

Electrical Measurement Fundamentals

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The THORS *Electrical Measurement Fundamentals* course introduces learners to the various characteristics of electrical measurements, and classifications of electrical measuring instruments. This course also explains the working principles of electrical measuring instruments along with the different types of errors that affect electrical measurement operation.

Credit Hours **2**

Learning Objectives

- Identify the key characteristics of electrical measurements.
- Explain the different types of measurement errors and how they affect instrument readings.
- Describe the electrical measurement principles and their applications.
- Compare the types of electrical measuring instruments based on their functions and applications.
- Evaluate the role of supporting instruments in extending effective electrical measurement.

Table of Contents

I. Measurement Concepts

- **Measurement Characteristics**
 - Accuracy
 - Precision
 - Sensitivity
 - Resolution
- **Measurement Errors**
 - Gross Errors
 - Systematic Errors
 - Instrumental Errors
 - Environmental Errors
 - Observational Errors
 - Random Errors
- **Measurement Principles**
 - Electromagnetism
 - Moving Coil Mechanism
 - Moving Iron Mechanism
 - Electrostatics

I. Measurement Concepts (continued)

- Hall Effect
 - Resonance
- ### II. Measuring Instruments
- **Classifications**
 - Based on Output Signals
 - Analog Instruments
 - Digital instruments
 - Based on Methods of Measurement
 - Absolute Instruments
 - Secondary Instruments
 - **Supporting Instruments**
 - Instrument Transformers
 - Current Transformer (CT)
 - Potential Transformer (PT)
 - Transducers

