



## COURSE DATASHEET

<b>Semester:</b>	2012/13/1
<b>Course:</b>	Modern Methods in Environmental Analysis
<b>Code:</b>	VEMKKAB111K
<b>Responsible department:</b>	Department of Analytical Chemistry
<b>Department code:</b>	MKKA
<b>Responsible instructor:</b>	dr. Péter Hajós

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### Course objectives:

An understanding of the principles and environmental applications of modern analytical methods

### Course content:

1. Classification of Environmental Analysis . Basic concepts (chromatography, spectroscopy). Sampling methods, sampling preparation. (complex formation, extraction, ion exchange) 2. Classification of Chromatography (HPLC, GC, EC). Relationships of Retention (selectivity, performance, resolution). Experimental variables . 3. Liquid Chromatography (adsorption, partition, normal- and reversed phase systems). PAH and detergent analysis. 4. Ion-, Ion pair-, and Ion –exclusion chromatography. Analysis of organic and inorganic acids. Water, waste water and acid rain analysis. 5. Gas chromatography. Pesticide analysis. Polychlorinated diphenyls. 6. Electrochromatography (zone- and capillary electrophoresis, isoelectric focusing). Thin-layer chromatography. Amino acid analysis. 7. Detectors for environmental samples. ( ECD, FID, UV, RI, conductivity detectors, sensitivity, detection limit) 8. Atomic spectroscopy for Metal Species. 9. ICP spectroscopy. Trace analysis. 10. Gas-spectroscopy. FT-IR analysis of air pollutants. 11. Thermoanalytical methods. Soil and brine analysis. 12. High performance hyphenated methods (GC-MS, GC-FTIR, HPLC-MS, 2DGC, HPLC-ICP-MS) 13. Speciation. Analysis of metal organic compounds (Pb, Hg,As, Cr) 14. Chemical sensors in environmental analysis. 15. Toxicity. Quality Control Procedures. Risk assessment.

### Requirements, evaluation and grading:

The topics of the lectures

### Required and recommended readings:

D. A. Skoog, J. J. Leary: Principles of Instrumental Analysis, Saunders College Publishing, 1992. J. Lawrence: Liquid Chromatography in Environmental Analysis, Humana Press, 1984. Előadásvázlat és ábrák (80 oldal) fénymásolt változatban a hallgatók rendelkezésére áll.