uCertify

Course Outline

tarting out with Programming Logic & Design

21 May 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

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Chapter 2: Introduction to Computers and Programming

Chapter 3: Input, Processing, and Output

Chapter 4: Modules

Chapter 5: Decision Structures and Boolean Logic

Chapter 6: Repetition Structures

Chapter 7: Functions

Chapter 8: Input Validation

Chapter 9: Arrays

Chapter 10: Sorting and Searching Arrays

Chapter 11: Files

Chapter 12: Menu-Driven Programs

Chapter 13: Text Processing

Chapter 14: Recursion

Chapter 15: Object-Oriented Programming

Chapter 16: GUI Applications and Event-Driven Programming

Chapter 17: Appendix A: ASCII/Unicode Characters

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Chapter 19: Appendix C: Pseudocode Reference

Chapter 20: Appendix D: Converting Decimal Numbers to Binary

Videos and How To

9. Practice Test

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   Features

10. Live labs

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11. Post-Assessment

1. Course Objective

Get hands-on experience in complex programming with the Programming Logic & Design course and lab. The course provides a vivid introduction to current programming languages with clear and approachable code snippets and programs for better understanding. The course and lab offer easy-to-understand pseudocode, flowcharts, and other tools. It illustrates how to design the logic of programs with a firm emphasis on logical thought processes and models. Programming Logic & Design uses a language-independent approach to teach programming concepts and problem-solving skills.

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. Exercises

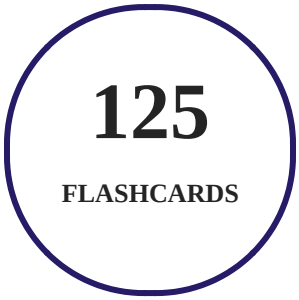
There is no limit to the number of times learners can attempt these. Exercises come with detailed remediation, which ensures that learners are confident on the topic before proceeding.

4. 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.

5. 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.



6. 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.

7. 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.

8. 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.

9. 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.

10. 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

11. 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

- Changes in the Fifth Edition
- Brief Overview of Each Lesson
- Organization of the Text

- Features of the Text

Chapter 2: Introduction to Computers and Programming

- Introduction
- Hardware
- How Computers Store Data
- How a Program Works
- Types of Software
- Review Questions

Chapter 3: Input, Processing, and Output

- Designing a Program
- Output, Input, and Variables
- Variable Assignment and Calculations
- Variable Declarations and Data Types
- Named Constants
- Hand Tracing a Program
- Documenting a Program

- Designing Your First Program
- Focus on Languages: Java, Python, and C++
- Review Questions
- Debugging Exercises
- Programming Exercises

Chapter 4: Modules

- Introduction to Modules
- Defining and Calling a Module
- Local Variables
- Passing Arguments to Modules
- Global Variables and Global Constants
- Focus on Languages: Java, Python, and C++
- Review Questions
- Debugging Exercises
- Programming Exercises

Chapter 5: Decision Structures and Boolean Logic

- Introduction to Decision Structures

- Dual Alternative Decision Structures
- Comparing Strings
- Nested Decision Structures
- The Case Structure
- Logical Operators
- Boolean Variables
- Focus on Languages: Java, Python, and C++
- Review Questions
- Debugging Exercises
- Programming Exercises

Chapter 6: Repetition Structures

- Introduction to Repetition Structures
- Condition-Controlled Loops: While, Do-While, and Do-Until
- Count-Controlled Loops and the For Statement
- Calculating a Running Total
- Sentinels
- Nested Loops

- Focus on Languages: Java, Python, and C++
- Review Questions
- Debugging Exercises
- Programming Exercises

Chapter 7: Functions

- Introduction to Functions: Generating Random Numbers
- Writing Your Own Functions
- More Library Functions
- Focus on Languages: Java, Python, and C++
- Review Questions
- Debugging Exercises
- Programming Exercises

Chapter 8: Input Validation

- Garbage In, Garbage Out
- The Input Validation Loop
- Defensive Programming

- Focus on Languages: Java, Python, and C++
- Review Questions
- Debugging Exercises
- Programming Exercises

Chapter 9: Arrays

- Array Basics
- Sequentially Searching an Array
- Processing the Contents of an Array
- Parallel Arrays
- Two-Dimensional Arrays
- Arrays of Three or More Dimensions
- Focus on Languages: Java, Python, and C++
- Review Questions
- Debugging Exercises
- Programming Exercises

