



Indian Institute of Technology Delhi
(IIT Delhi)

Executive Programme in Semiconductor Manufacturing and Technology

Type

Executive Program

Mode

Online

Duration

6 Months

Total fees

₹ 125,000

Indian Institute of Technology Delhi (IIT Delhi)

Established in 1961 as an Institute of National Importance, the Indian Institute of Technology Delhi (IIT Delhi) is one of India's premier institutions for engineering, technology and research. Renowned for its academic excellence, innovation and global collaborations, the institute fosters interdisciplinary learning and industry-driven research. IIT Delhi is committed to developing future-ready professionals and leaders capable of driving technological advancement and societal impact.

Executive Programme in Semiconductor Manufacturing and Technology

Highlights

- ◆ Build foundational and advanced knowledge of semiconductor devices, materials and manufacturing technologies.
- ◆ Explore fabrication processes including lithography, doping, etching, oxidation, metallisation and thin-film deposition.
- ◆ Learn from faculty at IIT Delhi's Optics and Photonics Centre, supported by insights from industry experts.
- ◆ Understand semiconductor applications across electric vehicles, AI, data centres, space and high-performance computing.
- ◆ Participate in an optional two-day campus immersion and earn an e-Certificate from CEP, IIT Delhi upon successful completion.

Learning outcomes

- ◆ Explain semiconductor materials, device physics, energy bands, charge transport and junction behaviour.
- ◆ Evaluate key semiconductor fabrication processes and cleanroom practices used in integrated-circuit manufacturing.
- ◆ Assess device performance using concepts such as scaling, material selection, thermal management and power optimisation.
- ◆ Analyse semiconductor applications across AI, electric mobility, data centres, space and emerging technologies.
- ◆ Interpret global market trends, supply-chain challenges and commercial opportunities within the semiconductor industry.

Eligibility Criteria

B.Tech/M.Sc./10+2+3 diploma holders

Curriculum Overview

Module I: Fundamentals of Semiconductor Devices and Technology (5 subjects)

- ◆ Semiconductor Materials
- ◆ Energy Band Theory
- ◆ P-N Junctions
- ◆ Basic Semiconductor Devices
- ◆ Semiconductor Applications

Module II: Semiconductor Fabrication and Process Technologies (5 subjects)

- ◆ Introduction to Semiconductor Fabrication
- ◆ Lithography Techniques in Fabrication
- ◆ Doping and Material Modification
- ◆ Etching Processes in Semiconductor Manufacturing
- ◆ Cleanroom Practices and Environmental Control

Module III: Device Physics and Performance Optimization (5 subjects)

- ◆ Carrier Transport Mechanisms
- ◆ Junction Behavior
- ◆ Scaling and Miniaturization
- ◆ Material Selection
- ◆ Thermal and Power Management



Curriculum Overview (continued)

Module IV: Advanced Applications of Semiconductor Technology (5 subjects)

- ◆ Semiconductors in Electric Vehicles
 - ◆ Artificial Intelligence and Machine Learning
 - ◆ Data Centers and High-Performance Computing
 - ◆ Entertainment Technologies: Gaming and Beyond
 - ◆ Semiconductors in Space Applications
-

Module V: Semiconductor Market Dynamics and Commercial Opportunities (5 subjects)

- ◆ Global Semiconductor Market Overview
- ◆ Geopolitics and Semiconductor Trade Policies
- ◆ Supply Chain Dynamics and Challenges
- ◆ Investment and Innovation in Semiconductor Startups
- ◆ Emerging Technologies and Growth Opportunities

 Fee Structure

Fee heads	Year 1	Total
Program Fee	₹ 125,000	₹ 125,000
Total	₹ 125,000	₹ 125,000