

## 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.

**F<u>oundations/Fundamentals</u>** - essential courses for the development and implementation of ESD control or design

<u>Methods/Practices</u> - 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

**<u>Special Topic</u>** - 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 1 (EDEC1)
  - 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)

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- 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.
- ESD Design Engineer Certification 2 (EDEC2)
  - This certification provides courses that build upon the foundation for ESD Design Engineers to help engineers advance their skill/knowledge levels in the area of ESD device design.





#### 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.
- 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

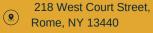
- ANSI/ESD S20.20 Facility Certification
  - To meet the global need in the electronics industry for technically sound ESD Control Programs, EOS/ESD Association, Inc. established an independent third-party facility certification program. The program is administered by EOS/ESD Association, Inc. through 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.
- Product Qualification Laboratory Certification
  - Companies that earn the Product Qualification Laboratory Certification meet the requirements for establishing, implementing, and maintaining an electrostatic discharge (ESD) product qualification laboratory that conduct ESD product qualification measurements on materials and control items generally used within an ESD control program, according to ANSI/ESD S20.20 standards. Product Qualification Laboratory Certification allows your organization to choose various standards for endorsement, solidifying your expertise in specific areas of ESD control. Showcase your specialized proficiency in various EOS/ESD Association Standards.

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#### Personal Certification

- ESDA Certified Professional Instructor Certification
  - EOS/ESD Association's Certified Professional Instructor Class provides best-practices for course instruction. This class teaches the knowledge and skills needed to develop and deliver an effective and rewarding presentation. It presents an overview of instructor competencies to plan, create and furnish a presentation with outstanding instructional techniques and approaches.





### EOS/ESD ASSOCIATION, INC.'S MANUFACTURING CERTIFICATION ROADMAP

	Foundation (Level 1)	Associate (Level 2)	Professional (Level 3)	Expert (Level 4)
ESD Control Program Management	ESDA Certified Professional Instructor	ESD Control Program Associate ESD Control Program Coordinator	ESD Control Program Manager	
ESD Control Program Auditing			ESD Control Program Auditor	
ESD Control Program Measurements		Compliance Verification Technician Product Qualification Technician	ESD Process Assessment Engineer	

### EOS/ESD ASSOCIATION, INC.'S DEVICE CERTIFICATION ROADMAP

	Foundation (Level 1)	Associate (Level 2)	Professional (Level 3)	Expert (Level 4)
Device Design		EDEC 1	EDEC 2	
Testing	Device Stress Testing			
Circuit Design		ECEC 1 ESD Circuit Design for Engineers	ECEC 2 ESD Circuit Design for Engineers	

 Legend:
 Planned
 In Development
 Currently Available

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# EOS/ESD ASSOCIATION, INC.'S FACILITY CERTIFICATION ROADMAP

	Certification	
ESD Control Program Management	S20.20 Facility   Certification   Product Qualification Laboratory Certification	
Device Stress Testing	Device Stress Testing Facility Certification	



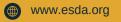


	Foundations/Fundamentals		
	Basic	Intermediate	Advanced
	DT142 Fundamentals of Failure Analysis		
Analysis	DD213 ESD, EOS and Latch-up Failure Analysis for Designers	FC380 Electrostatic Calculations for the Program Manager and the ESD Engineer	

	CD1-6 ESD/Latchup Product Testing Basics	DD100 ESD Circuits	DD200 Charged Davies Medel	
		DD103 An Overview of Integrated Circuit ESD: The ESD Threat, Testing, Design Concepts and Debugging	DD200 Charged Device Model Phenomena, Design and Modeling	
D	Dusito	DD104 Electrostatic Discharge Effects in Integrated Circuit Technologies	DD300 Circuit-Level	
D e s i g n	CD1-8 ESD Factory Control Basics	DD110 ESD From Basics to Advanced Protection Design	Modeling and Simulation of On-Chip Protection	
		DD201 ESD Protection and I/O Design	IF21-1 System Level ESD & EMC Design	
		DD214 Latchup Physics and Prevention	IF21-5 Tech Needs for ESD	
		CD1-2 Basics of ESD and Latch-up device physics	Enablement: Impact of Technology Parameters, Technology Scaling vs. ESD Design	

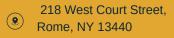


	Foundations/Fundam	ientals	
	Basic	Intermediate	Advanced
	FC100 ESD Basics for the Program Manager	FC101 How To?s of In-Plant ESD Auditing and Evaluation	
	FC105 Safe Equipment Handling in Your EPA Explained	Measurements	
	DT140 ESD Fundamentals I for Stress Testing	FC164 Costly Controversial	
	DT141 ESD Fundamentals II for Stress Testing	ESD Myths	
E S	DD/FC155 ESD Control Workstations: Set-up, Practical Considerations		FC340 ESD Program Development and Assessment (ANSI/ESD S2020 Seminar)
D C n	DD/FC161 Perfect ESD Storm	FC262 Electrical Fields and Particles - Practical	
t r O I	DD/FC165 ESD Control Concepts for Design, Validation, and Test Engineers	Considerations for the Factory	
	FC166 ESD QMS Best Practices Strategy Including Class 0		
	FC200 Packaging Principles for the Program Manager		
	FC231 Grounding in an Electrostatic	GP331 ESD Problem Solving	
	PRMAFC340 ESD Control Program Development to ANSI ESD S20.20		





