Course Information

Division: Industrial Technology Education
Course Number: ELT 162
Title: Process Measurement Instrumentation II
Credits: 3
Developed by: Charles A. Smith
Lecture/Lab Ratio: 1 Lecture/4 Lab
Transfer Status:

<table>
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<th>ASU</th>
<th>NAU</th>
<th>UA</th>
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<tr>
<td>MET Dept Elective</td>
<td>CTE Department</td>
<td>Not Transferable</td>
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Activity Course: No
CIP Code: 47.0105
Assessment Mode: Pre/Post Test (37 Questions/100 Points)
Semester Taught: Spring
GE Category: None
Separate Lab: No
Awareness Course: No
Intensive Writing Course: No

Prerequisites
ELT 161

Educational Value
A. To general education: Elective Credit.
B. To other courses or curricula: This course is a curriculum requirement for the Electrical and Instrumentation Technology Associate of Applied Science Degree.

Description
This course supplements concepts studied in ELT 161 and continues to analyze industrial process measurement and instrumentation. The course will allow the student to continue a study of the various industrial processes of pressure, temperature, level, flow, weight, force, position, and analytical measurement.

Supplies
Scientific Calculator recommended
Competencies and Performance Standards

1. Industrial Processes: Pressure, Level, Flow, Weight, Force, Temperature and Analytical

   Learning objectives
   What you will learn as you master the competency:
   a. Familiarization of various Pressure measuring instruments and methods
   b. Implementation of various Level measurement instruments and methods
   c. Examination of various weighing instruments and methods
   d. Analyze various Force measuring instrument and methods
   e. Utilization of Temperature measuring instruments and methods
   f. Comprehension of various Analytical measuring instruments and methods

   Performance Standards
   Competence will be demonstrated:
   o in written examinations
   o in class discussion
   o through group practice
   o by using model electrical circuits

   Criteria - Performance will be satisfactory when:
   o learner completes written test to 70%
   o learner manipulates model circuit to accomplish assigned task

2. Read Blueprints, Instrumentation Schematics and Symbols.

   Learning objectives
   What you will learn as you master the competency:
   a. Demonstrate understanding of basic Instrumentation Blueprints and Schematics
   b. Demonstrate knowledge of and indentify basic ISA symbols.

   Performance Standards
   Competence will be demonstrated:
   o in class discussion
   o through group practice
   o by using model electrical circuits
   o by satisfactory completion of written tests

   Criteria - Performance will be satisfactory when:
   o learner correctly identifies ISA symbols in a schematic drawing
   o learner correctly identifies different type of Instrumentation drawings

3. Calibrations and Analog Signals

   Learning objectives
   What you will learn as you master the competency:
   a. Comprehension of zero calibration.
   b. Comprehension of span calibration
   c. Analyzing use of analog signals of 4-20ma, 1-5v and 3-15psi
d. Familiarization in the use of an RTD calibrator, 4-20 ma calibrator, pneumatic calibrator

e. Practice in the use of a dead weight tester.

**Performance Standards**

*Competence will be demonstrated:*

- in class discussion
- through group practice
- by using model electrical circuits
- by written tests

*Criteria - Performance will be satisfactory when:*

- learner completes written test to 70%
- learner manipulates model circuit to accomplish assigned task

**Types of Instruction**

- Lecture/modeling
- Instrumentation Lab assignments
- Group practice
- Individual projects/presentations

**Grading Information**

**Grading Rationale**

<table>
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<tr>
<th>Component</th>
<th>Percentage</th>
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<tr>
<td>Post / Final Exam</td>
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<tr>
<td>Chapter Exams</td>
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<tr>
<td>Lab Assignments</td>
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<td>Attendance</td>
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**Grading Scale**

- **A** = 90% - 100%
- **B** = 80% - 89%
- **C** = 70% - 79%
- **D** = 60% - 69%
- **F** = Below 59%