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 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)
  - 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.

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.

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 Device Design →	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		

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	
		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 Enablement: Impact of Technology Parameters, Technology Scaling vs. ESD Design
		CD1-2 Basics of ESD and Latch-up device physics	

	Foundations/Fundamentals		
	Basic	Intermediate	**Advanced**
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)
	FC105 Safe Equipment Handling in Your EPA Explained		
	DT140 ESD Fundamentals I for Stress Testing	FC164 Costly Controversial ESD Myths	
	DT141 ESD Fundamentals II for Stress Testing		
	DD/FC155 ESD Control Workstations: Set-up, Practical Considerations	FC262 Electrical Fields and Particles - Practical Considerations for the Factory	
	DD/FC161 Perfect ESD Storm		
	DD/FC165 ESD Control Concepts for Design, Validation, and Test Engineers		
	FC166 ESD QMS Best Practices Strategy Including Class 0		
	FC200 Packaging Principles for the Program Manager	GP331 ESD Problem Solving	
	FC231 Grounding in an Electrostatic		
	PRMAFC340 ESD Control Program Development to ANSI ESD S20.20		

	Foundations/Fundamentals		
	Basic	Intermediate	**Advanced**
Testing	DT100 Human Body Model Testing Essentials	IF21-6 ESD Testing: Diffferent TLP. Different IEC testing, Surge Test, etc.	
	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: Diffferent 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	
		CDI-7 ESD/Latchup failures troubleshooting techniques and case studies	
Design	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
		CDI-4 ESD EDA Verification Tools	
		CDI-9 ESD System Level Basics	CDI-10 ESD circuit/chip design implementation (with Layout principles): CMOS
		FC21-2 Design Constraints of ESD Circuits for High Speed Applications	
		FC21-4 Circuit Design - Pcell, Clamps Design, Different ESD Protection Concept	IF21-3 Soc ESD Design and Verification

	Methods/Practices		
	Basic	Intermediate	**Advanced**
ESD Control	FCll0 Cleanroom Considerations for the Program Manager		
	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		

	Methods/Practices		
	Basic	Intermediate	**Advanced**
Testing	DT131 HMM - System Level Testing of Components (ELECTIVE)	DT200 CDM Testing Essentials	
		DT201 Latchup Testing and Troubleshooting (ELECTIVE)	
	FC150 Hands-on ESD Measurements & Instruments-Uses and Pitfalls	DT210 TLP Fundamentals - Understanding the Equipment Options and IV Data (ELECTIVE)	
		DT212 VF-TLP, An Introduction to Capabilities and Applications (ELECTIVE)	
	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
ESD Control	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

	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	DD319 Physical Process, Device and Circuit Simulation (TCAD) Methodologies in Application to Industrial ESD Research and Design
		DD311 Impact of Technology Scaling on Components High Current Phenomena and Implications for Robust ESD Design	
		GP330 Overview of Efficent Relaible System-Level ESD (IEW)	DD340 Integrated ESD Device and Board Level Design

	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	
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	