UNIVERSITY OF PANNONIA

SUBJECT DATASHEET

Semester:	2009/10/2
Subject:	Transportphenomena II.
Code:	VEMKMU3212T
Responsible department:	Department of Chemical Engineering Science
Responsible department code:	MKMU
Responsible lecturer:	Dr. János Argyelán

Educational objectives:

Extension of fundamental transport processes, calculation of transport coefficients for special cases, recognition of specific transport phenomena.

Detailed content of the subject:

1. Diffusion and heat conduction in semi-infinite space (static and mooving systems) 2. Component- and heat transfer in finite bodis (Fo, Fo' criteria) 3. Heat and mass transfer in a solid cylinder (heat izolation, membranes) 4. Higbe's penetratios-, filmpenetrations and surface renewal theories 5. Reactive systems with diffusional transport(Ha, Thiele modulus) 6. Diffusion in special circumstances (non-Fickian diffusion, Knudsen transport, Stefan flow) 7. Laminar boundary layers (structure, layers on planare surface, circumflowed bodies, Kármán vortex) 8. Balance equations (component, heat, momentum) for laminar boundary layers 9. The turbulent boundary layers 10. Residence time, diffusion and cascade models 11. Calculation of transport coefficients from molecular-kinetic data 12. Onsager's formalism, cross effects 13. Heat transfer with radiation in the IR region 14. Energy transfer with microwave 15. Case studies

Requirements:

The whole content of lectures are included in the verbal examination.Granding is based on two written midterm examination and the final verbal examination. Every written examination consists of 5 questions. The verbal examination contains two big questions (one from classical component transfer one from special transfers) and timely short questions. The minimal level is the recognition of the essential transport phenomena in concrete cases, and the knowledge of the fundamental transport equations.

Required and suggested references:

Benedek P., László A.: A vegyészmérnöki tudomány alapjai, Szárítási kézikönyv (Szerk. Imre L.) Grúber J., Blahó M.: Folyadékok mechanikája, Szolcsányi P. : Transzportfolyamatok, Bird-, Stewart: Lightfoot: Transportphenomena, Culson, J.M., Richardson, J.F.: Chemical Engineering, Cranc, J.: The Mathemathics of Diffusion, Astarito, G.: Mass Transfer with Chemical Reaction