Chemical Engineering 150B
Transport and Separation Processes
Fall Semester 2014
Course Website: https://bcourses.berkeley.edu/courses/1268987

Instructor: Henrik Wallman (201A Hildebrand, wallman@berkeley.edu)
Office Hours: M 9-10 am, F 9-10 am & by appointment

Teaching Assistants: Efrem Braun (efrem.braun@berkeley.edu)
Discussion M 5-6 pm Office Hours: W 1:30-3:30 pm, 201 Hildebrand
Meron Tesfaye (mtesfaye@berkeley.edu)
Discussion F 1-2 pm Office Hours: Tu 1:30-3:30 pm, 201 Hildebrand
Ksenia Timochova (ktimochova@berkeley.edu)
Discussion Th 2-3 pm Office Hours: Th 12:00-2:00 pm, 201 Hildebrand
Sara Renfrew (renfrew@berkeley.edu)
Discussion W 12-1 pm Office Hours: Th 12:30-2:30 pm, 201 Hildebrand

Discussion Sections: First Discussion (Sec. 101): M, 5:00 – 6:00 pm, 2 Evans Hall
Second Discussion (Sec. 102): W, 12:00 – 1:00 pm, 2 Evans Hall
Third Discussion (Sec 103): Th, 2:00 – 3:00 pm, 9 Evans Hall
Fourth Discussion (Sec 104): F, 1:00 – 2:00 pm, 75 Evans Hall

Lecture Hours: MWF, 8:00 – 9:00 am, 50 Birge

Text: C. J. Geankoplis, Transport Processes and Separation Process Principles (Including Unit Operations), Fourth Edition, Prentice Hall, Upper Saddle River, New Jersey. Third edition has the same chapters and sections but lacks some new material on separation processes (covered in Seader&Henley)
Chemistry Library TP156.T7.G4 2003 Reference

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

Homework&Discussion:	15%
Midterm Exam 1:	25%
Midterm Exam 2:	25%
Final Examination:	35%

Homework: Homework will be assigned on Fridays and will be due at the beginning of lecture on the following Friday, unless indicated otherwise. Solutions will be posted on the class website.

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 Comsol 4.3b and other process simulation software. 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. Comsol can also be loaded on student owned computers and used under the CBE license server using a campus VPN connection.

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.

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

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

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 2014 Class Schedule

Date	Lecture Nº	Topic	Chapter
8/29	1	Introduction to interface mass transfer	7.1C in G
9/3	--	Labor Day Holiday	--
9/5	2	Principles of Mass Transfer	6.1 in G
9/8	3	Differential Equations of Mass Transfer	7.5A, B &C in G
9/10	4	Boundary-Layer Mass Transfer	7.9A in G
9/12	5	Steady-State Molecular Diffusion	6 in G
9/15	6	Steady-State Molecular Diffusion	6 in G
9/17	7	Unsteady-State Molecular Diffusion	7 in G
9/19	8	Unsteady-State Molecular Diffusion	7 in G
9/22	9	Convective Mass Transfer	7 in G
9/24	10	Convective Mass Transfer	7 in G
9/26	11	Convective Mass Transfer between Phases	7 in G
9/29	12	Convective Mass Transfer between Phases	7 in G
10/1	13	Mass transfer to Catalytic Surface	7.5D in G
10/3	14	Mass transfer to Catalytic Surface	7.5D in G
10/6	15	Simultaneous Heat and Mass Transfer	(26.4 in W^3R)
10/8	16	Introduction to Separation Processes	
10/10	--	First Midterm Examination	--
10/13	17	Gas-Liquid Separation Processes	10 in G
10/15	18	Gas-Liquid Separation Processes	10 in G
10/17	19	Gas-Liquid Separation Processes	10 in G

Date	Lecture N^o	Topic	Chapter
10/20	20	Gas-Liquid Separation Processes	10 in G
10/22	21	Vapor-Liquid Separation Processes	11 in G
10/24	22	Vapor-Liquid Separation Processes	11 in G †
10/27	23	Vapor-Liquid Separation Processes	11 in G
10/29	24	Vapor-Liquid Separation Processes	11 in G
10/31	25	Vapor-Liquid Separation Processes	11 in G
11/03	26	Fluid-Solid Separation Processes	12 in G
11/05	27	Fluid-Solid Separation Processes	12 in G
11/07	--	Second Midterm Examination	--
11/10	28	Fluid-Solid Separation Processes	12 in G
11/12	29	Fluid-Solid Separation Processes	12 in G
11/14	30	Liquid-Liquid Extraction	12 in G
11/17	31	Liquid-Liquid Extraction	12 in G
11/19	32	Liquid-Liquid Extraction	12 in G
11/21	33	Membrane Separation Processes	13 in G
11/24	34	Membrane Separation Processes	13 in G
11/26	35	Membrane Separation Processes	13 in G
11/28	--	Thanksgiving Holiday	
11/29	36	Membrane Separation Processes	13 in G
12/01	37	Drying of Process Materials	9 in G
12/03	38	Drying of Process Materials	9 in G

Date	Lecture N^o	Topic	Chapter
12/05	39	Drying of Process Materials	9 in G
12/09	-	Reading Review and Recitation	--
12/11	-	Reading Review and Recitation	--
12/13	-	Reading Review and Recitation	--
12/15	7-10 pm	Final	