uCertify

Course Outline

Computer Science



28 Mar 2024

1. Course Objective
2. Pre-Assessment
3. Exercises, Quizzes, Flashcards & Glossary

   Number of Questions
4. Expert Instructor-Led Training
5. ADA Compliant & JAWS Compatible Platform
6. State of the Art Educator Tools
7. Award Winning Learning Platform (LMS)
8. Chapter & Lessons

Syllabus

Chapter 1: Introduction

Chapter 2: Data Storage

Chapter 3: Data Manipulation

Chapter 4: Operating Systems

Chapter 5: Networking and the Internet

Chapter 6: Algorithms

Chapter 7: Programming Languages

Chapter 8: Software Engineering

Chapter 9: Data Abstractions

Chapter 10: Database Systems

Chapter 11: Computer Graphics

Chapter 12: Artificial Intelligence

Chapter 13: Theory of Computation

Chapter 14: Appendix A: ASCII

Chapter 15: Appendix B: Circuits to Manipulate Two’s Complement Representations

Chapter 16: Appendix C: Vole: A Simple Machine Language

Chapter 17: Appendix D: High-Level Programming Languages

Chapter 18: Appendix E: The Equivalence of Iterative and Recursive Structures

Videos and How To

9. Practice Test

    Here's what you get

    Features

10. Performance Based labs

    Lab Tasks

    Here's what you get

11. Post-Assessment

1. Course Objective

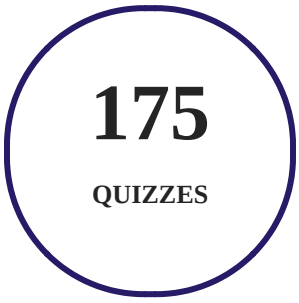
The Computer Science course and lab provide an introductory survey of computer science. The lab simulates real-world, hardware, software, and command-line interface environments and can be mapped to any text-book, course, or training. The computer science for beginners course and lab cover the dimensions of the subject such as Data storage and manipulation; operating systems, networking and the Internet; algorithms, programming languages, software engineering, database systems, computer graphics, and more.

2. 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.

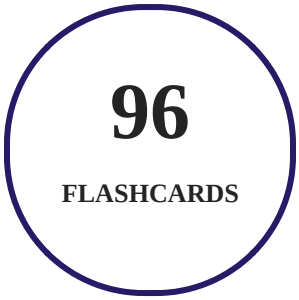
3. Quizzes

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.



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: Introduction

- The Role of Algorithms
- The History of Computing
- An Outline of Our Study
- The Overarching Themes of Computer Science

Chapter 2: Data Storage

- Bits and Their Storage
- Main Memory

- Mass Storage
- Representing Information as Bit Patterns
- The Binary System
- Storing Integers
- Storing Fractions
- Data and Programming
- Data Compression
- Communication Errors

Chapter 3: Data Manipulation

- Computer Architecture
- Machine Language
- Program Execution
- Arithmetic/Logic Instructions
- Communicating with Other Devices
- Programming Data Manipulation
- Other Architectures

Chapter 4: Operating Systems

- The History of Operating Systems
- Operating System Architecture
- Coordinating the Machine’s Activities
- Handling Competition Among Processes
- Security

Chapter 5: Networking and the Internet

- Network Fundamentals
- The Internet
- The World Wide Web
- Internet Protocols
- Simple Client Server
- Cybersecurity

Chapter 6: Algorithms

- The Concept of an Algorithm
- Algorithm Representation
- Algorithm Discovery

- Iterative Structures
- Recursive Structures
- Efficiency and Correctness

Chapter 7: Programming Languages

- Historical Perspective
- Traditional Programming Concepts
- Procedural Units
- Language Implementation
- Object-Oriented Programming
- Programming Concurrent Activities
- Declarative Programming

Chapter 8: Software Engineering

- The Software Engineering Discipline
- The Software Life Cycle
- Software Engineering Methodologies
- Modularity
- Tools of the Trade

- Quality Assurance
- Documentation
- The Human-Machine Interface
- Software Ownership and Liability

Chapter 9: Data Abstractions

- Basic Data Structures
- Related Concepts
- Implementing Data Structures
- A Short Case Study
- Customized Data Types
- Classes and Objects
- Pointers in Machine Language

Chapter 10: Database Systems

- Database Fundamentals
- The Relational Model
- Object-Oriented Databases

- Maintaining Database Integrity
- Traditional File Structures
- Data Mining
- Social Impact of Database Technology

Chapter 11: Computer Graphics

- The Scope of Computer Graphics
- Overview of 3D Graphics
- Modeling
- Rendering
- Dealing with Global Lighting
- Animation

Chapter 12: Artificial Intelligence

- Intelligence and Machines
- Perception
- Reasoning
- Additional Areas of Research
- Artificial Neural Networks

- Robotics
- Considering the Consequences

Chapter 13: Theory of Computation

- Functions and Their Computation
- Turing Machines
- Universal Programming Languages
- A Noncomputable Function
- Complexity of Problems
- Public-Key Cryptography

Chapter 14: Appendix A: ASCII

Chapter 15: Appendix B: Circuits to Manipulate Two’s Complement Representations

Chapter 16: Appendix C: Vole: A Simple Machine Language

- The Vole Architecture1
- The Vole’s Machine Language

Chapter 17: Appendix D: High-Level Programming Languages

- Ada
- C
- C++
- C#
- Fortran
- Java

Chapter 18: Appendix E: The Equivalence of Iterative and Recursive Structures

11. Practice Test

Here's what you get

118	118
PRE-ASSESSMENTS QUESTIONS	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.  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

- Understanding Boolean Operations
- Using the ASCII Code
- Using the Floating-Point Notation
- Using Logic Operations
- Understanding Input and Output
- Understanding Operating System Architecture
- Understanding Hyperlinks

- Using the Headings
- Understanding Functions
- Using Variables and Data Types
- Using Logical Deduction
- Understanding the software life cycle
- Using Arrays
- Using Database Systems
- Understanding Computer Graphics
- Understanding Artificial Neural Networks
- Understanding Universal Programming Languages

Here's what you get

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PERFORMANCE BASED LAB

13. 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.

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