

uCertify

Course Outline

Fundamentals of IoT



04 Aug 2025

1. Exercises, Quizzes, Flashcards & Glossary

Number of Questions

2. Expert Instructor-Led Training

3. ADA Compliant & JAWS Compatible Platform

4. State of the Art Educator Tools

5. Award Winning Learning Platform (LMS)

6. Chapter & Lessons

Syllabus

Chapter 1: Preface

Chapter 2: Introduction to Internet of Things

Chapter 3: Hardware for IoT

Chapter 4: Embedded Platforms for IoT

Chapter 5: Programming the Arduino

Chapter 6: IoT and M2M Design Standards

Chapter 7: Network and Communication Aspects of IoT

Chapter 8: IoT Design Challenges

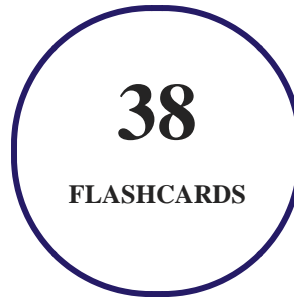
Chapter 9: Applications of IoT

Chapter 10: Appendix: Hands-On Practical Problems

Videos and How To

1.  **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.



2. 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.



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: Introduction to Internet of Things

- Introduction
- Internet of Things
- Conceptual framework
- Architectural view of IoT
- Technologies behind IoT
- Sources of IoT
- Questions

Chapter 3: Hardware for IoT

- Introduction
- Sensors
- Actuators
- Radio frequency identification technology
- Wireless sensor networks
- Participatory sensing technology
- Conclusion
- Questions

Chapter 4: Embedded Platforms for IoT

- Introduction
- Embedded system in IoT
- Challenges of IoT embedded software
- Embedded computing examples
- IoT-supported hardware platforms
- Conclusion
- Questions

Chapter 5: Programming the Arduino

- Introduction
- Overview of Arduino
- Anatomy of Arduino UNO
- Arduino IDE (a programming environment)
- Programming the Arduino
- Programming the Arduino for IoT
- Coding Arduino using emulator
- Arduino libraries
- Conclusion
- Questions

Chapter 6: IoT and M2M Design Standards

- Introduction
- M2M communication
- Applications of M2M communication
- Types of M2M communication
- Working of M2M communication

- IoT/M2M system layers
- IoT/M2M design standardization
- Communication technologies in IoT
- Data enrichment
- Data consolidation
- Ease of designing and affordability of IoT systems
- Conclusion
- Questions

Chapter 7: Network and Communication Aspects of IoT

- Introduction
- Architecture of IoT
- Network and communication aspects
- Protocols used in IoT
- Message Queuing Telemetry Transport
- Wireless medium access issues
- MAC protocol survey
- Sensor deployment

- Node discovery
- Data aggregation
- Data dissemination
- Conclusion
- Questions

Chapter 8: IoT Design Challenges

- Introduction
- IoT design challenges
- Development challenges of IoT
- Security challenges of IoT
- Application vulnerabilities
- Other challenges
- Conclusion
- Questions

Chapter 9: Applications of IoT

- Introduction
- Applications of IoT

- Smart metering
- Smart Health
- City automation
- Automotive applications
- Home automation
- Smart cards
- Communicating data with H/W units in IoT systems
- Designing smart street lights in smart city
- IoT in mobile devices
- Conclusion
- Questions

Chapter 10: Appendix: Hands-On Practical Problems

- Introduction
- Program 1- Code the Arduino for sensing temperature and humidity
- Program 2- Code the Arduino for connecting ultrasonic sensor
- Program 3- Code Arduino for connecting MQ2 gas sensor for detecting gases
- Program 4- Code Arduino for connecting Bluetooth module
- Program 5- Code Arduino for using a Wi-Fi module

- Program 6- Code Arduino for monitoring sensor data over the internet
- Program 7- Code Arduino for using a Wi-Fi module
- Program 8- Code Arduino for creating a local server
- Hardware required

You can't stay away! Get



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