

uCertify

Course Outline

Blockchain Basics



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: Introduction

Chapter 2: Thinking in Layers and Aspects

Chapter 3: Seeing the Big Picture

Chapter 4: Recognizing the Potential

Chapter 5: Discovering the Core Problem

Chapter 6: Disambiguating the Term

Chapter 7: Understanding the Nature of Ownership

Chapter 8: Spending Money Twice

Chapter 9: Planning the Blockchain

Chapter 10: Documenting Ownership

Chapter 11: Hashing Data

Chapter 12: Hashing in the Real World

Chapter 13: Identifying and Protecting User Accounts

Chapter 14: Authorizing Transactions

Chapter 15: Storing Transaction Data

Chapter 16: Using the Data Store

Chapter 17: Protecting the Data Store

Chapter 18: Distributing the Data Store Among Peers

Chapter 19: Verifying and Adding Transactions

Chapter 20: Choosing a Transaction History

Chapter 21: Paying for Integrity

Chapter 22: Bringing the Pieces Together

Chapter 23: Seeing the Limitations

Chapter 24: Reinventing the Blockchain

Chapter 25: Using the Blockchain

Chapter 26: Summarizing and Going Further

Videos and How To

1. 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.

2. 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.

3. 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.

4. 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

5. 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: Introduction

- Why Another course About the Blockchain?
- What You Cannot Expect from This course
- What You Can Expect from This course
- How This course Is Organized

Chapter 2: Thinking in Layers and Aspects

- The Metaphor
- Layers of a Software System
- Considering Two Layers at the Same Time
- Integrity
- Outlook
- Summary

Chapter 3: Seeing the Big Picture

- The Metaphor
- A Payment System
- Two Types of Software Architecture
- The Advantages of Distributed Systems

- The Disadvantages of Distributed Systems
- Distributed Peer-to-Peer Systems
- Mixing Centralized and Distributed Systems
- Identifying Distributed Systems
- The Purpose of the Blockchain
- Outlook
- Summary

Chapter 4: Recognizing the Potential

- The Metaphor
- How a Peer-to-Peer System Changed a Whole Industry
- The Potential of Peer-to-Peer Systems
- Terminology and the Link to the Blockchain
- The Potential of the Blockchain
- Outlook
- Summary

Chapter 5: Discovering the Core Problem

- The Metaphor

- Trust and Integrity in Peer-to-Peer Systems
- Integrity Threats in Peer-to-Peer Systems
- The Core Problem to Be Solved by the Blockchain
- Outlook
- Summary

Chapter 6: Disambiguating the Term

- The Term
- The Usage of the Term in This course
- Provisional Definition
- The Role of Managing Ownership
- The Application Area of the Blockchain in This Course
- Outlook
- Summary

Chapter 7: Understanding the Nature of Ownership

- The Metaphor
- Ownership and Witnesses
- Foundations of Ownership

- A Short Detour to Security
- Purposes and Properties of a Ledger
- Ownership and the Blockchain
- Outlook
- Summary

Chapter 8: Spending Money Twice

- The Metaphor
- The Double Spending Problem
- The Term
- How to Solve the Double Spending Problem
- The Usage of Double Spending in This course
- Outlook
- Summary

Chapter 9: Planning the Blockchain

- The Goal
- Starting Point
- The Path to Follow

- Outlook
- Summary

Chapter 10: Documenting Ownership

- The Metaphor
- The Goal
- The Challenge
- The Idea
- A Short Detour to Inventory and Transaction Data
- How It Works
- Why It Works
- Importance of Ordering
- Integrity of the Transaction History
- Outlook
- Summary

Chapter 11: Hashing Data

- The Metaphor
- The Goal

- How It Works
- Trying It Out Yourself
- Patterns of Hashing Data
- Outlook
- Summary

Chapter 12: Hashing in the Real World

- Comparing Data
- Detecting Changes in Data
- Referring to Data in a Change-Sensitive Manner
- Storing Data in a Change-Sensitive Manner
- Causing Time-Consuming Computations
- Usage of Hashing in the Blockchain
- Outlook
- Summary

Chapter 13: Identifying and Protecting User Accounts

- The Metaphor
- The Goal

- The Challenge
- The Idea
- A Short Detour to Cryptography
- Asymmetric Cryptography in the Real World
- Asymmetric Cryptography in the Blockchain
- Outlook
- Summary

Chapter 14: Authorizing Transactions

- The Metaphor
- The Goal
- The Challenge
- The Idea
- A Short Detour to Digital Signatures
- How It Works
- Why It Works
- Outlook
- Summary

Chapter 15: Storing Transaction Data

- The Metaphor
- The Goal
- The Challenge
- The Idea
- Transforming a Book into a Blockchain-Data-Structure
- The Blockchain-Data-Structure
- Storing Transactions in the Blockchain-DataStructure
- Outlook
- Summary

Chapter 16: Using the Data Store

- The Metaphor
- Adding New Transactions
- Detecting Changes
- Changing Data Orderly
- Intended vs. Unintended Changes
- Outlook

- Summary

Chapter 17: Protecting the Data Store

- The Metaphor
- The Goal
- The Challenge
- The Idea
- A Short Detour to Immutability
- How It Works: The Big Picture
- How It Works: The Details
- Why It Works
- The Costs of Manipulating the BlockchainData-Structure
- The Immutable Data Store in the Real World
- Outlook
- Summary

Chapter 18: Distributing the Data Store Among Peers

- The Metaphor
- The Goal

- The Challenge
- The Idea
- How It Works: The Overview1
- How It Works: The Details
- Why It Works
- Outlook
- Summary

Chapter 19: Verifying and Adding Transactions

- The Metaphor
- The Goal
- The Challenge
- The Idea
- How It Works: The Building Blocks
- How It Works: The Skeleton
- How It Works: The Details
- Why It Works
- Dealing with Dishonest Behavior
- Outlook

- Summary

Chapter 20: Choosing a Transaction History

- The Metaphor
- The Goal
- The Challenge
- The Idea
- How It Works
- Consequences of Selecting One Chain
- Threats to the Voting Schema
- The Role of the Hash Puzzle
- Why It Works
- Outlook
- Summary

Chapter 21: Paying for Integrity

- The Metaphor
- The Role of Fees Within the Blockchain
- Desirable Properties of an Instrument of Payment for Compensating Peers

- A Detour to the Emergence of Cryptographic Currencies
- Outlook
- Summary

Chapter 22: Bringing the Pieces Together

- Reviewing Concepts and Technologies
- What Is the Blockchain?
- Gaining Abstraction
- Outlook
- Summary

Chapter 23: Seeing the Limitations

- The Challenge
- Technical Limitations of the Blockchain
- Nontechnical Limitations of the Blockchain
- Overcoming the Limitations
- Outlook
- Summary

Chapter 24: Reinventing the Blockchain

- The Metaphor
- Conflicting Goals of the Blockchain
- The Roots of the Conflicts
- Solving the Conflicts
- Four Versions of the Blockchain
- Consequences
- Reviewing the Purpose of the Blockchain
- The Usage of the Term Blockchain in the Remainder of This course
- Outlook
- Summary

Chapter 25: Using the Blockchain

- The Metaphor
- Characteristics of the Blockchain
- Generic Application Patterns
- Specific Use Cases
- Analyzing Blockchain Applications
- Outlook

- Summary

Chapter 26: Summarizing and Going Further

- The Metaphor
- Further Developments and Alternatives
- Major Accomplishments of the Blockchain
- Possible Disadvantages
- The Future
- Outlook
- Summary

You can't stay away! Get



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