



EOS/ESD Association, Inc. Online Academy Course Pathways

The main category organizes courses as shown on the top of each chart: Foundations/Fundamentals, Methods/Practices, Assessment, Explanatory, or Special Topics.

- Foundations/Fundamentals-essential courses for the development and implementation of ESD control or design
- Methods/Practices-courses that provide evaluation techniques and implementation criteria of ESD control or design
- Assessment-courses that provide verification techniques for process compliance and robustness
- Explanatory-courses that provide highlights, updates, and information
- Special Topic-courses that cover emerging or specific aspects of ESD control or design

Course levels organize courses underneath the categories: Basic, Intermediate, or Advanced.

- Basic-Foundation or Introductory courses
- Intermediate-Next level course
- Advanced- Highest Level of Technical content

Courses are organized on the left side of the charts by course area: Analysis, Design, ESD Control, or Testing.

- Analysis-
- Design-
- ESD Control-
- Testing-

The Online Academy course pathways companion document provides detailed information about each course. You can find the course numbers, title, certification program, abstracts, and learning outcomes in this document to learn more about each course. Additionally, this companion document provides the skill sets each course contains. Using this file, you can search and sort by Category, Level, Area, Skill, title, and course number.



EOS/ESD Association, Inc. Certification Programs

EOS/ESD Association, Inc. has several certification courses and programs.

Device

- Device Stress Testing
 - The ESD Device Stress Testing Certification is intended for individuals who are involved in ESD or Latch-Up stress testing ranging from qualification to TLP testing for ESD development. This certification ensures that a person has the latest information on the ESD standards used in industry along with an overview of the technical background to perform the tests or understand the testing results. In addition to learning the recommended test methodologies, a person will be exposed to common pitfalls in interpreting the standards and applying it to the testing procedures used in the lab.
- Professional Device Design
 - The Device Design Certification is a professional certification for ESD Certified Professional Design Engineers. This Program is intended for individuals who are involved in designing, characterizing, and implementing improved ESD protection designs. The requirement for certification is 10 courses and passing the Device Design Exam.
- ESD Design Engineer Certification (EDEC)
 - This certification provides courses that give the foundation for ESD Design Engineers. Courses cover integrated circuit ESD, protection designs, testing essentials, troubleshooting, failure analysis and TLP fundamental.
- ESD for Circuit Design Engineers Certification (ECEC 1)
 - The EOS/ESD Association's ESD for Circuit Design Engineers Certification provides the circuit design engineer with the knowledge and the skills to implement ESD protection circuits and latch-up mitigation on their integrated circuit (IC) designs using industry-proven best practices.



Manufacturing – Factory Control

- ESD Control Program Associate
 - This is comprised on three online classes and a knowledge assessment test. It provides the Basics of ESD, necessary fundamental information, the How To's of measurement and equipment, and a one day S20.20 class meant to provide an introduction to control program basics and auditing.
- Professional Program Manager
 - EOS/ESD Association, Inc. offers a professional certification for ESD control program managers. This program is intended for individuals who are involved in designing, implementing, managing, and auditing ESD control programs in their facilities.
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- ESD Control Program Auditor Certification
 - EOS/ESD Association's ESD Control Program Auditor certification provides an understanding of the ANSI/ESD S20.20-2021 standard and how its requirements provide a framework to control the risks of electrostatic discharge (ESD) within an organization. The certification teaches the knowledge and skills needed to successfully integrate ESD Control Program audits within an organization's quality management system internal audit program. Resources, such as; checklists, training slides, and guidance documents will be made available to attendees.

Facility

- ANSI/ESD S20.20 Facility Certification
 - To meet the global need in the electronics industry for technically sound ESD Control Programs, EOS/ESD Association, Inc. established an independent third-party facility certification program. The program is administered by EOS/ESD Association, Inc. through country accredited ISO9000 certified bodies that have met the requirements of this program. The Facility Certification Program evaluates a facility's ESD program based on the industry standards ANSI/ESD S20.20 or IEC 61340-5-1.

EOS/ESD Association's Manufacturing Certification Roadmap

	Foundation (Level 1)	Associate (Level 2)	Professional (Level 3)	Expert (Level 4)
ESD Control Program Management		<div style="border: 1px solid black; border-radius: 10px; background-color: #e0f2f1; padding: 5px; margin-bottom: 10px;">ESD Control Program Associate</div> <div style="text-align: center; margin-bottom: 5px;">↓</div> <div style="border: 1px solid black; border-radius: 10px; background-color: #fff9c4; padding: 5px;">ESD Control Program Coordinator</div>	<div style="border: 1px solid black; border-radius: 10px; background-color: #e0f2f1; padding: 5px; margin-left: 20px;">ESD Control Program Manager</div>	
ESD Control Program Auditing			<div style="border: 1px solid black; border-radius: 10px; background-color: #e0f2f1; padding: 5px;">ESD Control Program Auditor</div>	
ESD Control Program Measurements		<div style="border: 1px solid black; border-radius: 10px; background-color: #fff9c4; padding: 5px; margin-bottom: 10px;">Compliance Verification Technician</div> <div style="border: 1px solid black; border-radius: 10px; background-color: #ffe0b2; padding: 5px;">Product Qualification Technician</div>		<div style="border: 1px solid black; border-radius: 10px; background-color: #ffe0b2; padding: 5px;">ESD Process Assessment Engineer</div>

