2014
4. A. Field, Discovering Statistics using SPSS, 3rd ed. SAGE, 2009
5. M. Bramer, Principles of Data Mining, 3rd ed. Springer, 2016

Recommended literature:

1. Cody, R., *Biostatistics by Example Using SAS Studio*, SAS, 2016