



SUBJECT DATASHEET

Semester:	2010/11/2
Subject:	Air Pollution Control
Code:	VEMLKVM423L
Responsible department:	Department of Environmental Engineering
Responsible department code:	MKKV
Responsible lecturer:	Tamás Fülöp

Educational objectives:

Earning knowledge about main air pollutants, air quality regulations, possibilities of decreasing air emissions; familiarization with main air pollution control equipments and gas cleaning technologies based on different types of physico-chemical phenomena (e.g. diffusion, coagulation, condensation, adsorption, absorption) and on catalytic processes.

Detailed content of the subject:

1. Lecture: mechanisms affecting the transport of solid and liquid particles, Brownian-motion, diffusion, thermophoresis and diffuziophoresis. 2. Coagulation and condensation theories. 3. Role of transport phenomena in air pollution control techniques. 4. Catalytic processes, mass transfer in gas and solid phase, type of pore diffusion, diffusion restriction, Thiele-module. 5. Hydrodynamic resistance, pressure loss. 6. Physico-chemical backgrounds of emission and immission monitoring. 7. Cost-benefit analysis of air pollution control techniques, process economy. 8. Legislative aspects of air pollution control, tools for complying the obligations of international agreements, Kyoto protocol, flexible mechanisms, situation in Hungary. 9. Field trip 10. Seminars: Kinetics of catalytic reactions, calculation of kinetic constants. 11. Effect of transport processes on the reaction kinetics. 12. Application of numeric algorithms of air pollution control processes. 13. Air pollution control modeling. 14. Cost-benefit analysis of air pollution control techniques, process economy. 15. Greenhouse gas emission control, baseline and project line scenarios.

Requirements:

Written examination during the end-of-semester test period.

Required and suggested references:

Sipos Zoltán: Ipari levegőtisztaság védelem. Műszaki Könyvkiadó, Budapest. 1987. Woperáné, Serédi Ágnes: SO_x és NO_x emisszió csökkentése. Debrecen. 1991. Kenneth E. Noll, Vassilios Gounar: Adsorption Technology, Lewis Publishers, Chelsea, 1992. Godish Thad: Air Pollution, Lewis Publishers, Chelsea, 1991. Ronald M. Heck, Robert J. Farrauto: Catalytic Air Pollution Control, Van Nostrand Reinhold, London, 1995. Seymour Calvert, Herold M. Englund: Handbook of air pollution technology, John Wiley & Sons, New York, 1984