	Foundations/Fundamentals		
	Basic	Intermediate	Advanced
т	DT100 Human Body Model Testing Essentials	IF21-6 ESD Testing: Diffferent TLP. Different	
e s t	DD/FC132 Susceptibility Testing of Devices and Systems	IEC testing, Surge Test, etc.	
n g	DT133 Fundamentals of ESD System Level Testing	DD231 ESD System Level: Physics, Testing,	
	IF21-6 ESD Testing: Diffferent TLP. Different IEC testing, Surge Test, etc.	Debugging of Soft and Hard Failures	





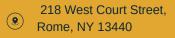
		Methods/Practices		
	Basic	Intermediate	Advanced	
A n		DD302 Troubleshooting On-Chip ESD Failures		
a I y s i s	DD117 TCAD Fundamentals and First Applications to ESD	CDI-7 ESD/Latchup failures troubleshooting techniques and case studies		
	DD134 Fundamentals of ESD System Level	CDI-3 ESD Circuit/Chip Design Implementation (with Layout principles): Mixed-Signal/High-Voltage	CDI-5 ESD compact models and simulation	
D		CDI-4 ESD EDA Verification Tools		
e s i		CDI-9 ESD System Level Basics	CDI-10 ESD circuit/chip	
g n		FC21-2 Design Constraints of ESD Circuits for High Speed Applications	design implementation (with Layout principles): CMOS	
		FC21-4 Circuit Design - Pcell, Clamps Design, Different ESD Protection Concept	IF21-3 Soc ESD Design and Verification	





	Methods/Practices		
	Basic	Intermediate	Advanced
	FCII0 Cleanroom Considerations for the Program Manager		
	FC120 Ionization Issues and Answers for the Program Manager		
E S D	FC121 Grounding - Variations, Concepts, Nuisances, Equipment & Troubleshooting		
с	DT143 Essentials for controlling the ESD Work Area		
o n t	FC181 Highlights and Key Concepts Footwear Flooring		
r O	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		

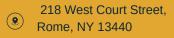






	Methods/Practices		
	Basic	Intermediate	Advanced
	DT131 HMM - System Level Testing of Components	DT200 CDM Testing Essentials	
	(ELECTIVE)	DT201 Latchup Testing and Troubleshooting (ELECTIVE)	
	FC150 Hands-on ESD Measurements & Instruments-	DT210 TLP Fundamentals - Understanding the Equipment Options and IV Data (ELECTIVE)	
e s t i n	Uses and Pitfalls	DT212 VF-TLP, An Introduction to Capabilities and Applications (ELECTIVE)	
g	CDI-1 Background of ESD basics and models	DD220 Transmission Line Pulse (TLP) Basics and Applications	
		DT230 Device Testing Correlation to Root Cause Failure Analysis	
		D0240 ESD Device Qualification Testing	







	Assessment	
	Intermediate	
E S D	FC170 ANSI/ESD S20.20 - ESD Program Assessment for Internal Auditors and Supplier Quality Engineers	
C o n	FC390 Basics of ESD Process Assessment with Hands-On	
t r o l	FC391 Basics of ESD Process Assessment	

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





	ASSOCIATION ® Special Topic			
	Basic	Intermediate	Advanced	
A n a I y s i s		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		
De	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		
s i g		DD260 Design for EOS Reliability	DD319 Physical Process,	
9 n		DD311 Impact of Technology Scaling on Components High Current Phenomena and Implications for Robust ESD Design	Device and Circuit Simulation (TCAD) Methodologies in Application to Industrial ESD Research and Design	
		GP330 Overview of Efficent Relaible System-Level ESD (IEW)	DD340 Integrated ESD Device and Board Level Design	

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	Special Topic			
	Basic	Intermediate	Advanced	
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)		
		GP241 Ultra-Sensitivity Trends and CDM		
	FC201 ESD - A Surprisingly Frequent Root Cause of Device Failure	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		
T e s t i		DD/FC122 Use of the Digital Sampling Oscilloscope for ESD Measurements	DT300 Advanced HBM ?	
		DD/FC130 System Level ESD/EMI: Testing to IEC and Other Standards	Dealing with Tester Parasitics, High Pin Count Devices and Two Pin	
n g		FC140 System Level for the PrM	Testing	
		DT211 High Speed Digital Oscilloscope Fundamentals		

