Chemical Engineering 150B
Transport and Separation Processes
Fall Semester 2019
Course Website: http://bcourses.berkeley.edu

Instructor: Alexis T. Bell (107 Gilman Hall, 642-1536, bell@cchem.berkeley.edu)
Office Hours: Tu 2:00–3:00 pm, Th 1:00–2:00 pm in 109 Gilman

Teaching Assistants: Justin Bui (justin_bui@berkeley.edu)
Office Hours: Mon 12:00-1:00 pm – 295 Tan Hall
Wed 1:00-2:00 pm – 100E Hildebrand Hall
John Petrovick (jpetrovick@berkeley.edu)
Office Hours: Wed 3:00-4:00 pm – 100E Hildebrand Hall
Fri 9:00-10:00 am – 100E Hildebrand Hall
Nicholas Ouassil (ouassil@berkeley.edu)
Office Hours: Mon 4:00-5:00 pm – 100E Hildebrand Hall
Fri 3:00-4:00 pm – 100E Hildebrand Hall

Discussion Sections: Discussion Sec. 101: M, 3 pm-4 pm, 180 Tan Hall
Discussion Sec. 102: Tu, 11 am-12 pm, 289 Cory Hall
Discussion Sec. 103: Th, 11-12 pm, 289 Cory Hall
Discussion Sec. 104: F, 1 pm-2 pm, 200 Wheeler Hall

Lecture Hours: MWF, 2:00 pm – 3:00 pm, 100 Genetics and Plant Biology Bldg. (GPB)

Texts: J. R. Welty, C. E. Wicks, R. E. Wilson, G. Rorrer, Fundamentals of Momentum, Heat, and Mass Transfer, Fifth Edition, John Wiley & Sons, Hoboken, NJ, 2008.

J. D. Seader, E. J. Henley, and D. K. Roper, Separation Process Principles, Second Edition, John Wiley & Sons, Hoboken, NJ, 2006 or Third Edition, 2010.

Course Grade: The course grade will be determined by the following:

Homework:	10%	
Midterm Exam 1:	25%	(October 9)
Midterm Exam 2:	25%	(November 15)
Final Examination:	40%	

Homework: Homework will be assigned on Wednesdays and will be due by noon on the following Wednesday, unless indicated otherwise. Four to five problems will be assigned each week. Solutions will be posted on the class website. The homework should be scanned and submitted through bCourses as a .pdf file. Free scanning is available through all Berkeley libraries, including Hildebrand library (see http://www.lib.berkeley.edu/using-the-libraries/print-scan). Alternatively, you may use Evernote Scannable, a free scanning app for iPhone and Android. Please contact the GSIs if you have any trouble

Computer Use: Students will be expected to use computers to solve some of the homework assignments. To this end, the computers in the Chevron Facility in Tan Hall are equipped with Matlab and other generalized equation solvers. The entire class will have one login to access all computers in the lab. Each student will have a printing credit of 200 pages per student.

Grading Policies:

1. Homework must be turned in at the designated time. Late problem sets will be corrected but assigned a score of zero.
2. Students should feel free to discuss the homework assignment with others; however, **the final product must be entirely your own work**.
3. Requests for homework regrades can be made at the end of the course and will be taken into consideration when determining the final course grade.
4. Exams will not be given early or late. If you miss an exam for a valid reason, your scores from other exams will be averaged to make up for the missed exam. Missing more than one exam will result in either an I or an F grade for the course. Missing an exam without a valid reason will result in a zero grade for that exam. Requests for exam regrades, if approved, will require the entire exam to be regraded (select portions will not be regraded).

References:

Students may find additional reference material in the library helpful for either offering an alternative explanation of course material already in the textbook or more a more in-depth discussion of certain aspects of this material.

