

CHE 405 Chemical Engineering Laboratory 3

Date: 3 December 2005

Instructor: Emadadeen M. Ali

Total credits: 2 Lecture Cr: 0 Lab Cr: 4 Tutorial Cr: 0

Pre Req(s):

Co Req(s): CHE 323

Contribution to professional component:

Math and Basic science Cr: 1

Engineering Cr: 2

General Education Cr: 0

Catalog Data:

Conducting 6-8 lab experiments focusing on the fundamental concepts taught in the process control course that emphasize the concept of steady and dynamic operations, investigating the dynamic characteristics of chemical processes, and designing a PID controller

Textbook: Lab Manual

Topics covered

Exp1A: Open-loop dynamic of two interacting storage tanks

Exp1B: Open-loop dynamics of temperature sensors

Exp2: Open-loop dynamic of three stirred tanks in series

Exp3: Open-loop response of tank pressure to step disturbances

Exp4: Determination of PID Settings for Level Control System

Exp5: Level automatic control with outflow

Exp6: Temperature Control System (Test I)

Objectives

	a	b	c	d	e	f	g	h	i	j	k		L	M
1. Ability to design experiments		2	2											
2. Ability to run experiment and collect data		2	2								1			2
3. Ability to analyze and discuss the resulted data	2				2						2			
4. Ability to write a technical report	2				2									2
5. Ability to present the experiment objectives, results and conclusions orally						1	2				1		1	
6. Ability to characterize the open-loop dynamics of storage tanks, temperature sensors, and three tanks in series.	2	2	2		2						1			2
7. Ability to characterize the open-loop dynamics of gas-pressurized tank	2	2	2		2						1			2
8. Ability to utilize lab data to determine the best PID tuning parameters	2	2	2		2						1			2
9. Ability to design the temperature control system of a heat exchanger	2	2	2		2						1			2
10. To understand and analyze the feedback control of a tank level	2	2	2		2						1			2

a-k: ABET criteria; Key: 3 : strong 2: moderate 1: week