

uCertify

Course Outline

Practical ESD Protection Design



26 Apr 2025

1. Pre-Assessment
 2. Exercises, Quizzes, Flashcards & Glossary
Number of Questions
 3. Expert Instructor-Led Training
 4. ADA Compliant & JAWS Compatible Platform
 5. State of the Art Educator Tools
 6. Award Winning Learning Platform (LMS)
 7. Chapter & Lessons
Syllabus
Chapter 1: Preface
Chapter 2: Why ESD?
Chapter 3: ESD Failure Analysis
Chapter 4: ESD Test Models and Standards
Chapter 5: ESD Protection Devices
Chapter 6: ESD Protection Circuits
Chapter 7: Full-Chip ESD Protection
Chapter 8: Mixed-Signal and HV ESD Protection
Chapter 9: TCAD-Based Mixed-Mode ESD Protection Designs
Chapter 10: RF ESD Protection
Chapter 11: ESD-RFIC Co-Design
Chapter 12: ESD Layout Designs
Chapter 13: ESD versus IC Technologies
Chapter 14: ESD Circuit Simulation by SPICE
Chapter 15: Emerging ESD Protection
Chapter 16: ESD CAD for Full-Chip Design Verification
Chapter 17: New CDM ESD Protection
Chapter 18: Future ESD Protection Outlook
- Videos and How To

8. Practice Test

Here's what you get

Features

9. Post-Assessment

1. Pre-Assessment

Pre-Assessment lets you identify the areas for improvement before you start your prep. It determines what students know about a topic before it is taught and identifies areas for improvement with question assessment before beginning the course.

2. Exercises

There is no limit to the number of times learners can attempt these. Exercises come with detailed remediation, which ensures that learners are confident on the topic before proceeding.

100
EXERCISES

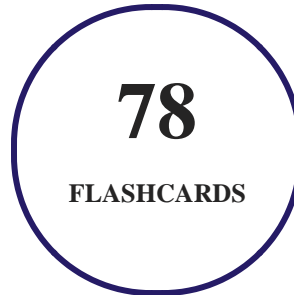
3. Quiz

Quizzes test your knowledge on the topics of the exam when you go through the course material. There is no limit to the number of times you can attempt it.

153
QUIZ

4. flashcards

Flashcards are effective memory-aiding tools that help you learn complex topics easily. The flashcard will help you in memorizing definitions, terminologies, key concepts, and more. There is no limit to the number of times learners can attempt these. Flashcards help master the key concepts.



5. Glossary of terms

uCertify provides detailed explanations of concepts relevant to the course through Glossary. It contains a list of frequently used terminologies along with its detailed explanation. Glossary defines the key terms.



6. Expert Instructor-Led Training

uCertify uses the content from the finest publishers and only the IT industry's finest instructors. They have a minimum of 15 years real-world experience and are subject matter experts in their fields. Unlike a live class, you can study at your own pace. This creates a personal learning experience and gives you all the benefit of hands-on training with the flexibility of doing it around your schedule 24/7.

7. ADA Compliant & JAWS Compatible Platform

uCertify course and labs are ADA (Americans with Disability Act) compliant. It is now more accessible to students with features such as:

- Change the font, size, and color of the content of the course
- Text-to-speech, reads the text into spoken words
- Interactive videos, how-tos videos come with transcripts and voice-over
- Interactive transcripts, each word is clickable. Students can clip a specific part of the video by clicking on a word or a portion of the text.

JAWS (Job Access with Speech) is a computer screen reader program for Microsoft Windows that reads the screen either with a text-to-speech output or by a Refreshable Braille display. Student can easily navigate uCertify course using JAWS shortcut keys.

8. State of the Art Educator Tools

uCertify knows the importance of instructors and provide tools to help them do their job effectively. Instructors are able to clone and customize course. Do ability grouping. Create sections. Design grade scale and grade formula. Create and schedule assessments. Educators can also move a student from self-paced to mentor-guided to instructor-led mode in three clicks.

9. Award Winning Learning Platform (LMS)

uCertify has developed an award winning, highly interactive yet simple to use platform. The SIIA CODiE Awards is the only peer-reviewed program to showcase business and education technology's finest products and services. Since 1986, thousands of products, services and solutions have been recognized for achieving excellence. uCertify has won CODiE awards consecutively for last 7 years:

- **2014**
 1. Best Postsecondary Learning Solution

- **2015**

1. Best Education Solution
2. Best Virtual Learning Solution
3. Best Student Assessment Solution
4. Best Postsecondary Learning Solution
5. Best Career and Workforce Readiness Solution
6. Best Instructional Solution in Other Curriculum Areas
7. Best Corporate Learning/Workforce Development Solution

- **2016**

1. Best Virtual Learning Solution
2. Best Education Cloud-based Solution
3. Best College and Career Readiness Solution
4. Best Corporate / Workforce Learning Solution
5. Best Postsecondary Learning Content Solution
6. Best Postsecondary LMS or Learning Platform
7. Best Learning Relationship Management Solution

- **2017**

1. Best Overall Education Solution
2. Best Student Assessment Solution
3. Best Corporate/Workforce Learning Solution
4. Best Higher Education LMS or Learning Platform

- **2018**

1. Best Higher Education LMS or Learning Platform
2. Best Instructional Solution in Other Curriculum Areas
3. Best Learning Relationship Management Solution

- **2019**

1. Best Virtual Learning Solution
2. Best Content Authoring Development or Curation Solution
3. Best Higher Education Learning Management Solution (LMS)

- 2020
 1. Best College and Career Readiness Solution
 2. Best Cross-Curricular Solution
 3. Best Virtual Learning Solution

10. Chapter & Lessons

uCertify brings these textbooks to life. It is full of interactive activities that keeps the learner engaged. uCertify brings all available learning resources for a topic in one place so that the learner can efficiently learn without going to multiple places. Challenge questions are also embedded in the chapters so learners can attempt those while they are learning about that particular topic. This helps them grasp the concepts better because they can go over it again right away which improves learning.

