LESSON PLAN - CHE624 **PROCESS CONTROL & INSTRUMENTATION**	**FACULTY OF CHEMICAL ENGINEERING UNIVERSITI TEKNOLOGI MARA**

1.0 COURSE INFORMATION

COURSE NAME	:	PROCESS CONTROL & INSTRUMENTATIONS
COURSE CODE	:	CHE 624
PROGRAM	:	EH220
SEMESTER	:	5
CREDIT HOURS	:	4
CONTACT HOURS	:	7
COURSE STATUS	:	CORE
PRE-REQUISITE	:	NIL

2.0 SYNOPSIS

This course begins with a discussion of control theory, concept, terminologies, and system. It moves on to discuss the product hardware and software that implement the theory, and then proceeds to describe instrumentation examples and the system-design approaches suitable for variety of production processes.

3.0 OBJECTIVES

Upon completion of this course, students should be able to:

a. construct P&ID for a given chemical process plant,
b. grasp the working principles of major process measurement devices,
c. select the right measurement devices for any given chemical processes,
d. design a control system for any given chemical processes,
e. and perform process controller tuning in time domain analysis.

4.0 METHODS OF INSTRUCTION

Lecture, Tutorial and Laboratory works as below:

Lecture :	3 hours /week
Tutorial :	1 hour / week
Laboratory:	3 hours/week

5.0 LESSON PLAN

WK	DURATION (hrs)	CHAPTER/CONTENT	ACTIVITIES
1	4	Introduction to process control & instrumentations. P&ID	Chp. 1 Appdx. A
2	4	Control strategies: Feedback, cascade, ratio & feedforward. Merits and demerits. Applications.	Chp. 1, Chp. 9, Chp. 11
3-4	6	Block diagrams and transfer functions. Block diagram in relation to P&ID.	Chp. 3
4-6	10	Instrumentations: Pressure, flow, level & temperature.	Appdx. C
7-8	8	Control valves: Principle, applications & characteristics.	Appdx. C & Chp. 5

9-10	6	Process characteristics: Self-regulating & non self regulating: Deadtime & time constant.	Chp. 3 (p.75-77) Chp. 7 (p.237) Chp. 4, p.97
10	2	Control signals	
11-12	8	Controller Tuning	Read Chapter 14 Conduct Test 2
14	4	Constraint & Selective controls	Chp. 10 (pp340-360)
15		REVISION WEEK	

6.0 ASSESSMENT

Laboratory work : 20%
Tests and Assignments : 20%
Final Examination : 60%

7.0 TEXTBOOK

Text book: Smith & Corripio (2006), *Principles and Practice of Automatic Process Control*, 3rd. Ed, Wiley Inc.

8.0 REFERENCES

Seborg, D.E., Edgar, T.F. & Mellichamp, D.A. (2004). *Process Dynamics and Control*, 2nd. Ed., John Wiley & Sons,.

Perry, R.H., Green, D.W. & Maloney, J.O. (1997). *Perry's Chemical Engineers Handbook*, 7th Edition, McGraw Hill.

9.0 ADDITIONAL INFORMATION

Attendance is compulsory. Students who fail to comply 80% of the attendance will be barred from taking the final exam. Absence from lecture, tutorial, test, presentation, etc must be supported by relevant document.

10.0 OTHER INFORMATION/DETAILS

PREPARED BY :	**APPROVED BY :**
SIGNATURE :	**SIGNATURE :**
NAME : Abdul Aziz Ishak **POSITION :** LECTURER **SIGNATURE :** **NAME :** Siti Rafidah Ab. Rashid **POSITION :** LECTURER **DATE :** 3 July 2008	**NAME :** **POSITION:** Chairperson of Chemical Engineering **DATE:** 3 July 2008

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Week	Discussed Topic	Course Outcome	Course Learning Outcomes The students should be to:	Methods of Instruction	Assessment
1					

COURSE OUTCOME: Statements describing what the student who completes the course is expected to acquire
LEARNING OUTCOME: Statements describing the student action that serves as evidence of knowledge, skills and attitude
PROGRAM OUTCOME: Statements describing the knowledge, skills and attitude acquired upon graduation

LIST OF PROGRAM OUTCOMES:

1. Ability to acquire and apply the knowledge of basic sciences, mathematics and engineering fundamentals to solve chemical engineering problems.
2. Ability to undertake problem identification, formulation and solution in engineering
3. Ability to design and conduct experiments, as well as to analyze and interpret data.
4. Ability to utilize modern engineering tools, components and systems.
5. Ability to utilize systems approach and evaluate operational performance to design related plants
6. Ability to acquire in-depth technical knowledge in chemical engineering principles
7. Ability to communicate effectively, not only with engineers but also with the community at large.
8. Understanding the importance of safety, health, and the environment including sustainable development
9. Ability to function effectively as an individual and in a group with the capacity to be a leader or manager as well as an effective team member
10. Nurture entrepreneurship in engineering related businesses.
11. Recognise the importance of the social, cultural and global contemporary issues and professional ethics in engineering practice.
12. Recognise the need to undertake lifelong learning and possess/acquire the capacity to do so.