uCertify

Course Outline

Python® for Data Science for Beginners

19 May 2024

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

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

   Syllabus

   Chapter 1: Introduction

   Chapter 2: Discovering the Match between Data Science and Python

   Chapter 3: Introducing Python’s Capabilities and Wonders

   Chapter 4: Setting Up Python for Data Science

   Chapter 5: Working with Google Colab

   Chapter 6: Understanding the Tools

   Chapter 7: Working with Real Data

   Chapter 8: Conditioning Your Data

   Chapter 9: Shaping Data

   Chapter 10: Putting What You Know in Action

   Chapter 11: Getting a Crash Course in MatPlotLib

   Chapter 12: Visualizing the Data

   Chapter 13: Stretching Python’s Capabilities

   Chapter 14: Exploring Data Analysis

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   Chapter 17: Detecting Outliers in Data

   Chapter 18: Exploring Four Simple and Effective Algorithms

   Chapter 19: Performing Cross-Validation, Selection, and Optimization

Chapter 20: Increasing Complexity with Linear and Nonlinear Tricks

Chapter 21: Understanding the Power of the Many

Chapter 22: Ten Essential Data Resources

Chapter 23: Ten Data Challenges You Should Take

Videos and How To

8. Practice Test

   Here's what you get

   Features

9. Live labs

   Lab Tasks

   Here's what you get

1. Pre-Assessment

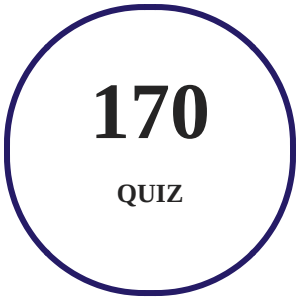
Pre-Assessment lets you identify the areas for improvement before you start your prep. It determines what students know about a topic before it is taught and identifies areas for improvement with question assessment before beginning the course.

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.

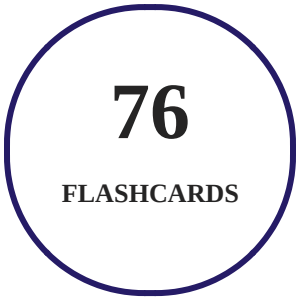
3. Quiz

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
- False Assumptions
- Icons Used in This Course

- Where to Go from Here

Chapter 2: Discovering the Match between Data Science and Python

- Defining the Sexiest Job of the 21st Century
- Creating the Data Science Pipeline
- Understanding Python’s Role in Data Science
- Learning to Use Python Fast

Chapter 3: Introducing Python’s Capabilities and Wonders

- Why Python?
- Working with Python
- Performing Rapid Prototyping and Experimentation
- Considering Speed of Execution
- Visualizing Power
- Using the Python Ecosystem for Data Science

Chapter 4: Setting Up Python for Data Science

- Considering the Off-the-Shelf Cross-Platform Scientific Distributions
- Installing Anaconda on Windows

- Installing Anaconda on Linux
- Installing Anaconda on Mac OS X
- Downloading the Datasets and Example Code

Chapter 5: Working with Google Colab

- Defining Google Colab
- Getting a Google Account
- Working with Notebooks
- Performing Common Tasks
- Using Hardware Acceleration
- Executing the Code
- Viewing Your Notebook
- Sharing Your Notebook
- Getting Help

Chapter 6: Understanding the Tools

- Using the Jupyter Console
- Using Jupyter Notebook

- Performing Multimedia and Graphic Integration

Chapter 7: Working with Real Data

- Uploading, Streaming, and Sampling Data
- Accessing Data in Structured Flat-File Form
- Sending Data in Unstructured File Form
- Managing Data from Relational Databases
- Interacting with Data from NoSQL Databases
- Accessing Data from the Web

Chapter 8: Conditioning Your Data

- Juggling between NumPy and pandas
- Validating Your Data
- Manipulating Categorical Variables
- Dealing with Dates in Your Data
- Dealing with Missing Data
- Slicing and Dicing: Filtering and Selecting Data
- Concatenating and Transforming
- Aggregating Data at Any Level

Chapter 9: Shaping Data

- Working with HTML Pages
- Working with Raw Text
- Using the Bag of Words Model and Beyond
- Working with Graph Data

Chapter 10: Putting What You Know in Action

- Contextualizing Problems and Data
- Considering the Art of Feature Creation
- Performing Operations on Arrays

Chapter 11: Getting a Crash Course in MatPlotLib

- Starting with a Graph
- Setting the Axis, Ticks, Grids
- Defining the Line Appearance
- Using Labels, Annotations, and Legends

