ChE 110
Introduction to Chemical Engineering
Spring, 2009

Washington State University
Gene & Linda Voiland School of
Chemical Engineering and Bioengineering
Prof. Bernard J. Van Wie

Text: Elementary Principles of Chemical Processes, 3rd ed, R. M. Felder & R.W. Rousseau, Wiley & Sons, Inc., New York, 2005, ISBN 0-471-68757-X (includes CD and workbook).

Office Hours: TA Bong-Jae Park ETRL 349 Tu 4-5:30p; Th 3-4p; bongjaepark@hotmail.com
Prof. Van Wie Fri 11a – 12p; or by e-mail bvanwie@che.wsu.edu, or appointment

Course Objectives: At the completion of this course you should be able to:
1) know how chemical engineering differs from the other major engineering disciplines
2) be familiar with the vocabulary of the discipline
3) be familiar with a variety of systems of units and be able to convert from one to another
4) convert written descriptions of processes into a graphical form (flowcharts)
5) derive material and energy balances from either written process descriptions or flowcharts
6) perform degree of freedom analyses to assess if sufficient information exists for a problem
7) use a variety of computerized packages to solve material and energy balances

Course Syllabus:
Introduction (1 lecture)
Characteristics of Engineering Disciplines (~6 lectures)
Learning Styles (1 lecture)
Use of Computer Tools (Excel, MathCAD, HYSYS) (3 lectures)
Material Balances/Degree of Freedom Analysis (~4 lectures)
Problem Solving Skills (~4 Lectures)
Energy Balances (~4 Lectures & Hands-on Sessions)
Exams and Reviews (4 Periods)
Assessment Periods (~2 Periods)

Policies and Procedures:
1) There will be two exams in this class. All exams will be open book, open notes exams. Each exam will be given equal weight in determining the class grade. The tests will be graded on a mastery basis – no curving. Thus it is possible for everyone in the class to get an "A", or a "C".

2) No make-up exams will be given except for legitimate medical excuses.

3) During this class we will use a number of software packages, including Excel, MathCAD, and HYSYS. Tutorial classes covering the basics of the software to be used may be arranged.

4) Homework assignments are due at the start of the class period that they are supposed to be turned-in. Any questions about the homework will be addressed after their submission.

5) The grade for the course will be determined as follows: homework – 30%, two exams – 70%,

Department Programmatic Objectives Met:
1) use their engineering skills within the context of a strong, fundamental general education (ABET – h, j)
2) use the fundamentals of the life and physical sciences (ABET – a, AIChE – 1)
3) apply a fundamental knowledge, and practical understanding, of chemical engineering principles (ABET – a, c, k, AIChE – 2,7,9)

Software Usage: Excel, MathCAD, HYSYS

ChE 110
Introduction to Chemical Engineering
Spring, 2009

Washington State University
Gene & Linda Voiland School of
Chemical Engineering and Bioengineering
Prof. Bernard J. Van Wie

Class Schedule: The following table contains the topics for discussion, reading assignments, homework assignments and homework solutions for the ChE 110 – Introduction to Chemical Engineering class. To access the solution to homework problems click on the problem assignment when it is highlighted. The homework assignments are due *AT THE START OF CLASS* on the day they are indicated as being due. Similarly the reading assignments are to be completed before the class meets on the days indicated.

Date	Discussion Topic	Reading	Homework
1/12	Introduction	- -	- -
1/14	Welcome to ChE – Dir. J.N. Petersen	p. 3 – 13	- -
1/19	*No Class (MLK Day)*	- -	- -
1/21	Units		- -
1/26	Sig. Figures, dimensionless numbers	p. 13 - 20	Prob. 2.2, 2.5
1/28	History of ChE – Assoc. Dir. R.L. Zollars	- -	- -
2/2	Intro to EECS – Carl Wells 5-2197	- -	Assignment #2†
2/4	Intro to BE – Anita Vasavada	- -	- -
2/9	Equation Solving (Excel)	p. 20 - 31	
2/11	Intro to CEE – Shane Brown 5-9578	- -	Prob. 2.20
2/16	*No Class (President's Day)*	- -	- -
2/18	ChE Diffusion – Neil Ivory 5-7716	- -	Prob.2.38
2/23	ChE Diffusion – Neil Ivory 5-7716	- -	
2/25	Mass, volume, flow rate, density, composition	p. 42 - 54	Assignment #5
3/4	Pressure, temperature		Prob. 3.3, 3.13
3/9	Intro to MME – Prashanta Dutta 5-7989	p. 54 - 63	Prob. 3.32, 3.48
3/11	**Exam #1**	- -	
3/16,18	*Spring Break*		
3/23	Flow measurement, Dimensionless No. - DLM	p. 20 -22; 45 - 47	Prob. 3.40
3/25	MathCAD/Excel	**Mathcad & Excel Handouts**	Prob. 2.23, 3.43
3/30	Process Flow Diagrams	HYSYS Handout	Prob. 3.31, 3.47
4/1	HYSYS	HYSYS Handout	Prob. 4.5
4/6	Material Balances	pp 83-104; 101-102*	**Distillation Tutorial**
4/8	The Current Energy Situation – Su Ha		Prob. 4.3
4/13	Energy Balances - DLM	p.313 – 337	Prob. 4.9
4/15	Guest Lecture – Haluk Beyenal	- -	Worksheet
4/20	Recycle-Purge	p. 110 – 116	Assignment #16
4/22	**Exam II**	- -	
4/27	Class Wrap-up	- -	
4/29	Course Assessment		Prob. 4.36

* very important

†Some important websites for finding answers: http://www.pafko.com/history/; http://webbook.nist.gov/chemistry/; http://www.simetric.co.uk; http://www.aiche.org; http://www.aiche.org/SBE