Legend:

Planned

In Development

Currently Available

EOS/ESD Association's Device Certification Roadmap

	Foundation (Level 1) Technician	Associate (Level 2) Emerging Engineer	Professional (Level 3)	Expert (Level 4)
Device Design		<div data-bbox="988 491 1447 719">EDEC 1</div> <div data-bbox="988 800 1447 1027">Device Design</div>	<div data-bbox="1523 491 1982 719">EDEC 2</div>	
Testing	<div data-bbox="453 1102 912 1330">Device Stress Testing</div>			
Circuit Design		<div data-bbox="988 1410 1447 1638">ECEC 1 ESD Circuit Design for Engineers</div>	<div data-bbox="1523 1410 1982 1638">ECEC 2 ESD Circuit Design for Engineers</div>	

Legend:

Planned

In Development

Currently Available

EOS/ESD Association's Facility Certification Roadmap

Certification

ESD Control
Program
Management

S20.20 Facility
Certification

Product Qualification
Facility Certification

Device Stress
Testing

Device Stress Testing
Facility Certification

Legend:

Planned

In Development

Currently Available

Foundations/Fundamentals			
Basic		Intermediate	Advanced
Analysis	DT142 Fundamentals of Failure Analysis	FC380 Electrostatic Calculations for the Program Manager and the ESD Engineer	
	DD213 ESD, EOS and Latch-up Failure Analysis for Designers		
Design	CD1-6 ESD/Latchup Product Testing Basics	DD100 ESD Circuits	DD200 Charged Device Model Phenomena, Design and Modeling
		DD103 An Overview of Integrated Circuit ESD: The ESD Threat, Testing, Design Concepts and Debugging	
		DD104 Electrostatic Discharge Effects in Integrated Circuit Technologies	DD300 Circuit-Level Modeling and Simulation of On-Chip Protection
	CD1-8 ESD Factory Control Basics	DD110 ESD From Basics to Advanced Protection Design	IF21-1 System Level ESD & EMC Design
		DD201 ESD Protection and I/O Design	
		DD214 Latchup Physics and Prevention	
		CD1-2 Basics of ESD and Latch-up device physics	IF21-5 Tech Needs for ESD Enablement: Impact of Technology Parameters, Technology Scaling vs. ESD Design
ESD Control	FC100 ESD Basics for the Program Manager	FC101 How To's of In-Plant ESD Auditing and Evaluation Measurements	FC340 ESD Program Development and Assessment (ANSI/ESD S2020 Seminar)
	DT140 ESD Fundamentals I for Stress Testing		
	DT141 ESD Fundamentals II for Stress Testing	FC164 Costly Controversial ESD Myths	
	DD/FC155 ESD Control Workstations: Set-up, Practical Considerations and Measurements		
	DD/FC161 Perfect ESD Storm		
	DD/FC165 ESD Control Concepts for Design, Validation, and Test Engineers	FC262 Electrical Fields and Particles - Practical Considerations for the Factory	
	FC166 ESD QMS Best Practices Strategy Including Class 0 And Costly Controversial ESD Myths	GP331 ESD Problem Solving	
	FC200 Packaging Principles for the Program Manager		
	FC231 Grounding in an Electrostatic Protected Area		
Testing	DT100 Human Body Model Testing Essentials	DD115 Latch-up Basics and Testing	
	DD/FC132 Susceptibility Testing of Devices and Systems		
	DT133 Fundamentals of ESD System Level Testing	DD231 ESD System Level: Physics, Testing, Debugging of Soft and Hard Failures	
	IF21-6 ESD Testing: Different TLP. Different IEC testing, Surge Test, etc.		