Learners can do Flashcards, Exercises, Quizzes and Labs related to each chapter. At the end of every lesson, uCertify courses guide the learners on the path they should follow.

Syllabus

Chapter 1: Preface

Chapter 2: Why ESD?

- A Historical Perspective
- ESD and the Dangers
- ESD Protection: The Principles
- ESD Protection: More or Less?
- ESD Protection: Evolution to Revolution

Chapter 3: ESD Failure Analysis

- ESD Failure Analysis
- ESD FA Techniques
- ESD Failure Signatures
- ESD Soft Failures
- ESD Failure Correlation
- ESD Failure Models

Chapter 4: ESD Test Models and Standards

- ESD Origins
- HBM Model
- MM Model
- CDM Model
- IEC Model
- TLP Model
- Summary

Chapter 5: ESD Protection Devices

- On-Chip ESD Protection Mechanisms
- Diode for ESD Protection
- BJT for ESD Protection
- MOSFET for ESD Protection
- SCR for ESD Protection
- Summary

Chapter 6: ESD Protection Circuits

- I/O ESD Protection
- ESD Self-Protection
- Low-Triggering ESD Protection Circuits
- ESD Power Clamps
- Summary

Chapter 7: Full-Chip ESD Protection

- Full-Chip ESD Protection Principles
- ESD Protection Design Window
- Advanced ESD Protection: More at Less
- Full-Chip ESD Protection Schemes

- No Universal ESD Protection Solution

Chapter 8: Mixed-Signal and HV ESD Protection

- ESD Protection for Mixed-Signal ICs
- ESD Protection for Multiple-Voltages ICs
- ESD Protection for High-Voltage ICs
- Summary

Chapter 9: TCAD-Based Mixed-Mode ESD Protection Designs

- ESD Design Optimization and Prediction
- TCAD-Based Mixed-Mode ESD Simulation-Design Methodology
- Mixed-Mode ESD Simulation-Design Examples
- Summary

Chapter 10: RF ESD Protection

- What Is Special for RF ESD Protection?
- RF ESD Protection Characterization
- Low-Parasitic ESD Protection Solutions
- RF ESD Protection Design Example

- Summary

Chapter 11: ESD-RFIC Co-Design

- ESD-IC Interactions
- ESD-RFIC Co-Design
- Summary

Chapter 12: ESD Layout Designs

- Layout is Critical to ESD Protection
- Basic ESD Protection Layout
- Advanced ESD Protection Layout
- 3D TCAD for ESD Layout Designs
- Summary

Chapter 13: ESD versus IC Technologies

- IC Technologies and ESD Protection
- Technology Affects ESD Design Window
- Lowering ESD Protection for Advanced ICs?
- Summary

Chapter 14: ESD Circuit Simulation by SPICE

- ESD Device Behavior Modeling
- Full-Chip ESD Circuit Simulation by SPICE
- Summary

Chapter 15: Emerging ESD Protection

- Emerging ESD Protection Challenges
- Dispensable ESD Protection
- Field-Programmable ESD Protection
- Interposer/TSV-Based ESD Protection
- Summary

Chapter 16: ESD CAD for Full-Chip Design Verification

- Full-Chip ESD Design Verification
- CAD Algorithms for ESD Design Verification
- Full-Chip ESD Design Verification Examples
- Summary

Chapter 17: New CDM ESD Protection

- Misconception in CDM ESD Protection
- Analyzing Pad-Based CDM ESD Protection
- Internally Distributed CDM ESD Protection
- Summary

Chapter 18: Future ESD Protection Outlook

- The Fundamental ESD Protection Problem
- Above-IC Nano-Crossbar Array ESD Switch
- Graphene ESD Protection Switch
- Graphene ESD Protection Interconnects
- Future ESD Protection Outlook
- Summary

11. Practice Test

Here's what you get

17

POST-ASSESSMENTS
QUESTIONS

Features

Each question comes with detailed remediation explaining not only why an answer option is correct but also why it is incorrect.

Unlimited Practice

Each test can be taken unlimited number of times until the learner feels they are prepared. Learner can review the test and read detailed remediation. Detailed test history is also available.

Each test set comes with learn, test and review modes. In learn mode, learners will attempt a question and will get immediate feedback and complete remediation as they move on to the next question. In test mode, learners can take a timed test simulating the actual exam conditions. In review mode, learners can read through one item at a time without attempting it.

12. Post-Assessment

After completion of the uCertify course Post-Assessments are given to students and often used in conjunction with a Pre-Assessment to measure their achievement and the effectiveness of the exam.

You can't stay away! Get