uCertify

Course Outline

Python All-in-One

18 May 2024

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3. Expert Instructor-Led Training
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   Chapter 3: Interactive Mode, Getting Help, and Writing Apps

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Chapter 28: Introducing Robotics

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Videos and How To

8. Live labs

Lab Tasks

Here's what you get

1. Course Objective

The Python All-in-One course is designed to provide you with a solid foundation in Python, enabling you to develop a wide range of applications and solutions. The course helps you to learn the basics of Python programming, including data types, variables, and control structures and dive into advanced topics like data structures, algorithms, and object-oriented programming. The course helps you gain a strong foundation in Python programming, enabling you to develop a wide range of applications and solutions.

2. 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.

3. 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.

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

- About This Course
- What to Buy
- Icons Used in This Course
- Where to Go from Here

Chapter 2: Starting with Python

- Why Python Is Hot

- Choosing the Right Python
- Tools for Success
- Writing Python in VS Code
- Using Jupyter Notebook for Coding

Chapter 3: Interactive Mode, Getting Help, and Writing Apps

- Using Python's Interactive Mode
- Creating a Python Development Workspace
- Creating a Folder for Your Python Code
- Typing, Editing, and Debugging Python Code
- Writing Code in a Jupyter Notebook

Chapter 4: Python Elements and Syntax

- The Zen of Python
- Introducing Object-Oriented Programming
- Discovering Why Indentations Count, Big Time
- Using Python Modules

Chapter 5: Building Your First Python Application

- Opening the Python App File
- Typing and Using Python Comments
- Understanding Python Data Types
- Working with Python Operators
- Creating and Using Variables
- Understanding What Syntax Is and Why It Matters
- Putting Code Together

Chapter 6: Working with Numbers, Text, and Dates

- Calculating Numbers with Functions
- Still More Math Functions
- Formatting Numbers
- Grappling with Weirder Numbers
- Manipulating Strings
- Uncovering Dates and Times
- Accounting for Time Zones
- Working with Time Zones

Chapter 7: Controlling the Action

- Main Operators for Controlling the Action
- Making Decisions with if
- Repeating a Process with for
- Looping with while

Chapter 8: Speeding Along with Lists and Tuples

- Defining and Using Lists
- What's a Tuple and Who Cares?
- Working with Sets

Chapter 9: Cruising Massive Data with Dictionaries

- Understanding Data Dictionaries
- Creating a Data Dictionary
- Looping through a Dictionary
- Data Dictionary Methods
- Copying a Dictionary
- Deleting Dictionary Items
- Having Fun with Multi-Key Dictionaries

Chapter 10: Wrangling Bigger Chunks of Code

- Creating a Function
- Commenting a Function
- Passing Information to a Function
- Returning Values from Functions
- Unmasking Anonymous Functions

Chapter 11: Doing Python with Class

- Mastering Classes and Objects
- Creating a Class
- Creating an Instance from a Class
- Giving an Object Its Attributes
- Giving a Class Methods
- Understanding Class Inheritance

Chapter 12: Sidestepping Errors

- Understanding Exceptions
- Handling Errors Gracefully

- Being Specific about Exceptions
- Keeping Your App from Crashing
- Adding an else to the Mix
- Using try … except … else … finally
- Raising Your Own Exceptions

Chapter 13: Working with External Files

- Understanding Text and Binary Files
- Opening and Closing Files
- Reading a File’s Contents
- Looping through a File
- Reading and Copying a Binary File
- Conquering CSV Files
- Converting from CSV to Objects and Dictionaries

Chapter 14: Juggling JSON Data

- Organizing JSON Data
- Understanding Serialization
- Loading Data from JSON Files

- Dumping Python Data to JSON

Chapter 15: Interacting with the Internet

- Seeing How the Web Works

Chapter 16: Libraries, Packages, and Modules

- Understanding the Python Standard Library
- Exploring Python Packages
- Importing Python Modules
- Making Your Own Modules

Chapter 17: Exploring Artificial Intelligence

- AI Is a Collection of Techniques
- Current Limitations of AI

Chapter 18: Building a Neural Network

- Understanding Neural Networks
- Building a Simple Neural Network in Python
- Building a Python Neural Network in TensorFlow

Chapter 19: Doing Machine Learning

- Learning by Looking for Solutions in All the Wrong Places
- Creating a Machine-Learning Network for Detecting Clothes Types
- Visualizing with MatPlotLib
- Learning More Machine Learning

Chapter 20: Exploring AI

- Limitations of the Raspberry Pi and AI
- Adding Hardware AI to the Raspberry Pi
- AI in the Cloud
- AI on a Graphics Card
- Where to Go for More AI Fun in Python

