

CHEN 3220 - Chemical Engineering Principles 3 (Separations and Mass Transfer)

Textbook: *Separation Process Principles* by Seader and Henley (Wiley)

3 credits engineering topics: three one-hour lectures

Learning Goals

1. Vapor-Liquid Equilibrium

- Skills in graphical means to represent binary equilibrium
- Knowledge and use of analytical (equations) means to represent ideal and nonideal equilibrium

2. Flash Distillation

- Ability to analyze flash distillation problems using graphical methods, analytical methods implemented on spreadsheets, and commercial process simulations such as HYSYS

3. Distillation Column

- Skills in graphical methods for analyzing distillation problems as well as the use of commercial process simulators for the analysis
- Ability to calculate column diameters and tray spacing using commercial simulators for both tray and packed columns

4. Absorption and Extraction

- Ability to analyze absorption and extraction problems graphically and using commercial simulations

5. Mass Transfer Rate Processes

- Understanding of the fundamentals of diffusion
- Ability to develop microscopic material balances for mass transport processes
- Knowledge of definitions and means for correlating mass transfer coefficients

6. Packed Columns

- Ability to apply mass transfer rate theory to the design of packed columns using graphical and commercial simulators

Catalog Description: Study of separation methods including distillation, absorption, and extraction. Graphical and computer based solutions to separation problems. Study of mass transfer rate processes, including diffusion, microscopic material balances and correlations for mass transfer coefficients. Application of mass transfer rate theory to packed and tray columns. Prereq., CHEN 3200.