

SEMICONDUCTOR MANUFACTURING I

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Learning made Simple, Visual, and Interactive

Semiconductor manufacturing is a complex process involving many steps. This course covers two crucial steps in the manufacturing process: silicon wafer fabrication and semiconductor deposition. The silicon wafer fabrication step encompasses single crystal silicon growth, wafer grinding, wafer slicing, wafer edge grinding, wafer lapping, wafer etching, and wafer polishing. The semiconductor deposition step includes various important types of deposition processes in semiconductor manufacturing. To enhance the learning experience, the course contains interactive quizzes, allowing learners to test their knowledge and retention of visually engaging content.

Credit Hours **2**

Learning Objectives

- Describe the various steps involved in the fabrication of silicon wafers, including crystal growth, slicing, lapping, etching, and polishing.
- Recognize the types of epitaxy and the process involved in creating them.
- Identify the different types of deposition processes used to create thin films and patterns on silicon wafers, and the applications of each method.
- Explain the basic principles of the different types of deposition processes, such as CVD, PVD, ALD, ECD, and SOD.

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I. Silicon Wafer Fabrication Process

- Single Crystal Silicon Growth
- Wafer Grinding
- Wafer Slicing
- Wafer Edge Grinding
- Wafer Lapping
- Wafer Etching
- Wafer Polishing

II. Semiconductor Deposition

- Epitaxy
 - ▣ Types
 - ▣ Process
- Deposition
 - ▣ Chemical Vapor Deposition (CVD)
 - Thermal CVD
 - Plasma CVD
 - ▣ Atomic Layer Deposition (ALD)
 - Process
 - Types
 - Application

II. Semiconductor Deposition (continued)

- ▣ Physical Vapor Deposition (PVD)
 - Process
 - Other Sputter Depositions
 - Application
- ▣ Electrochemical Deposition (ECD)
 - Process
 - Application
- ▣ Spin-On Dielectric (SOD)