Chapter 21: Understanding the Five Areas of Data Science

- Working with Big, Big Data
- Cooking with Gas: The Five-Step Process of Data Science

Chapter 22: Exploring Big Data

- Introducing NumPy, Pandas, and MatPlotLib

- Doing Your First Data Science Project

Chapter 23: Using Big Data from Google Cloud

- What Is Big Data?
- Understanding Google Cloud and BigQuery
- Reading the Medicare Big Data
- Looking for the Most Polluted City in the World on an Hourly Basis

Chapter 24: Introducing Physical Computing

- Physical Computing Is Fun
- What Is a Raspberry Pi?
- Building Projects That Move and Sense the Environment
- Sensing the Environment with the Raspberry Pi
- Controlling an LED with Python
- But Wait, There's More

Chapter 25: No Soldering! Using Grove Connectors for Building

- Working with the Grove System
- Grove Connectors

- Connecting with Grove Cables

Chapter 26: Sensing the World

- Understanding I2C
- Measuring Oxygen and a Flame
- Building a Dashboard on Your Phone with Blynk
- Where to Go from Here

Chapter 27: Making Things Move

- Exploring Electric Motors
- Controlling a DC Motor
- Running a Servo Motor
- Making a Stepper Motor Step

Chapter 28: Introducing Robotics

- A Robot Is Not Always Like a Human
- Not Every Robot Has Arms or Wheels
- Understanding the Main Parts of a Robot
- Programming Robots

Chapter 29: Building Your First Python Robot

- Introducing the Mars Rover PiCar-B
- Assembling the Robot
- Testing Your Robot

Chapter 30: Programming Your Robot Rover

- Building a Simple, High-Level Python Interface
- Making a Single Move with Python
- Functions of the RobotInterface Class
- The Python Robot Interface Test
- Coordinating Motor Movements with Sensors
- Making a Python Brain for Our Robot
- Overview of the Included Adeept Software
- Where to Go from Here

Chapter 31: Using Artificial Intelligence in Robotics

- This Lesson’s Projects: Going to the Dogs
- Setting Up the First Project

- Machine Learning Using TensorFlow
- Testing the Trained Network
- Taking Cats and Dogs to Our Robot
- Setting Up the Second Project
- The FindAndChaseTheBall.py Python Program
- The Main Program
- AI and the Future of Robotics

11. 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

Interactive Mode, Getting Help, and Writing Apps

- Getting Started with Visual Studio Code
- Getting Started with Jupyter Notebook

Python Elements and Syntax

- Generating a Random Integer

Building Your First Python Application

- Using Boolean Operators
- Working with Escape Characters
- Using Arithmetic Operators
- Using Variable Assignment

Working with Numbers, Text, and Dates

- Using the round() Function
- Printing the Absolute Value
- Calculating the Square Root
- Converting the Decimal Number to Binary, Octal, and Hexadecimal
- Manipulating Strings Using the strip() Method

Controlling the Action

- Using Conditional Statements
- Using the for Loop
- Using Nested Loops
- Using the while Loop

Speeding Along with Lists and Tuples

- Working with Lists
- Working with Tuples

Cruising Massive Data with Dictionaries

- Working with Dictionaries

Wrangling Bigger Chunks of Code

- Working with Functions
- Using a lambda Expression

Doing Python with Class

- Working with Classes

Sidestepping Errors

- Creating the Custom Exception Class

Working with External Files

- Opening and Reading a File
- Opening a CSV File

Juggling JSON Data

- Loading Data from JSON Files
- Dumping Python Data to JSON

Interacting with the Internet

- Opening a URL

Libraries, Packages, and Modules

- Using the math Module

Building a Neural Network

- Creating an Activation Function
- Exploring a Two-Layer Neural Network using NumPy
- Training and Evaluating a Model in TensorFlow
- Exploring a Two-Layer Neural Network using TensorFlow

Doing Machine Learning

- Creating Convolutional Neural Network
- Training and Evaluating a Network in Machine Learning

Exploring Big Data

- Visualizing the Diamonds Dataset using MatPlotLib Library
- Working with the Diamonds Dataset
- Using the Pandas Library
- Creating a Correlation Heat Chart

Introducing Physical Computing

- Controlling an LED

No Soldering! Using Grove Connectors for Building

- Simulating Traffic Light System Optimization

Making Things Move

- Controlling a Stepper Motor
- Controlling a DC Motor

Building Your First Python Robot

- Controlling a Servo Motor

Using Artificial Intelligence in Robotics

- Training a CNN Model Using the Image Dataset

Here's what you get

45	45	01:20
LIVE LABS	VIDEO TUTORIALS	HOURS

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