

**Common Course Outline**  
**IMTC 125**  
**INTRODUCTION TO INDUSTRIAL INSTRUMENTATION**  
**3 Semester Hours**

**The Community College of Baltimore County**

**Description**

Introduction to Industrial Instrumentation

Concentrates on the theories and concepts used in modern industry, and process controls to accurately measure and control the physical and chemical properties using those instrumentations.

Prerequisite: MATH 105, (RDNG 052 or LVR 2) or consent of program director.

**Overall Course Objectives.**

Upon completion of this course the student will be able to:

1. Have a Fundamental knowledge and understanding of:
  - A. Pressure Measurements
  - B. Temperature Measurements
  - C. Flow Measurements
  - D. Level Measurements
  - E. The basic Behavior of Materials.

**Major Topics**

1. Basic Behavior of Materials
  - A. Structure of the Atom
  - B. Linear Expansion
  - C. Volumetric Changes
2. Temperature Scales
  - A. Kelvin scale
  - B. Rankine scale
  - C. Absolute temperature
3. Pressure Measurement
  - A. absolute pressure
  - B. gage pressure
  - C. vacuum pressure
  - D. manometer theory
4. Gas Pressure Laws
  - A. Boyle's Law
  - B. Bernoulli's Theorem
  - C. Charles Law
5. Pneumatic Principles
  - A. Differential Pressure
  - B. Density
  - C. Volume Rate
6. Flow calculations
  - A. Acceleration due to gravity
  - B. Static Pressure

7. Transmission
  - A. Pneumatic Transmission
  - B. Electrical Transmission
8. Level
  - A. Direct Level Measurement
  - B. Indirect Level Measurement
9. Analysis
  - A. Density and specific gravity
  - B. Viscosity
  - C. Acidity and Alkalinity
  - D. Electric/thermal conductivity
  - E. Combustibility
10. Control
  - A. On/Off control
  - B. Proportional Control
  - C. Pneumatic Controllers
  - D. Electric Controllers
  - E. Control Valves
11. Application
  - A. Temperature control/pressure control
  - B. Level Control
  - C. Flow Control/cascade control
  - D. Analysis Control

## **Course Requirements**

Grading: Grading procedure will be determined by the individual faculty member but will include the following:

1. Attendance and participation
2. Two written exams: midterm and final
3. A minimum of 8 classroom/lab assignments

## **Other Course Information**