Chapter 12: Visualizing the Data

- Choosing the Right Graph
- Creating Advanced Scatterplots
- Plotting Time Series
- Plotting Geographical Data
- Visualizing Graphs

Chapter 13: Stretching Python’s Capabilities

- Playing with Scikit-learn
- Performing the Hashing Trick
- Considering Timing and Performance
- Running in Parallel on Multiple Cores

Chapter 14: Exploring Data Analysis

- The EDA Approach
- Defining Descriptive Statistics for Numeric Data
- Counting for Categorical Data
- Creating Applied Visualization for EDA
- Understanding Correlation
- Modifying Data Distributions

Chapter 15: Reducing Dimensionality

- Understanding SVD
- Performing Factor Analysis and PCA
- Understanding Some Applications

Chapter 16: Clustering

- Clustering with K-means
- Performing Hierarchical Clustering
- Discovering New Groups with DBScan

Chapter 17: Detecting Outliers in Data

- Considering Outlier Detection
- Examining a Simple Univariate Method
- Developing a Multivariate Approach

Chapter 18: Exploring Four Simple and Effective Algorithms

- Guessing the Number: Linear Regression
- Moving to Logistic Regression

- Making Things as Simple as Naïve Bayes
- Learning Lazily with Nearest Neighbors

Chapter 19: Performing Cross-Validation, Selection, and Optimization

- Pondering the Problem of Fitting a Model
- Cross-Validating
- Selecting Variables Like a Pro
- Pumping Up Your Hyperparameters

Chapter 20: Increasing Complexity with Linear and Nonlinear Tricks

- Using Nonlinear Transformations
- Regularizing Linear Models
- Fighting with Big Data Chunk by Chunk
- Understanding Support Vector Machines
- Playing with Neural Networks

Chapter 21: Understanding the Power of the Many

- Starting with a Plain Decision Tree
- Making Machine Learning Accessible

- Boosting Predictions

Chapter 22: Ten Essential Data Resources

- Discovering the News with Subreddit
- Getting a Good Start with KDnuggets
- Locating Free Learning Resources with Quora
- Gaining Insights with Oracle’s Data Science Blog
- Accessing the Huge List of Resources on Data Science Central
- Learning New Tricks from the Aspirational Data Scientist
- Obtaining the Most Authoritative Sources at Udacity
- Receiving Help with Advanced Topics at Conductrics
- Obtaining the Facts of Open Source Data Science from Masters
- Zeroing In on Developer Resources with Jonathan Bower

Chapter 23: Ten Data Challenges You Should Take

- Meeting the Data Science London + Scikit-learn Challenge
- Predicting Survival on the Titanic
- Finding a Kaggle Competition that Suits Your Needs
- Honing Your Overfit Strategies

- Trudging Through the MovieLens Dataset
- Getting Rid of Spam E-mails
- Working with Handwritten Information
- Working with Pictures
- Analyzing Amazon.com Reviews
- Interacting with a Huge Graph

11. Practice Test

Here's what you get

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. 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

Conditioning Your Data

- Checking the Version of Pandas
- Creating Categorical Variables
- Finding the Missing Data
- Encoding Missingness
- Sorting and Shuffling
- Creating n-grams
- Calculating TF-IDF
- Modifying Graphs Using NetworkX
- Creating an Adjacency Matrix Using NetworkX
- Defining a Plot
- Creating a Line Plot
- Creating a Legend
- Creating a Pie Chart
- Creating a Scatterplot

- Creating an Undirected Graph
- Using Parallel Coordinates
- Calculating Descriptive Statistics
- Visualizing the Validation Curve
- Visualizing a Subset of Images
- Adding New Cases and Variables

Shaping Data

- Extracting a Telephone Number

Putting What You Know in Action

- Using Vectorization
- Performing Matrix Multiplication

Stretching Python's Capabilities

- Building a Predictor

Exploring Data Analysis

- Loading the Iris Dataset

Reducing Dimensionality

- Creating a Numpy Array

Clustering

- Understanding Centroid-Based Algorithms

Exploring Four Simple and Effective Algorithms

- Using K-Nearest Neighbors and PCA

Performing Cross-Validation, Selection, and Optimization

- Loading the Boston Housing Dataset

Understanding the Power of the Many

- Optimizing the Depth of Decision Tree

Here's what you get

30	15	24
LIVE LABS	VIDEO TUTORIALS	MINUTES

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