

## Process Instrumentation I (PTAC 1332)



**Credit:** 3 semester credit hours (2 hours class lecture, 3 hours lab)

**Prerequisite/Co-requisite:** None

### Course Description

Study of the instruments and control systems used in the process industry including terminology, process variables, symbology, control loops, and basic troubleshooting.

### Required Textbook and Materials

1. CAPT; *Instrumentation*; Prentice Hall Publishing, 2009
  - a. ISBN number is 0-13-700413-3
2. *Simtronics Student Workbook* (Kampus Korner Bookstore only)

### Course Objectives

1. Explain the function of instruments used in the process industry.
2. Diagram the process control elements in a control loop.
3. Utilize terms and symbols in instrumentation.
4. Interpret process flow diagram and piping and instrumentation drawings.

### Course Outline

- A. Introduction
  1. Introduction of faculty and students
  2. Review Syllabus
  3. Review Class Policies
  4. Review Lab Assignment
- B. Learning Objectives
  1. Evolution of Process Instrumentation
  2. Process Variables
  3. Instrument Categories
- C. Pressure, Level, Flow, Analytical Instruments, Miscellaneous Devices
  1. Definitions
  2. Measurements
  3. Key Terms
- D. Control loops
  1. Simple Theory
  2. Primary Sensors, Transmitters  
Transmitters and Transducers
  3. Controllers and Final Control Element Overview
  4. Control Valves and regulators
- E. Symbology
  1. Process Diagrams
  2. Instrument Sketching
  3. Instrumentation Troubleshooting
  4. Emergency Shutdown

5. Instrumentation Malfunctions

**Grade Scale**

90 – 100	A
80 – 89	B
70 – 79	C
60 – 69	D
0 – 59	F

**Course Evaluation**

Final grades will be calculated according to the following criteria:

Final Exam	40%
Tests	40%
Homework	5%
Lab	15%

**Course Requirements**

1. Be able to answer questions on chapter assigned
2. Be able to identify equipment shown in lab associated with subject matter
3. Have a calculator and be able to use it.
4. Complete Simtronics Student Workbook.

**Attendance Policy**

1. Missing more than 20% of classes will result in an automatic “F” for the course.
2. Absences are counted for unexcused, excused and coming to class late.
3. Missing more than 20% of a class period will count as an absence.
4. Being tardy 2 times equals 1 absence.

**Course Policies**

1. No food, drinks, or use of tobacco products in class.
2. Beepers, telephones, headphones, and other electronic devices must be turned off while in class.
3. Do not bring children to class.
4. If a test is missed due to an emergency situation, the student will have one week to make it up; otherwise a grade of 0 will be assigned. Students are responsible for scheduling the make-up date.
5. No cheating of any kind will be tolerated. Students caught cheating or helping someone to cheat can and will be removed from the class for the semester. Cheating can result in expulsion from LIT.
6. A student who wishes to drop a course is responsible for initiating and completing the drop process. A student who stops coming to class, and fails to

drop the course, will earn an “F” in the course.

### **Disabilities Statement**

The Americans with Disabilities Act of 1992 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. Among other things, these statutes require that all students with documented disabilities be guaranteed a learning environment that provides for reasonable accommodations for their disabilities. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator at (409) 880-1737 or visit the online resource:

<http://www.lit.edu/depts/stuserv/special/defaults.aspx>

### **Student Code of Conduct Statement**

It is the responsibility of all registered Lamar Institute of Technology students to access, read, understand and abide by all published policies, regulations, and procedures listed in the *LIT Catalog and Student Handbook*. The *LIT Catalog and Student Handbook* may be accessed at [www.lit.edu](http://www.lit.edu) or obtained in print upon request at the Student Services Office.

### **Course Schedule**

<b>Week</b>	<b>Topic</b>	<b>Reference</b>
1	Course introduction and policies <ul style="list-style-type: none"><li>• Lecture/Lab</li><li>• Chapters 1 &amp; 2</li></ul>	Handouts
3	Chapter 2 <ul style="list-style-type: none"><li>• Lecture/ Lab</li></ul>	
4	Chapter 3 <ul style="list-style-type: none"><li>• Lecture/Lab</li><li>• Review</li><li>• Test</li></ul>	Chapters 1-3
5	Chapters 4 & 5 <ul style="list-style-type: none"><li>• Lecture/Lab</li><li>• Review</li></ul>	
6/7	Chapter 6 & 7 <ul style="list-style-type: none"><li>• Lecture/Lab</li><li>• Review</li></ul>	

PTAC 1332  
Course Syllabus

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8	Chapters 5 – 7 <ul style="list-style-type: none"><li>• Lecture/Lab</li><li>• Review</li><li>• Test2</li></ul>	
9	Chapter 8 <ul style="list-style-type: none"><li>• Lecture/Lab</li></ul>	
10/11	Chapter 9 & 10 <ul style="list-style-type: none"><li>• Lecture/Lab</li></ul>	
12	Chapter 11 <ul style="list-style-type: none"><li>• Lecture/Lab</li><li>• Review</li> <li>• Test 3</li></ul>	Chapters 8 - 11
13	Chapter 12 & 13 <ul style="list-style-type: none"><li>• Lecture/Lab</li><li>• Review</li></ul>	
14	Chapter 14 <ul style="list-style-type: none"><li>• Lecture/Lab</li><li>• Review</li></ul>	
15	Chapter 23 <ul style="list-style-type: none"><li>• Lecture/Lab</li><li>• Review</li></ul>	
16	Chapter 24 <ul style="list-style-type: none"><li>• Lecture/Lab</li><li>• Review</li></ul>	Chapters 23 & 24
17	Finals Week <ul style="list-style-type: none"><li>• Test 5</li></ul>	Chapters 1-14, 23 & 24

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