UNIVERSITY OF PANNONIA

COURSE DATASHEET

Semester:	2015/16/1
Course:	Chemometrics and Data Aquisition
Code:	VEMKKAB412K
Responsible department:	Department of Analytical Chemistry
Department code:	MKKA
Responsible instructor:	dr. Tamás Pap

Course objectives:

Understanding of the fundamentals of chemometrics

Course content:

1. Statistical evaluation of measured data. Theoretical basis. Distribution functions. Statistical moments. 2. Random and systematic errors. Functions of error propagation 3. Test of outliers, t-test, F-test. 4.. Analysis of variance. Techniques for one-way analysis of variance. Two-way analysis of variance. 5. Correlation analysis. Regression analysis. Linear and non-linear regression. 6. Principles of calibration. Modes of calibration. Test for linearity. 7. Experimental design. 2n type factorial design. Simplex method. Latin square design 8.Classification of samples by statistical method. Pattern recognition. Clusteranalysis. Nearest neighbour and k-th nearest neighbour method. 9. Definition of analog and digital signals. Classification of analog signals. The quality of the signal. The signal-to noise ratio. 10. Deterministic and periodic signals. Stationer and random signals. The type of noise and the source of noise. improvement of the quality of analog signal: filtering, modulation. 11. The digitization of the analog signals. Theory of Shannon. Transformation of analog-to-digital (A/D). 12. Examination of the signal-time functions in frequency domain. The Fourier Transform of the continous and discrete signals. 13. Improvement of the digital signal. Smoothing. Method of Savitzky-Golay. 14. Addition of spectra. Smoothing using Fourier-transformation.

Requirements, evaluation and grading:

The topics of the lectures

Required and recommended readings:

Dr. Inczédy János: Folyamatos és automatikus analízis. Műszaki Könyvkiadó, Budapest, 1984.