Course Information

Division: Industrial Technology Education
Course Number: ELT 161
Title: Process Measurement Instrumentation I
Credits: 3
Developed by: Charles A. Smith
Lecture/Lab Ratio: 1 Lecture/4 Lab
Transfer Status: ASU | NAU | UA
| Elective Credit | CTE Department Elective | Not Transferable |
Activity Course: No
CIP Code: 47.0105
Assessment Mode: Pre/Post Test (31 Questions/100 Points)
Semester Taught: Spring
GE Category: None
Separate Lab: No
Awareness Course: No
Intensive Writing Course: No

Prerequisites
None

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

Description
This course is an introductory course in industrial process measurement and instrumentation. This course will introduce the student to the various industrial processes of pressure, temperature, level, flow, weight, force, position, and analytical measurement. The course also discusses the various instruments used in process measurements.

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:
   
   - In written examinations
   - In class discussion
   - Group practice
   - Using model electrical circuits
   
   Criteria - Performance will be satisfactory when:
   
   - Learner completes written test to 70%
   - 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:
   
   - In class discussion
   - Group practice
   - Using model electrical circuits
   - Written tests
   
   Criteria - Performance will be satisfactory when:
   
   - Learner correctly identifies ISA symbols in a schematic drawing
   - 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
- Group practice
- Using model electrical circuits
- 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>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Post / Final Exam</td>
<td>35%</td>
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<tr>
<td>Chapter Exams</td>
<td>35%</td>
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<tr>
<td>Lab Assignments</td>
<td>20%</td>
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<tr>
<td>Attendance</td>
<td>10%</td>
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**Grading Scale**

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