

CME 401 Separation Technologies I (Required)

Course Instructor: *Dr. Nadine Pernodet*

Website: none

Course Goals:

Fundamentals of separations. Introduction to standard classical and advanced separation methods and their relative merits and limitations. Distillation, crystallization, filtration, centrifugation, absorption and stripping methods. Fundamentals of chromatography. [3 credits]

Pre- or Corequisite(s): U3 or U4 standing in CME, CME 323

Text(s): Separation Process Principles. J.D. Seader and E.J. Henley. John Wiley & Sons, Inc. 1998.

Class/ Laboratory Schedule:

Fall: Lecture, Tuesday/Thursday 9:50-11:10 am

Topics Covered:

Week 1: Fundamentals of separation processes

Week 2: Fundamentals of distillation, distillation tray selection, batch distillation

Week 3: Crystallization: Solid-phase separation of hydrated and anhydrous salts, and sublimation.

Week 4: Zone melting, extractive and melt crystallization

Week 5: Filtration: Separation of micron solids from solid/liquid slurries. Quiz 1

Week 6: Centrifugation: Separation of sub-micron solids from solid/liquid slurries.

Week 7: Fundamentals of Chromatography

Week 8: Review/Mid-term

Week 9: Chromatography: Gas/gas separations

Week 10: Chromatography: Liquid/liquid separations

Week 11: Strategies in proper column selection for separations by chromatography. Quiz 2

Week 12: Separation by Absorption

Week 13: Separation by stripping, predicting equilibrium lines for separation by stripping

Week 14: Introduction to industrial separation problems.

Week 15: Review/Make up/Final Exam

Contribution of course to meet professional component:

Relationship of course to program outcomes:

CTPC "3a-k" Outcomes	% contribution
A. Ability to apply knowledge of math, engineering, and science	30%
B. Ability to design and conduct experiments, analyze data	9%
C. Ability to design system, component or process to meet needs	9%
D. Ability to function on multi-disciplinary teams	
E. Ability to identify, formulate, and solve engineering problems	26%
F. Understanding of professional and ethical responsibility	5%
G. Ability to communicate effectively	5%
H. Broad education	2%
I. Recognition of need and ability to engage in life-long learning	2%
J. Knowledge of contemporary issues	2%
K. Ability to use techniques, skills, and tools in engineering practice	10%
Any other outcomes and assessments?	
	100%

Prepared by _____

Date Prepared: _____