MUTAH UNIVERSITY
Faculty of Engineering
Department of Chemical Engineering

Process Dynamics and Control Lab

COURSE SYLLABUS

Course Code	Course Name	Credits	Contact Hours
0404564	**Process Dynamics and Control Lab**	**1**	**To be determined later**

INSTRUCTOR/COORDINATOR	
Name	**Dr. Salah Aljbour**
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Website	

TEXTBOOK
George Stephanopoulos, Chemical Process Control: An Introduction to Theory and Practice 1st Edition
Other Supplemental Materials
Luyben W.L., Process Modeling, Simulation, and Control for Chemical Engineering, McGraw-Hill (1998).

SPECIFIC COURSE INFORMATION
A. Brief Description of the Content of the Course (Catalog Description)
This laboratory aims to enable the student to apply theoretical knowledge related to temperature dynamics in the heat exchanger and its control, fluid level dynamics in the tank and its control, pH dynamics in the continuously stirred tank reactor and its control, Controller Tuning.
B. Pre-requisites (P) or Co-requisites (C)
(P): 0404563 (Process Dynamics and Control)
C. Course Type (Required or Elective)
Required (Compulsory department course)

SPECIFIC GOALS

A. Specific Outcomes of Instruction

By the end of this lab, the student should be able to:

1. identify the dynamics of chemical processes and operations under servo- and load-conditions (**SLO-6**).
2- identify the piping and instrumentation for several chemical processes and operations (**SLO-6**)
3- Apply Cohen-Coon and Z-N procedure for controller tuning (**SLO-6**).
4- write detailed report containing all elements of a laboratory report (**SLO-3, SLO-5 and SLO-6**).
5- Collect, analyze and present data related to process dynamics and control (**SLO-3, SLO-5 and SLO-6**)

B. Student Outcomes Addressed by the Course

1	2	3	4	5	6	7				
		✓		✓	✓					

BRIEF LIST OF TOPICS TO BE COVERED

List of Topics	No. of Weeks	Contact Hours
1. Lab Orientation and Safety Procedure	1	3 hrs/lab
2. Pneumatics valves	1	3 hrs/lab
3. Open loop level dynamic in a tank	1	3 hrs/lab
4. Open loop pH dynamic in a mixed reactor	1	3 hrs/lab
5. Temperature dynamic and control in a plate heat exchanger	1	3 hrs/lab
6. Pressure dynamic and control in a pressurized vessel	1	3 hrs/lab
Midterm Exam	1	3 hrs/lab
7. Closed loop level dynamic and control in a tank (P-action)	1	3 hrs/lab
8. Closed loop level dynamic and control in a tank (PI-actions)	1	3 hrs/lab
9. Close loop pH dynamic and control in a mixed reactor (P-action)	1	3 hrs/lab
10. Close loop pH dynamic and control in a mixed reactor (PI-actions)	1	3 hrs/lab
11. Close loop pH dynamic and control in a mixed reactor (PID-actions)	1	3 hrs/lab
12. Controller Tuning using Ziegler-Nicolas Procedure	1	3 hrs/lab
Final Examination	1	3 hrs/lab
Total	14	42 hrs

METHODS OF ASSESSMENT

No.	Method of assessment	Week and Date	%

1	Midterm Exam	7th week	**20**
3	Reports	Homework/week	**40**
4	Final Exam	The 14th week	**40**
Total			**100**