

CHE 320
Introductory Transport Phenomena
Spring, 2003
MWF, 8:50-9:40 AM, Engr. Hall 2535

Instructor

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Teaching Assistants

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Textbook

Transport Phenomena, 2nd ed., by Bird, Stewart, and Lightfoot, Wiley, New York (2002).

Exams and homework

There will be three one hour exams and a final, on the dates noted in the syllabus. The lowest exam grade (normalized with respect to the mean for that exam) will be dropped, and replaced with the next lowest normalized score. There will be no makeup exams. Homework will be given every week, and consist of two parts. Part A is to be completed during the problem session, and handed in at the end of the session. Part B will be given out at the end of the problem session and will be due the following week at the beginning of the session. Late homework will be penalized 20% per day and will not be accepted more than two days late.

Course grades will be determined as follows:

Homework	15 %
In-class exams	20 % each
Final exam	25 %

Tentative Syllabus

Note: numbers designate one-hour lectures; P denotes a problem session.

Period	Date	Topic	Reading Assignment
1	1/22	Introduction, viscosity	Ch. 0, 1.1, 1.3, 1.4
2	1/24	Viscosity, momentum flux	Appendix A, 1.2, 1.7
3	1/27	Momentum flux	1.7
P		<i>Math review</i>	Appendix A.1, A.2, A.7
4	1/29	Momentum balances, falling film	2.1, 2.2
5	1/31	Flow in a tube	2.3
6	2/3	Mass conservation	3.1
P		<i>Shell momentum balances</i>	
7	2/5	Equation of motion	3.2, 3.3, 3.5
8	2/7	Dimensional analysis	3.7
9	2/10	Solution of flow problems	3.6
P		Equations of change	
10	2/12	Flow around a sphere	2.6
11	2/14	Turbulent momentum transport	5.1-5.5
12	2/17	Friction factors (tubes)	6.1, 6.2
P		<i>Solution of flow problems</i>	
13	2/19	Friction factors (spheres)	6.3
14	2/21	Exam I , Chs. 0-3	
15	2/24	Macroscopic balances	7.1, 7.2, 7.4
P		<i>Friction factors</i>	
16	2/26	Viscous losses	7.5
17	2/28	Solution of flow problems	7.6
18	3/3	Energy flux, heat conduction	9.1, 9.3, 9.5, 9.7, 10.1
P		<i>Macroscopic balances</i>	
19	3/5	Conduction with heat sources	10.2, 10.4, 10.5
20	3/7	Composites, fins	10.6, 10.7
21	3/10	Forced convection heat transfer	10.8
P		<i>Shell energy balances</i>	
22	3/12	Free convection heat transfer	10.9
23	3/14	Equations of energy and motion	11.1-11.3
24	3/24	Dimensional analysis	11.5
P		<i>Shell energy balances</i>	
25	3/26	Solutions of heat transfer problems	11.4
26	3/28	Heat transfer coefficients	14.1
27	3/31	Heat transfer in tube flow	14.2, 14.3
P		<i>Equations of change</i>	
28	4/2	Heat transfer around objects	14.4
29	4/4	Exam II , Chs. 5, 6, 7, 9, 11	
30	4/7	Macroscopic balances	15.1-15.3
P		<i>Heat transfer coefficients</i>	
31	4/9	Solutions of heat transfer problems	15.4
	4/11	NO CLASS- EXPO	

Period	Date	Topic	Reading Assignment
32	4/14	Radiant heat transfer	16.1-16.4
P		<i>Macroscopic balances</i>	
33	4/16	Diffusion	17.1, 17.3-17.5
34	4/18	Species balance. Diffusion through a gas film	18.1-18.2
35	4/21	Diffusion with reactions	18.3-18.5
P		<i>Diffusion</i>	
36	4/23	Species conservation equations	19.1-19.3, 19.5
37	4/25	Simultaneous heat and mass transfer	19.4
38	4/28	Exam III , Chs. 14, 16, 17, 18	
P		<i>Mass transfer problems</i>	
39	4/30	Mass transfer coefficients	22.1-22.4
40	5/2	Macroscopic balances	23.1, 23.3-23.5
41	5/5	Special topic	
42	5/7	Special topic	
43	5/9	Special topic	

FINAL EXAMINATION

Sunday (!), May 11, 7:25 pm

ROOM T.B.A