

# SEMICONDUCTOR BASICS

eLearning courses designed to increase productivity and profits

## Learning made Simple, Visual, and Interactive

The THORS *Semiconductor Basics* course offers a creative learning experience with visually appealing content and interactive quizzes. This electronics course covers basic semiconductor terminologies. Metal Oxide Semiconductor (MOS) technology covers the types of Metal Oxide Semiconductor Field Effect Transistors (MOSFETs) and the different segments of an Integrated Circuit (IC). Nodes are also presented to include the innovations in each IC segment and the characteristics of various devices that were possible due to the constant evolution of the semiconductor industry.

Credit Hours **2**

## Learning Objectives

- Define the major semiconductor terminologies.
- Identify the different types of Metal Oxide Semiconductors (MOSs).
- Distinguish the different segments of an Integrated Circuit (IC) and the major advancements in each segment.
- Recognize Moore's law and the evolution of technology nodes.
- Explain the common semiconductor devices, their working principles, and their applications.

## Table of Contents

### I. Semiconductor Terminology

- Charge Carrier
- Conductor
- Insulator
- Silicon Wafer
  - Types
  - Uses
- Transistor

### II. Metal Oxide Semiconductor (MOS) Technology

- Metal Oxide Semiconductor (MOS) Types
  - Positive-Channel Metal Oxide Semiconductor (PMOS)

### II. Metal Oxide Semiconductor (MOS) Technology (Continued)

- Negative-Channel Metal Oxide Semiconductor (NMOS)
- Complementary Metal Oxide Semiconductor (CMOS)
- Integrated Circuit (IC) Segments
  - Front End Of Line (FEOL)
  - Middle Of Line (MOL)
  - Back End Of Line (BEOL)
  - Packaging
  - Printed Circuit Board Assembly (PCBA)

### II. Metal Oxide Semiconductor (MOS) Technology (Continued)

- Nodes
  - FEOL Evolution
  - MOL Evolution
  - BEOL Evolution
- Common Semiconductor Devices
  - Microprocessor Chip
  - Memory Chip
  - Analog IC
  - Power Device
  - Thin Film Transistor (TFT)
  - CMOS Image Sensor
  - Micro-Electro-Mechanical System (MEMS)

