

CHBE 426: Chemical & Biomolecular Separation Processes

Department of Chemical and Biomolecular Engineering
University of Maryland

Course description

This course focuses on separation processes in chemical and biomolecular engineering. Staged and rate-dependent separation processes will be covered, including distillation, gas absorption, liquid extraction, adsorption and ion exchange.

Co-requisites

Students must have received a D or better in or currently be taking CHBE 302 (Chemical and Biomolecular Engineering Thermodynamics II) and CHBE 424 (Chemical and Biomolecular Engineering Transport Phenomena II) in order to be enrolled in CHBE 426.

Instructor

Dr. Amy J. Karlsson

Textbook

The following textbook is required for this course:

J.D. Seader, E.J. Henley, and D.K. Roper. *Separation Process Principles*. 4th ed. Wiley. 2016.

The textbook is available both in softcover and as an E-text, depending on your preference.

Attendance

You are expected to attend all scheduled lecture and discussion periods and are responsible for all material presented.

Lectures

Dr. Karlsson will typically present lecture during the lecture period, though occasionally another qualified person may substitute or a recording may be posted on ELMS. Lectures will be the primary means to deliver new information.

Discussion

The discussion period is an opportunity to strengthen your understanding of course material. The discussion will normally be led by a teaching assistant and/or teaching fellow. Discussion time will be devoted to doing practice problems and example problems, addressing issues in homework assignments (past and current), and reinforcing material from lecture. Graded in-class homework or quizzes may also be assigned during the discussion period.

Weekly lecture topics and activities

The schedule below provides the tentative topics and reading assignments for each week.

Week	Topic(s)	Reading
1	Introduction Single equilibrium stages	Chapter 1 Chapter 4
2	Single equilibrium stages Cascades	Chapter 4 Chapter 5
3	Cascades Absorption and stripping	Chapter 5 Chapter 6
4	Absorption and stripping	Chapter 6
5	Absorption and stripping EXAM I	Chapter 6
6	Binary distillation	Chapter 7
7	Binary distillation	Chapter 7
8	Binary distillation Multicomponent distillation	
9	Multicomponent distillation EXAM II Project assigned	Chapter 9
10	Additional distillation methods Liquid-liquid extraction	Chapters 11, 13 Chapters 4, 8
11	Liquid-liquid extraction Membrane separations	Chapter 8 Chapter 14
12	Membrane separations Adsorption, ion exchange, chromatography Project due	Chapter 14 Chapter 15
13	Adsorption, ion exchange, chromatography EXAM III	Chapter 15
14	Bioseparations	TBA
15	Bioseparations	TBA
	FINAL EXAM	