

Kaposvar University Faculty of Economic Science
Kaposvár, Guba Sándor u. 40.

COURSE DESCRIPTION AND REQUIREMENTS

Course name: Multivariate statistical modelling

Code: 3MNRKG-EA-MULTISTATMOD, 3MNRKG-GY-MULTISTATMOD

Study programme: Regional and Environmental Economics

BA / MA

Form of programme: ***FULL TIME***

Lessons per week: 2 lectures + 2 seminars

Type of evaluation: seminar mark

Course leader: Dr. György Kövér

Teacher: Dr. György Kövér

Department of course: Mathematics and Physics

Head of department: Dr. Eleonóra Stettner, associate professor

2015/2016 spring semester

Objectives of the course:

The aim of this course is to expose the students to a selection of statistical techniques dealing with multivariate data. The statistical computations will be performed using the freeware R software package and SPSS or SAS depending on availability..

Examining

The course ends with a practical course mark. The result of two classroom and one home assignment solved by the students will create the practical course mark in 25-25-50% ratio.

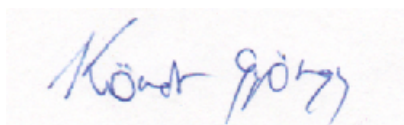
Literature

- lecture materials
- Malhotra, Naresh: Marketing Research, Global Edition, Pearson, 2010
- Everitt, Brian, Hothorn, Torsten: An Introduction to Applied Multivariate Analysis with R (2011) Springer

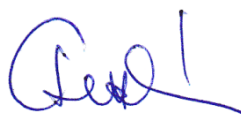
Course thematic:

NO.	THEMES
1.	Brief coverage of the preliminary studies.
2.	Graphical display of the multivariate dataset. Histograms, scatter plots, rotating 3D plots, data transformations
3.	Visualizing multivariate normal distribution. Eigenvalues and eigenvectors of the correlation and covariance matrix. The confidence ellipse. Correlations. Partial correlations
4.	Multiple linear regression. The assumptions of regression. Regression statistics. Anova. Regression coefficients, confidence intervals, hypothesis tests. Diagnostic tests. Non-linear fit. Model selection methods. Detecting multicollinearity, heteroscedasticity and autocorrelation.
5.	One and two way multivariate analysis of variance (MANOVA). Model assumptions. The experiment-wise error problem. The traditional and the Bonferoni confidence intervals.
6.	Discriminant analysis. Linear and quadratic discriminant analysis. Classification a new subject using the discriminant functions. Validation of the discriminant model. Measuring the efficacy of a discriminant model. Model assumptions.
7.	Logistic regression. The odds and odds ratios. The logistic model. Dependent variable. Factors and covariates. Wald statistics. Logistics coefficients and interpretation. Goodness of fit.
8.	Case studies I
9.	Principal component analysis. The main objective is data reduction. Eigenvalues, eigenvectors. The interpretation of the principal components. Performing other statistical methods based on the principal components.
10.	Factor analysis. The factor model. The number of the required factors. The communalities. . The interpretation of the factors. Factor rotation. Factor extraction by principal component, maximum likelihood and principal factor methods. Model assumptions.
11.	Canonical correlation analysis. Canonical variate pairs. Interpretation of the canonical variate scores. The relationship between the variables of the two datasets.
12.	Cluster analysis. Objectives. Measures of distance. Binary variables. Agglomerative and divisive clustering. Cluster description. K-means clustering.
13.	Multidimensional scaling and conjoint analysis.
14.	Case studies II

Kaposvár, 18 January 2016.



Dr. György Kövér
associate prof.



Dr. Eleonóra Stettner
head of dept, ass. prof.