

uCertify

Course Outline

**Hands-on Data Analysis and Visualization with
Pandas**



26 Apr 2025

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: Preface

Chapter 2: Introduction to Data Analysis

Chapter 3: JupyterLab

Chapter 4: Python Overview

Chapter 5: Introduction to Numpy

Chapter 6: Introduction to Pandas

Chapter 7: Data Analysis

Chapter 8: Time Series Analysis

Chapter 9: Introduction to Statistics

Chapter 10: Matplotlib

Chapter 11: Seaborn

Chapter 12: Exploratory Data Analysis

Videos and How To

8. Practice Test

Here's what you get

Features

9. Performance Based 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. 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.

35
QUIZ

3. 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.

4. 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.

5. 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.

6. 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

7. 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

Chapter 2: Introduction to Data Analysis

- Inspiration for data analysis
- Domain expertise
- Maths and statistics
- Artificial intelligence
- Machine learning
- Data Infrastructure
- Data Analysis Process
- Why Python for Data Analysis?
- Conclusion

Chapter 3: JupyterLab

- Introduction to JupyterLab
- Components
- Cell modes
- Menu
- Magic commands
- Keyboard shortcuts
- Conclusion

Chapter 4: Python Overview

- Python, Hello World
- Variables and data types
- Functions
- Lambda
- List comprehensions
- Functional programming using (map, filter, and reduce)
- Working with datetime objects
- Conclusion

Chapter 5: Introduction to Numpy

- Narray
- Difference between List and Numpy arrays
- Storage
- Type check
- Speed
- Copying arrays
- Mathematical operations
- Trigonometric functions
- Statistical operations
- Reshaping
- Vertical and horizontal stacking of Numpy arrays
- Fancy indexing
- Indexing with Boolean arrays
- Broadcasting
- Conclusion

Chapter 6: Introduction to Pandas

- Data structures in pandas

- Series
- DataFrames
- Conclusion

Chapter 7: Data Analysis

- Handling different file formats
- Handling rows and columns
- Groupby
- Filter
- Concatenate DataFrames
- Merge DataFrames
- Purging duplicate rows
- Data Transformations
- Crosstab
- Cleansing the Data
- Replacing individual values
- Pivot and pivot table
- Grouper

- Handling large datasets
- Modin Pandas
- Conclusion

Chapter 8: Time Series Analysis

- Creating time series data
- Converting string-based dates to datetime objects
- Unix / Epoch time
- Time Series Analysis Using a Real-Time Dataset
- Handling Timezones
- Shifting or Lagging
- Handling Holidays
- Conclusion

Chapter 9: Introduction to Statistics

- Population
- Sample
- Types of data

- Levels of Measurement
- Inferential Statistics
- Hypothesis Testing
- Conclusion

Chapter 10: Matplotlib

- Why data visualization?
- Matplotlib architecture
- Chart properties
- Controlling xticks, y_ticks, and tick_labels
- Scatter plot
- Bar plot
- Histograms
- Pie Chart
- Subplots
- Conclusion

Chapter 11: Seaborn

- Why Seaborn?

- Matplotlib versus Seaborn
- About pokemon
- Importing libraries and dataset
- Visualizing Statistical Relationships
- Plotting Categorical Variables
- Visualizing the Distribution of the Data
- Conclusion

Chapter 12: Exploratory Data Analysis

- A little story, Titanic
- Importing libraries and dataset
- Handling missing values
- Variable identification
- Categorical nominal
- Univariate analysis
- Bivariate analysis
- HeatMap
- Multivariate Analysis

- Handling Outliers
- Feature Selection
- Conclusion

8. 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.

9. 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

Here's what you get

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