

# ENGINE TESTING METHODS AND SYSTEMS: INTERNAL COMBUSTION

*eLearning courses designed to increase productivity and profits*

## Learning made Simple, Visual, and Interactive



The Engine Testing Methods and Systems: Internal Combustion provides an overview of how engine tests are performed, the devices used in testing, and the basic concepts behind it. This course focuses on the different engine testing types that are commonly used, each type of mechanical device used to put the engine under test, and the common testing instrumentation associated with engine testing.

Credit Hours **2**

## Learning Objectives

- Understand the various types of testing applications.
- The different types of engine tests and engine testing methods.
- Determine which type of engine test that should be performed.
- Learn about the various mechanical devices associated with engine testing and how they function.
- Develop an understanding of the common instrumentation that is used in engine testing.
- Identify the different types of sensors and understand how they function.

## Table of Contents

### I. Basic Test Concepts

- Testing Applications
- Engine Testing Methods
  - Loaded Hot Testing
  - Unloaded Hot Testing
  - Non-Firing Testing
- Engine Test Types
- Data Acquisition
  - Sensors and Transducers
  - Signal Conditioning
  - Analog-to-Digital Converter
  - Computer

### II. Mechanical Devices

- Dynamometers
  - Eddy Current Dynamometer

- Water Brake Dynamometer
- Regenerative Electric Motor Dynamometer

### • Engine Test Stand

### III. Common Testing Instrumentation

#### • Common Sensor Operating Principles

- Strain Gauge
- Excitation
- Piezoelectricity

#### • Pressure Sensors

- Absolute Pressure Sensor
- Gauge Pressure Sensor
- Differential Pressure Sensor

#### • Air Flow Sensors

#### • Temperature Sensors

- RTD
- Thermocouple
- Thermistor

#### • Torque Sensors

- Load Cell, Slip Ring Sensor
- Transformer Coupled Sensor
- Radio Frequency Torque Sensor

#### • Vibration Sensors

- Accelerometers

#### • Exhaust Gas Analysis Sensors

