Quantitative Methods - Economics and Management Programme

1. Random quantity. Measures of random quantities. Elementary distributions of a random quantity, alternative, binomial, Poisson, normal, standard normal, uniform, exponential.
2. Elementary measures of descriptive statistics, elements of exploratory data analysis, types of samples,random sampling.
3. Basics of estimation theory - interval estimation of average, of variance, of relative frequency.
4. Statistical hypothesis testing - basic notions, parametric testing.
5. Analysis of variance and the multiple comparison methods.
6. Non-parametric testing procedures.
7. Tests of conformity.
8. Regression and correlation analysis - simple linear regression and correlation, non-linear regression rank correlation.
9. Regression and correlation analysis - multiple regression and correlation.
10. Verbal variables relationships. Testing in the contingency table.
11. Time series. Definitions, grouping, elementary time series measures, decomposition of a time series.
12. Trend analysis of time series, mechanical smoothing, trend function types, selection criteria.
13. Identification and description of the periodic component in time series

14. Linear Programming – model properties, model construction, type of model, solution algorithm, solution analysis and sensitivity analysis
15. Transportation Problem – simple transportation model, solution algorithm, methods for creation of initial solution, transportation problem as linear optimization model
16. Multi-Attribute Decision Making – sequencing method, scoring method, Fuller's method, Saaty's method, Simple additive weighting method with utility, TOPSIS
17. Multiple objective Programming – mathematical model, scalarization (weighting) method, goal programming, ε-constraints method
18. Project Management - project network graphs, critical path methods - CPM and PERT
19. Game Theory - matrix game model, solutions in the field of pure and mixed strategies
20. Input – output model - closed, partially open and open model, basic calculations by the total output and final demand

Doporučená literatura:

Bowerman, Bruce, O´Connell, Richard T. Applied Statistics. IRWIN, Chicago 1997

Dantzig, G. B. Linear Programming and Extensions, Princeton, 1998,648 pp., ISBN 9780691059136

Lindsey, J.K. Introduction to Applied Statistics, a modelling approach. New York, 2004, Oxford University Press, 2nd ed

Rossman, A.J. Workshop Statistics. Springer, New York, Berlin, Heidelberg 1996.

Turban, E., Meredith, J.R. Fundamentals of Management Science. IRWIN 1991. ISBN 0-256-08373-8

Wilcox, Rand R. Fundamentals of Modern Statistical Methods. Springer-Verlag, New York, Berlin, Heidelberg 2001, 258 p.