

COURSE PROFILE

Course Name & No.: Chemical Process control CHE-442

Credit Hours & Term: 4 : 3 & 2 Every Fall

Prerequisite : ChE – 321 Chemical Reaction Engineering
ChE – 334 Separation Process
EE -332 Numerical Methods

Instructor : **Dr. AbdulRahim Al-Zahrani**

Time &Room # : 11:00- 12:20 .S.M.
11: 00 -2:00 ...W. (Lab.)
Bldg. 45, Room 120

Goals This course is designed to give a chemical engineering student the fundamental principles of automatic control and how they can be applied to chemical engineering processes.

Text Book: 1) Chemical Process Control by G. Stephanouelos, 1980.

Reference Books: 1- Process Modeling, Simulation and Control for Chemical Engineers (2nd edition) by W. L. LuybenA.,1990.
2- Process Dynamic and Control, by D. Seborg, T. F. Edgar and D. A. Mellichamp, 1989.
3- Principles and Practice of Automatic Process Control C. A. Smith and A. B. Corripio, 1984.

Grade Distribution:	Home work, Quizzes	15%
	Laboratory	10%
	Design Project	15%
	Major Exams (2)	35%
	Final Exam	25%

Faculty of Engineering
Chemical & Materials Eng. Dept.

ChE 442 Chemical process control

Fall 2003

Course Outline

Week	Topics to be covered
1	Incentive for chemical process control Hardware for a process control system
2	Design aspect of a process control system
3	Development of a mathematical model Modeling considerations for control purpose Quiz #1
4	Computer simulation Linearization of nonlinear systems
5	Solution of linear differential equations using Laplace Transforms Transfer functions and the input-output models
6	Dynamic behavior of first-order systems Dynamic behavior of second-order systems Dynamic behavior of higher-order systems Quiz # 2
7	Introduction to feedback control Dynamic behavior of feedback-controlled processes Exam # 1
8	Stability analysis of feedback systems
9	Design of feedback controllers
10	Design of feedback controllers
11	Frequency response analysis of linear processes Exam # 2
12	Design of feedback control systems using frequency response techniques
13	Design of feedback control systems using frequency response techniques
14	Analysis and design of advanced control systems
15	Discrete-Time Systems
16	Final