uCertify

Course Outline

Foundational Python for Data Science

05 Jul 2024

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1. Course Objective

Python language has been around for a long time and has worn many hats. Its applications include everything from web development, to film, government, science, and business. You can gain a hands-on experience in Python for Data Science with uCertify's course Foundational Python for Data Science. This course will not teach the Python needed to set up a web page or perform system administration. It is also not intended to teach you Data Science, but rather the Python needed to learn Data Science. It has well-descriptive interactive lessons containing knowledge checks, quizzes, flashcards, and glossary terms to get a detailed understanding of Python needed to learn Data Science.

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

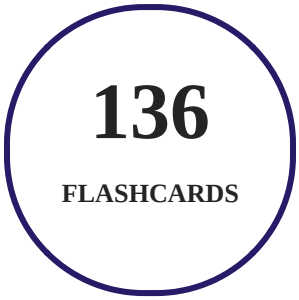
There is no limit to the number of times learners can attempt these. Exercises come with detailed remediation, which ensures that learners are confident on the topic before proceeding.

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: Introduction

- About This eBook

Chapter 2: Introduction to Notebooks

- Running Python Statements
- Jupyter Notebooks
- Google Colab
- Summary
- Questions

Chapter 3: Fundamentals of Python

- Basic Types in Python
- Performing Basic Math Operations
- Using Classes and Objects with Dot Notation
- Summary
- Questions

Chapter 4: Sequences

- Shared Operations
- Lists and Tuples
- Strings
- Ranges
- Summary

- Questions

Chapter 5: Other Data Structures

- Dictionaries
- Sets
- Frozensets
- Summary
- Questions

Chapter 6: Execution Control

- Compound Statements
- if Statements
- while Loops
- for Loops
- break and continue Statements
- Summary
- Questions

Chapter 7: Functions

- Defining Functions
- Scope in Functions
- Decorators
- Anonymous Functions
- Summary
- Questions

Chapter 8: NumPy

- Installing and Importing NumPy
- Creating Arrays
- Indexing and Slicing
- Element-by-Element Operations
- Filtering Values
- Views Versus Copies
- Some Array Methods
- Broadcasting
- NumPy Math
- Summary

- Questions

Chapter 9: SciPy

- SciPy Overview
- The scipy.misc Submodule
- The scipy.special Submodule
- The scipy.stats Submodule
- Summary
- Questions

Chapter 10: Pandas

- About DataFrames
- Creating DataFrames
- Interacting with DataFrame Data
- Manipulating DataFrames
- Manipulating Data
- Interactive Display
- Summary

- Questions

Chapter 11: Visualization Libraries

- matplotlib
- Seaborn
- Plotly
- Bokeh
- Other Visualization Libraries
- Summary
- Questions

Chapter 12: Machine Learning Libraries

- Popular Machine Learning Libraries
- How Machine Learning Works
- Learning More About Scikit-learn
- Summary
- Questions

Chapter 13: Natural Language Toolkit

- NLTK Sample Texts
- Frequency Distributions
- Text Objects
- Classifying Text
- Summary
- Questions

Chapter 14: Functional Programming

- Introduction to Functional Programming
- List Comprehensions
- Generators
- Summary
- Questions

Chapter 15: Object-Oriented Programming

- Grouping State and Function
- Special Methods
- Inheritance
- Summary

- Questions

Chapter 16: Other Topics

- Sorting
- Reading and Writing Files
- datetime Objects
- Regular Expressions
- Summary
- Questions

12. Practice Test

Here's what you get

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PRE-ASSESSMENTS QUESTIONS	FULL LENGTH TESTS	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. 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

- Computing Leaves of an Employee
- Calculating Expenses Using Multiple Statements
- Performing Shared Operations
- Adding and Removing Items

- Performing Data Analysis
- Accessing, Adding, and Updating Data by Using Keys
- Performing Set Operations
- Using Frozensets
- Determining if a Person is Eligible to Vote
- Determining Average and Grades Using Scores of Subjects
- Computing the Factorial of a Number
- Displaying the Number of Transactions
- Accessing Library Data
- Using the lambda Function
- Visualizing Data Using the reshape Method
- Computing Mathematical Data
- Performing Matrix Operations on NumPy Data
- Executing Image Processing
- Performing Customer Analysis
- Storing Employee Details
- Manipulating Employee Details
- Updating Student Data
- Visualizing Survey Data
- Creating a Styling Plot
- Analyzing Statistical Data
- Visualizing Tips According to the Total Bill
- Modifying Data Using Transformation
- Finding the Frequency of Words
- Modifying Outer Scope
- Changing Mutable Data
- Using Inheritance
- Sorting Data
- Demonstrating Regular Expressions

Here's what you get

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PERFORMANCE BASED LAB

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.

GET IN TOUCH:

3187 Independence Drive
Livermore, CA 94551,
United States

+1-415-763-6300

support@ucertify.com

www.ucertify.com