A more specialized text dealing with mass transport is:
E. L. Cussler, Diffusion: Mass Transfer in Fluid Systems, Second Edition, Cambridge University Press, Cambridge, United Kingdom.
Chemistry Library TP 156.D47.C878 1997 Reference

A text with good discussion of unit operations for separations and their design is (students may find this text less specialized than the Seader and Henley text for many aspects):
R. E. Treybal, Mass-Transfer Operations, Third Edition, McGraw-Hill Book Company, New York.
Course Reserves Section in Chemistry Library TP156.M3.T7 1980

A text with good discussion of unit operations in general is:
C. J. Geankoplis, Transport Processes and Separation Process Principles (Including Unit Operations), Fourth Edition, Prentice Hall, Upper Saddle River, New Jersey.
Chemistry Library TP156.T7.G4 2003 Reference

Alternative discussion on separations and mass transport can be found in:
A.L. Hines and R. N. Maddox, Mass Transfer: Fundamentals and Applications, 1985, Prentice Hall, Upper Saddle River, New Jersey.
Course Reserves Section in Chemistry Library TP 156.M3.H55 1985

Fall Semester 2018 Class Schedule

Date	Lecture Nº	Topic	Chapter
08/28	1	Fundamentals of Mass Transfer	24 in W^3R
08/30	2	Differential Equations of Mass Transfer	25 in W^3R
09/02	--	Labor Day Holiday	--
09/04	3	Diffusion Coefficients	24 in W^3R
09/06	4	Steady-State Molecular Diffusion	26 in W^3R*
09/09	5	Steady-State Molecular Diffusion	26 in W^3R
09/11	6	Steady-State Molecular Diffusion	26 in W^3R*
09/13	7	Unsteady-State Molecular Diffusion	27 in W^3R
09/16	8	Unsteady-State Molecular Diffusion	27 in W^3R
09/18	9	Convective Mass Transfer	28 in W^3R *
09/20	10	Convective Mass Transfer	28 in W^3R
09/23	11	Convective Mass Transfer	28 in W^3R
09/25	12	Convective Mass Transfer between Phases	29 in W^3R *
09/27	13	Convective Mass Transfer between Phases	30 in W^3R
09/30	14	Simultaneous Heat and Mass Transfer	26 in W^3R
10/02	15	Simultaneous Heat and Mass Transfer	26 in W^3R *
10/04	16	Separation Processes	1 in SH
10/07	17	Thermodynamics of Separation Processes	2 in SH
10/09	--	First Midterm Examination	--
10/11	18	Thermodynamics of Separation Processes	2 in SH
10/14	19	Single Equilibrium Stages and Flash Calculations	4 in SH*

Date	Lecture Nº	Topic	Chapter
10/16	20	Single Equilibrium Stages and Flash Calculations	4 in SH
10/18	21	Absorption and Stripping Operations	6 in SH
10/21	22	Absorption and Stripping Operations	6 in SH*
10/23	23	Absorption and Stripping Operations	6 in SH
10/25	24	Distillation of Binary Mixtures	7 in SH
10/28	25	Distillation of Binary Mixtures	7 in SH*
10/30	26	Distillation of Binary Mixtures	7 in SH
11/01	27	Distillation of Binary Mixtures	7 in SH†
11/04	28	Liquid-Liquid Extraction	8 in SH*†
11/06	29	Liquid-Liquid Extraction	8 in SH
11/08	30	Liquid-Liquid Extraction	8 in SH
11/11	--	Administrative Holiday	-- *
11/13	31	Equilibrium-Based Multicomponent Separations	10 in SH*†
11/15	--	Second Midterm Examination	--
11/18	32	Equilibrium-Based Multicomponent Separations	10 in SH
11/20	33	Equilibrium-Based Multicomponent Separations	10 in SH
11/22	34	Membrane Separations	14 in SH
11/25	35	Membrane Separations	14 in SH*
11/27	--	Non-Instructional Day	--
11/29	--	Administrative Holiday	--
12/02	36	Adsorption	15 in SH
12/04	37	Adsorption	15 in SH*

Date	Lecture Nº	Topic	Chapter
12/06	38	Course Review	--
12/09	-	Reading Review and Recitation	--
12/11	-	Reading Review and Recitation	--
12/13	-	Reading Review and Recitation	--

***** Indicates homework is due on this day
† Indicates instructor will be out-of-town