Course title: Heat and Mass transfer	**Neptun code: GEVT401a**

Course coordinator: Gabor SZEPESI, full professor, PhD

type and number of lesson: 10 lecture per semester

method of accountability: colloquium

curriculum location of the subject: autumn/spring

pre-study conditions:

The task and purpose of the subject:

The aim and task of the subject is for students to gain deeper knowledge in the field of operations related to heat and mass transfer

Course description:

1. Basics of transport equation and transport phenomea
   - driven force for mass, component, energy and momentum
   - Fundamental equation for mass, component, heat and momentum
2. Heat transfer in case of conduction (steady state)
   - Fourier equation for flat plate and cylindrical shell
   - Fourier equation for multiple flat layers
3. Heat conductivity differential equation, and solve with finite difference method. Differential equation for conduction and convection case
4. The fundamental equation of heat exchangers
   - Overall heat transfer coefficient
   - Logarithmic mean temp. difference for co-current and counter flow, F- correction factor for mixed type flows
5. Basics of mass transfer
   - Vapor pressure for pure component, volatility
   - Raoult and Dalton law
   - Batch distillation and Rayleigh-equation
6. Flash distillation, distillation column
   - Balance equation
   - Feed line
   - McCabe-Thiele method
   - Calculation of column diameter

Required literature:

1. Perry- Chemical engineering handbook, 8th ed. Section 5. DOI: 10.1036/0071511288
2. W. Rohsenow, J. Hartnett – Handbook of Heat Transfer ISBN 0-07-053576-0

Recommended literature:

1. Raman Raghu – Chemical process computations, ISBN 0-85334-341-1