202413 Chemical Engineering Plant Design
Course Syllabus

Instructor: Asst. Prof. Dr. Siripon Anantawaraskul
Department of Chemical Engineering
Faculty of Engineering, Kasetsart University
E-mail: fengsia@ku.ac.th

Lecture hour:	Sec 1	M Th 13.00-14.30	E1508
	Sec400	M Th 14.30-16.00	E1508

Course description

Plant design project; process design; general design and economic considerations; design report; material selection and fabrication method; material transfer and handling; heat and mass transfer operation; optimum design; process integration; heat exchanger network.

Course objectives

- To understand steps and general considerations involving in process and equipment design
- To gain experience in solving open-end problems, specifically plant and equipment design problems
- To understand the principle of process integration and design of heat exchanger network

Course outline

- Design project and design report
- Overview of plant design concepts
- General design considerations
- Process design development
- Equipment design
- Introduction to process integration
- Energy target
- Cost target
- Design of heat exchanger network

Method

Lecture, self-study, design project, team based learning, group discussion, written and oral reports

Assignment Submission

Late report will not be accepted. Only professional works (typed or with clear handwriting) will be accepted. Assignment report should be prepared using A4 paper. The discussion is encouraged, but plagiarism will lead to a serious consequence.

Lecture tools

Overhead projector, whiteboard, lecture note, and handout

Course Marking Scheme

Midterm exam (Friday 7 August 2009, 8.00-11.00)	25%
Final exam (Friday 2 October 2009, 13.00-16.00)	25%
Design project	50%

Course evaluation (Tentative)

Summation of adjusted marks will be used to evaluate students' performance.

A	= 80+	B+	= 75-79.9
B	= 70-74.9	C+	= 65-69.9
C	= 60-64.9	D+	= 55-59.9
D	= 50-54.9	F	< 50-

Office hour

Office: 1409-B
Office hours: M 9-10.30 and Tu 10.30-12.00
E-mail: fengsia@ku.ac.th

Main references

1. Max S. Peters, Klaus D. Timmerhaus, and Ronald E. West, "Plant Design and Economics for Chemical Engineers", 5th edition, 2003.
2. Robin Smith, "Chemical Process: Design and Integration", 2005.

Tentative schedule

Week	Lecture	Chapter in Ref 1	Chapter in Ref 2
1	Course introduction Design project and design report	1, 11	1
2-3	Overview of plant design concepts	1, 6	1-3
4-5	General design considerations	2	25-27
6	Process design development	3-5	29
7-8	Equipment selection and design	10, 12-15	8-10, 15
9	Midterm exam (Friday 7 August 2009)		
10	Introduction to process integration	9	16
11-12	Energy target	9	16
13-14	Cost target and process changes	9	17
15	Design of heat exchanger network	9	18-19
16	Remark and discussion		
17	Final exam (Friday 2 October 2009)		

*No class during 6-13 July (APST1 Conference) and 28-31 July (KU convocation)

SUGGESTIONS FOR FURTHER READING

- Warren D. Seider, J.D. Seader, and Daniel R. Lewin, "Product and Process Design Principle", 2nd edition, 2004
- James M. Douglas, "Conceptual Design of Chemical Processes", 1988.
- Ernest E. Ludwig, "Applied Process Design for Chemical and Petrochemical Plants", 3rd edition, 1995.
- Lorenz T. Biegler, E. Ignacio Grossmann, and Arthur W. Westerberg, "Systematic Methods of Chemical Process Design", 1997.
- Stanley M. Walas, "Chemical Process Equipment", 1990.
- Donald R. Woods, "Process Design and Engineering Practice", 1995.
- Jacob A. Moulin, Michiel Makkee, Annelies Van Diepen, "Chemical Process Technology", 2001.

Asst Prof. Dr. Siripon Anantawaraskul