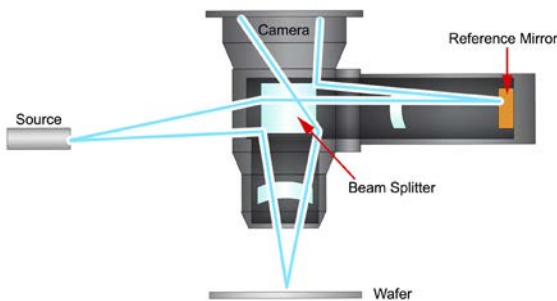


SEMICONDUCTOR METROLOGY INSTRUMENTS

eLearning courses designed to increase productivity and profits



Learning Made Simple, Visual, and Interactive

The THORS *Semiconductor Metrology Instruments* course introduces the learners to the various instruments used in semiconductor testing. This course focuses on wafer inspection systems, which are used for identifying defects, and process control metrology instruments, which are used for measuring various aspects of semiconductor manufacturing processes. Presented in THORS' highly visual and interactive learning format, this course will equip the learner with a foundational knowledge of semiconductor metrology.

Credit Hours **2**

Learning Objectives

- 💡 Identify the different wafer inspection systems and their optical and charged particle sources.
- 💡 Recognize some of the commonly used instruments in destructive techniques and their applications.
- 💡 Recognize some of the commonly used instruments in nondestructive techniques and their applications.
- 💡 Describe the instruments and techniques used in process control metrology for the different deposited films and intricate pattern designs.
- 💡 Explain the measurement techniques used for topography and physical dimension measurement.
- 💡 Distinguish between the various techniques for analyzing material composition.
- 💡 Understand the instruments used in material property measurements.

Table of Contents

I. Wafer Inspection System

- **Destructive Techniques**
 - ▣ Electron Beam
 - Electron Beam Inspection System
 - Scanning Electron Microscope (SEM)
 - ▣ Focused Ion Beam (FIB) Inspection System
- **Nondestructive Techniques**
 - ▣ Plasma Inspection System
 - ▣ Deep Ultraviolet (DUV) Inspection System
 - ▣ Laser Scanning Inspection System
 - ▣ X-Ray Inspection System
 - ▣ Automated Optical Inspection (AOI) System

II. Process Control Metrology

- **Topography and Physical Dimension**
 - ▣ Optical Profilometry
 - ▣ Interferometry
 - ▣ Ellipsometry
 - ▣ Spectroscopic Reflectometry
 - ▣ Scatterometry
 - ▣ Atomic Force Microscopy (AFM)
 - ▣ Optoacoustic Imaging
- **Material Composition**
 - ▣ X-Ray Photoelectron Spectroscopy (XPS)
 - ▣ X-Ray Diffraction (XRD)
 - ▣ Auger Electron Spectroscopy (AES)

II. Process Control Metrology (continued)

- ▣ Secondary Ion Mass Spectroscopy (SIMS)
- ▣ Rutherford Backscattering Spectroscopy (RBS)
- ▣ Fourier Transform Infrared (FTIR)
- **Material Property**
 - ▣ Four-Point Probe System
 - ▣ Resistivity Mapping System