Methods/Practices			
	Basic	Intermediate	Advanced
Analysis	DD117 TCAD Fundamentals and First Applications to ESD	DD302 Troubleshooting On-Chip ESD Failures	
		CD1-7 ESD/Latchup failures troubleshooting techniques and case studies	
Design	DD134 Fundamentals of ESD System Level	DD381 Electronic Design Automation (EDA) Solutions for ESD	CD1-5 ESD compact models and simulation
		DD382 Electronic Design Automation (EDA) Solutions for Latch-up	
		CD1-3 ESD Circuit/Chip Design Implementation (with Layout principles): Mixed-Signal/High-Voltage	CD1-10 ESD circuit/chip design implementation (with Layout principles): CMOS
		CD1-4 ESD EDA Verification Tools	
		CD1-9 ESD System Level Basics	
		FC21-2 Design Constraints of ESD Circuits for High Speed Applications	IF21-3 SoC ESD Design and Verification
		FC21-4 Circuit Design - Pcell, Clamps Design, Different ESD Protection Concept	
ESD Control	FC110 Cleanroom Considerations for the Program Manager	FC365 Practical Applications of Ionization	
	FC120 Ionization Issues and Answers for the Program Manager		
	FC121 Grounding - Variations, Concepts, Nuisances, Equipment & Troubleshooting		
	DT143 Essentials for controlling the ESD Work Area		
	FC181 Highlights and Key Concepts Footwear Flooring		
	FC181 Highlights and Key Concepts Footwear Flooring [Korean]		
	FC181 Highlights and Key Concepts Footwear Flooring [Thai]		
	FC210 ESD Standards Overview for the Program Manager		
FC211 Compliance Verification: Pitfalls of Auditing			
Testing	DT131 HMM – System Level Testing of Components (ELECTIVE)	DT200 CDM Testing Essentials	
		DT201 Latchup Testing and Troubleshooting (ELECTIVE)	
		DT210 TLP Fundamentals – Understanding the Equipment Options and IV Data (ELECTIVE)	
	FC150 Hands-on ESD Measurements & Instruments-Uses and Pitfalls	DT212 VF-TLP, An Introduction to Capabilities and Applications (ELECTIVE)	
		DD220 Transmission Line Pulse (TLP) Basics and Applications	
	CD1-1 Background of ESD basics and models	DT230 Device Testing Correlation to Root Cause Failure Analysis	
		DD240 ESD Device Qualification Testing	

Assessment

Intermediate

FC170 ANSI/ESD S20.20 – ESD Program
Assessment for Internal Auditors and Supplier
Quality Engineers

FC390 Basics of ESD Process Assessment with
Hands-On

FC391 Basics of ESD Process Assessment

ESD Control

		Explanatory	
		Intermediate	Advanced
Design			DD208 ESD Parameters for the Foundry, IC Designer and IP/EDA Vendor
	DT202 Device Stress Testing Standard Updates (RENEWAL)		
Testing	DT220 ESD Test Simplification with Approved Sampling Methods in HBM (DST Statistical Sampling) (ELECTIVE)		

Explanatory

Intermediate

Advanced

Design

DD208 ESD Parameters for the Foundry, IC Designer and IP/EDA Vendor

Testing

DT202 Device Stress Testing Standard Updates (RENEWAL)

DT220 ESD Test Simplification with Approved Sampling Methods in HBM (DST Statistical Sampling) (ELECTIVE)

Special Topic			
Basic		Intermediate	Advanced
Analysis		FC220 Device Technology and Failure Analysis for the PrM	
		GP230 Charged Board Event: A Growing Industry Concern	
		GP250 EOS- A Big Challenge in Todays Handling of Customer Rejects (IEW)	
		DD/FC250 What information needs to be exchanged for potential EOS problem	
Design	DD318 FinFET and Advanced CMOS Technology ESD TCAD Simulations	DD150 Introduction to RF ESD Design	DD205 TCAD Methodologies for Industrial ESD Design (IEW)
		DD203 Designing ESD protection for RF and mmWave	
		DD204 ESD Design in HV Technologies	DD317 ESD Challenges in Advanced FinFET and GAA NW CMOS Technologies
		DD222 Practical Aspects of Latch-Up for Low Voltage CMOS: Design Rules, Layout Floor Planning, and Test	
		DD260 Design for EOS Reliability	
		DD311 Impact of Technology Scaling on Components High Current Phenomena and Implications for Robust ESD Design	
		GP330 Overview of Efficient Reliable System-Level ESD (IEW)	DD340 Integrated ESD Device and Board Level Design
ESD Control	FC165 Novel Methods for Fixing ESD Issues in the factory for both electronics & explosive products	FC115 Contamination & ESD Issues in Flat Panel Display Manufacturing Process	FC370 Basics of EMI and EOS in Manufacturing Environment and Their Mitigation
		FC180 Controlling ESD in Automated Equipment by Proper Grounding	
		DD/FC240 System Level ESD/EMI (Principles, Design Troubleshooting, & Demonstrations)	
	FC201 ESD - A Surprisingly Frequent Root Cause of Device Failure	GP241 Ultra-Sensitivity Trends and CDM	
		DD/FC330 Control of Charged Board Event (CBE)	
		FC360 Electrical Overstress in Manufacturing and Test	
		FC361 Ultra-sensitive (Class 0) Devices: ESD Controls and Auditing Measurements	
Testing		DD/FC122 Use of the Digital Sampling Oscilloscope for ESD Measurements	DT300 Advanced HBM – Dealing with Tester Parasitics, High Pin Count Devices and Two Pin Testing
		DD/FC130 System Level ESD/EMI: Testing to IEC and Other Standards	
		FC140 System Level for the PrM	
		DT211 High Speed Digital Oscilloscope Fundamentals	