Chapter 10: Sorting and Searching Arrays

- The Bubble Sort Algorithm

- The Selection Sort Algorithm
- The Insertion Sort Algorithm
- The Binary Search Algorithm
- Review Questions
- Debugging Exercise
- Programming Exercises

Chapter 11: Files

- Introduction to File Input and Output
- Using Loops to Process Files
- Using Files and Arrays
- Processing Records
- Control Break Logic
- Focus on Languages: Java, Python, and C++
- Review Questions
- Debugging Exercises
- Programming Exercises

Chapter 12: Menu-Driven Programs

- Introduction to Menu-Driven Programs
- Modularizing a Menu-Driven Program
- Using a Loop to Repeat the Menu
- Multiple-Level Menus
- Focus on Languages: Java, Python, and C++
- Review Questions

Chapter 13: Text Processing

- Introduction
- Character-by-Character Text Processing
- Focus on Languages: Java, Python, and C++
- Review Questions
- Debugging Exercises
- Programming Exercises

Chapter 14: Recursion

- Introduction to Recursion
- Problem Solving with Recursion

- Examples of Recursive Algorithms
- Focus on Languages: Java, Python, and C++
- Review Questions
- Programming Exercises

Chapter 15: Object-Oriented Programming

- Procedural and Object-Oriented Programming
- Classes
- Using the Unified Modeling Language to Design Classes
- Finding the Classes and Their Responsibilities in a Problem
- Inheritance
- Polymorphism
- Focus on Languages: Java, Python, and C++
- Review Questions
- Programming Exercises

Chapter 16: GUI Applications and Event-Driven Programming

- Graphical User Interfaces
- Designing the User Interface for a GUI Program

- Writing Event Handlers
- Designing Apps For Mobile Devices
- Focus on Languages: Java, Python, and C++
- Review Questions
- Programming Exercises

Chapter 17: Appendix A: ASCII/Unicode Characters

Chapter 18: Appendix B: Flowchart Symbols

Chapter 19: Appendix C: Pseudocode Reference

Chapter 20: Appendix D: Converting Decimal Numbers to Binary

Videos and How To

uCertify course includes videos to help understand concepts. It also includes How Tos that help learners in accomplishing certain tasks.

35	04:16
VIDEOS	HOURS

12. Practice Test

Here's what you get

100	100
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.

13. Live Labs

The benefits of live-labs are:

- Exam based practical tasks
- Real equipment, absolutely no simulations

- Access to the latest industry technologies
- Available anytime, anywhere on any device
- Break and Reset functionality
- No hardware costs

Lab Tasks

Introduction to Computers and Programming

Input, Processing, and Output

- Creating a Flowchart for a Degree Program
- Creating a Pedometer Calculator
- Calculating Average

Modules

- Creating a Flowchart to Calculate Sales Tax
- Creating a Flowchart to Display Monthly Sales
- Using the if Statement
- Calculating the Retail Company's Tax Using Python
- Using the Python Conditional Statement
- Using Python Variables
- Using Python Functions

Decision Structures and Boolean Logic

- Creating a Flowchart to Display Store and Employee Bonuses
- Calculating the Total Meal Price Using the Python Operator
- Calculating the Retail Company's Bonus Using Python

Repetition Structures

- Creating a Flowchart Using Condition-Controlled Loops
- Creating a Flowchart to Print Seconds Using the Count-Controlled Loop
- Calculating Average Test Scores
- Using the for Statement

Functions

- Creating a Flowchart Using the RANDOM Function
- Solving Equations Using Python
- Creating a Dice Game

Input Validation

- Creating a Flowchart to Calculate the Average Test Score
- Calculating Call Over Minutes

Arrays

- Creating a Flowchart for the Blood Drive Program
- Calculating the Energy Savings Cost
- Creating the Blood Drive Program

Sorting and Searching Arrays

- Implementing Bubble Sort
- Implementing Selection Sort
- Implementing Insertion Sort
- Implementing Binary Sort

Files

Menu-Driven Programs

- Creating a Menu-Driven Program in Java

Text Processing

- Replacing Variables in C++

Recursion

- Creating a Recursive Function in Java

Object-Oriented Programming

- Creating an Object of the Class

GUI Applications and Event-Driven Programming

- Creating a German Translator

Here's what you get

34	9	45
LIVE LABS	VIDEO TUTORIALS	MINUTES

14. 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.