



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.'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 | 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



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

| | Certification | | | |
|--------------------------------|---------------|--|--|--|
| ESD Control Program Management | | <div>S20.20 Facility Certification</div> <div>Product Qualification Laboratory Certification</div> | | |
| Device Stress Testing | | <div>Device Stress Testing Facility Certification</div> | | |

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 | | |

| Basic | | Intermediate | Advanced |
|--------|--|---|--|
| 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 |
| | | 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 |
| E S D C o n t r o l | 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 S20.20 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 Protected Area | | |
| | PRMAFC340 ESD Control Program Development to ANSI ESD S20.20 | | |
| | CD1-8 ESD Factory Control Basics | | |

**Foundations/Fundamentals****Basic****Intermediate****Advanced**T
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DT100 Human Body Model Testing Essentials

DD/FC132 Susceptibility Testing of Devices and Systems

DT133 Fundamentals of ESD System Level Testing

IF21-6 ESD Testing: Different TLP. Different IEC testing, Surge Test, etc.

IF21-6 ESD Testing:
Different TLP. Different
IEC testing, Surge Test,
etc.DD231 ESD System
Level: Physics, Testing,
Debugging of Soft and
Hard Failures



| | Methods/Practices | | |
|--------------------------------------|---|--|--|
| | Basic | Intermediate | Advanced |
| A n a l y s i s | DD117 TCAD Fundamentals and First Applications to ESD | DD302 Troubleshooting On-Chip ESD Failures | |
| | | CDI-7 ESD/Latchup failures troubleshooting techniques and case studies | |
| D e s i g n | 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 |
| E S D C o n t r o l | FCII0 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 |
| T e s t i n g | 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 |
| E S D C o n t r o l | 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 |
| D e s i g n | | DD208 ESD Parameters for the Foundry, IC Designer and IP/EDA Vendor |
| T e s t i n g | 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 |
| A n a l 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 | |
| D e s i g n | 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 Efficient Reliable System-Level ESD (IEW) | DD340 Integrated ESD Device and Board Level Design |



| | Special Topic | | |
|--|--|--|---|
| | Basic | Intermediate | Advanced |
| E S D C o n t r o l | 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 n g | | 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 | |