

# uCertify

## Course Outline

### Internet of Things (IoT)



24 Apr 2025

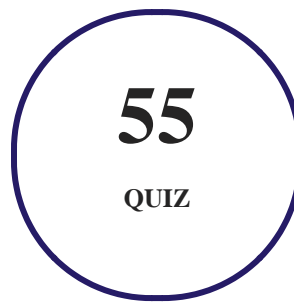
1. Pre-Assessment
2. Exercises, Quizzes, Flashcards & Glossary  
Number of Questions
3. Expert Instructor-Led Training
4. ADA Compliant & JAWS Compatible Platform
5. State of the Art Educator Tools
6. Award Winning Learning Platform (LMS)
7. Chapter & Lessons  
Syllabus  
Chapter 1: Preface  
Chapter 2: Fundamentals of the Internet of Things  
Chapter 3: IoT Architectures and Protocols  
Chapter 4: Programming Framework for IoT  
Chapter 5: Virtualization in IoT  
Chapter 6: Security, Privacy, and Challenges in IoT  
Chapter 7: IoT Applications Area: Emerging Application Areas of IoT  
Chapter 8: Integration of Cloud and IoT  
Chapter 9: Smart City Using IoT Integration  
Chapter 10: Internet of Things (IoT) Use Cases  
Videos and How To
8. Practice Test  
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Features
9. Performance Based labs  
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## 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. 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.



## 3. 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.

## 4. 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.

## 5. 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.

## 6. 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

## 7. 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: Fundamentals of the Internet of Things

- Introduction
- Characteristics of IoT
- The physical design of IoT
- IoT architecture and components
- Logical design of IoT
- Communication models
- IoT communication APIs
- Evaluating business impact and economics for IoT
- Conclusion
- Points to remember

- Descriptive questions

## Chapter 3: IoT Architectures and Protocols

- Introduction
- Taxonomy
- Three-layer and five-layer architecture of IoT
- Cloud and fog based architecture of IoT
- Representative architecture
- Near Field Communication (NFC)
- Wireless sensor network (WSN)
- IoT network protocol stack
- IoT technology stack
- Bluetooth, ZigBee, and 6LowPAN
- Points to remember
- Key terms
- Descriptive questions

## Chapter 4: Programming Framework for IoT

- Interoperability in IoT

- Programming paradigm
- Assembly
- Introduction to Arduino programming
- Introduction to Python programming
- Introduction to Raspberry Pi
- Implementation of IoT with Raspberry Pi
- Conclusion
- Points to remember
- Descriptive questions

## Chapter 5: Virtualization in IoT

- Introduction of virtualization technology
- Types of virtualization
- Virtualization and IoT
- Embedded virtualization
- IoT and embedded virtualization
- Conclusion
- Points to remember



- Descriptive questions

## Chapter 6: Security, Privacy, and Challenges in IoT

- Introduction
- Design challenges
- Development challenges
- Security challenges
- Privacy challenges
- Other challenges
- Trust management
- Conclusion
- Points to remember
- Descriptive questions

## Chapter 7: IoT Applications Area: Emerging Application Areas of IoT

- Introduction
- Homes (the smart home)
- Internet of Things (IoT) in healthcare

- Internet of Things (IoT) in agriculture
- IoT in military application
- Internet of Things (IoT) and politics
- Internet of Things (IoT) and constructions
- Internet of Things (IoT) and other application areas
- Conclusion
- Case studies
- Descriptive questions
- Reference

## Chapter 8: Integration of Cloud and IoT

- Introduction
- Cloud
- Internet of Things (IoT)
- Difference between cloud computing and IoT
- Integration of CloudIoT-the role of cloud computing in the IoT
- CloudIoT architecture: Service and deployment model
- Stages, administrations, and research ventures

- Challenges of CloudIoT
- Future scope
- Conclusion
- Exercise

## Chapter 9: Smart City Using IoT Integration

- Introduction
- Concept of smart city
- The emergence and definition of a smart city
- Dimensions and components of smart city initiatives
- Adoption of IoT in automation
- Design strategies
- Factors affecting automation using IoT
- Existing application areas
- IoT applications in smart cities
- Education
- Healthcare
- E-governance

- Industry
- Conclusion

## Chapter 10: Internet of Things (IoT) Use Cases

- Introduction
- Industrial Internet of Things (IIoT) use case
- IoT and smart energy
- Smart transportation
- Smart health
- Smart home and smart buildings
- Smart education system
- Governance use case
- Smart cities
- Conclusion
- Descriptive questions
- Reference

## Here's what you get

### 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.

## 9. Performance Based Labs

uCertify's performance-based labs are simulators that provides virtual environment. Labs deliver hands on experience with minimal risk and thus replace expensive physical labs. uCertify Labs are cloud-based, device-enabled and can be easily integrated with an LMS. Features of uCertify labs:

- Provide hands-on experience in a safe, online environment
- Labs simulate real world, hardware, software & CLI environment
- Flexible and inexpensive alternative to physical Labs
- Comes with well-organized component library for every task
- Highly interactive - learn by doing
- Explanations and remediation available
- Videos on how to perform

## Lab Tasks

Here's what you get

You can't stay away! Get

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