uCertify

Course Outline

Pandas for Everyone: Python Data Analysis

04 Aug 2025

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3. Exercises, Quizzes, Flashcards & Glossary

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4. Expert Instructor-Led Training
5. ADA Compliant & JAWS Compatible Platform
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    Here's what you get

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11. Post-Assessment

1. Course Objective

Pandas is an open-source Python library for data analysis. The Pandas for Everyone: Python Data Analysis course focuses on loading data into Python with the help of the Pandas library. This course contains interactive lessons with knowledge checks, quizzes, and hands-on labs to get a deeper understanding of the concepts such as Pandas DataFrame and Data Structure Basics, Plotting Basics, Tidy Data, Data Assembly, Data Normalization, linear regression, survival models, and so on.

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

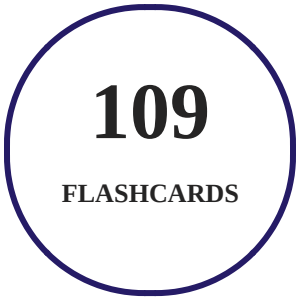
There is no limit to the number of times learners can attempt these. Exercises come with detailed remediation, which ensures that learners are confident on the topic before proceeding.

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

- Breakdown of the Course
- How to Read This Course
- Setup

Chapter 2: Pandas DataFrame Basics

- Introduction
- Load Your First Data Set
- Look at Columns, Rows, and Cells
- Grouped and Aggregated Calculations
- Basic Plot
- Conclusion

Chapter 3: Pandas Data Structures Basics

- Create Your Own Data
- The Series
- The DataFrame
- Making Changes to Series and DataFrames
- Exporting and Importing Data
- Conclusion

Chapter 4: Plotting Basics

- Why Visualize Data?

- Matplotlib Basics
- Statistical Graphics Using matplotlib
- Seaborn
- Pandas Plotting Method
- Conclusion

Chapter 5: Tidy Data

- Columns Contain Values, Not Variables
- Columns Contain Multiple Variables
- Variables in Both Rows and Columns
- Conclusion

Chapter 6: Apply Functions

- Primer on Functions
- Apply (Basics)
- Vectorized Functions
- Lambda Functions (Anonymous Functions)
- Conclusion

Chapter 7: Data Assembly

- Combine Data Sets
- Concatenation
- Observational Units Across Multiple Tables
- Merge Multiple Data Sets
- Conclusion

Chapter 8: Data Normalization

- Multiple Observational Units in a Table (Normalization)
- Conclusion

Chapter 9: Groupby Operations: Split-Apply-Combine

- Aggregate
- Transform
- Filter
- The pandas.core.groupby. DataFrameGroupBy object
- Working With a MultiIndex
- Conclusion

Chapter 10: Missing Data

- What Is a NaN Value?
- Where Do Missing Values Come From?
- Working With Missing Data
- Pandas Built-In NA Missing
- Conclusion

Chapter 11: Data Types

- Data Types
- Converting Types
- Categorical Data
- Conclusion

Chapter 12: Strings and Text Data

- Introduction
- Strings
- String Methods
- More String Methods

- String Formatting (F-Strings)
- Regular Expressions (RegEx)
- The regex Library
- Conclusion

Chapter 13: Dates and Times

- Python's datetime Object
- Converting to datetime
- Loading Data That Include Dates
- Extracting Date Components
- Date Calculations and Timedeltas
- Datetime Methods
- Getting Stock Data
- Subsetting Data Based on Dates
- Date Ranges
- Shifting Values
- Resampling
- Time Zones

- Arrow for Better Dates and Times
- Conclusion

Chapter 14: Linear Regression (Continuous Outcome Variable)

- Simple Linear Regression
- Multiple Regression
- Models with Categorical Variables
- One-Hot Encoding in scikit-learn with Transformer Pipelines
- Conclusion

Chapter 15: Generalized Linear Models

- About This Lesson
- Logistic Regression (Binary Outcome Variable)
- Poisson Regression (Count Outcome Variable)
- More Generalized Linear Models
- Conclusion

Chapter 16: Survival Analysis

- Survival Data

- Kaplan Meier Curves
- Cox Proportional Hazard Model
- Conclusion

Chapter 17: Model Diagnostics

- Residuals
- Comparing Multiple Models
- k-Fold Cross-Validation
- Conclusion

Chapter 18: Regularization

- Why Regularize?
- LASSO Regression
- Ridge Regression
- Elastic Net
- Cross-Validation
- Conclusion

Chapter 19: Clustering

- k-Means
- Hierarchical Clustering
- Conclusion

Chapter 20: Life Outside of Pandas

- The (Scientific) Computing Stack
- Performance
- Dask
- Siuba
- Ibis
- Polars
- PyJanitor
- Pandera
- Machine Learning
- Publishing
- Dashboards
- Conclusion

Chapter 21: It’s Dangerous To Go Alone!

- Local Meetups
- Conferences
- The Carpentries
- Podcasts
- Other Resources
- Conclusion

Chapter 22: Appendix A: Concept Maps

Chapter 23: Appendix B: Installation and Setup

- B.1 Install Python
- B.2 Install Python Packages
- B.3 Download Book Data

Chapter 24: Appendix C: Command Line

- C.1 Installation
- C.2 Basics

Chapter 25: Appendix D: Project Templates

Chapter 26: Appendix E: Using Python

- E.1 Command Line and Text Editor
- E.2 Python and IPython
- E.3 Jupyter
- E.4 Integrated Development Environments (IDEs)

Chapter 27: Appendix F: Working Directories

Chapter 28: Appendix G: Environments

- G.1 Conda Environments
- G.2 Pyenv + Pipenv

Chapter 29: Appendix H: Install Packages

- H.1 Updating Packages

Chapter 30: Appendix I: Importing Libraries

Chapter 31: Appendix J: Code Style

- J.1 Line Breaks in Code

Chapter 32: Appendix K: Containers: Lists, Tuples, and Dictionaries

- K.1 Lists

- K.2 Tuples
- K.3 Dictionaries

Chapter 33: Appendix L: Slice Values

Chapter 34: Appendix M: Loops

Chapter 35: Appendix N: Comprehensions

Chapter 36: Appendix O: Functions

- O.1 Default Parameters
- O.2 Arbitrary Parameters

Chapter 37: Appendix P: Ranges and Generators

Chapter 38: Appendix Q: Multiple Assignment

Chapter 39: Appendix R: Numpy ndarray

Chapter 40: Appendix S: Classes

Chapter 41: Appendix T: SettingWithCopyWarning

- T.1 Modifying a Subset of Data
- T.2 Replacing a Value

- T.3 More Resources

Chapter 42: Appendix U: Method Chaining

Chapter 43: Appendix V: Timing Code

Chapter 44: Appendix W: String Formatting

- W.1 C-Style
- W.2 String Formatting: .format() Method
- W.3 Formatting Numbers

Chapter 45: Appendix X: Conditionals (if-elif-else)

Chapter 46: Appendix Y: New York ACS Logistic Regression Example

Chapter 47: Appendix Z: Replicating Results in R

- Z.1 Linear Regression
- Z.2 Logistic Regression
- Z.3 Poisson Regression

12. Practice Test

Here's what you get

50	50
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

Pandas DataFrame Basics

- Performing Grouped and Aggregated Calculations Using the .groupby() Method

Pandas Data Structures Basics

- Creating a DataFrame and Making Changes to it

Plotting Basics

- Creating a Scatter Plot Using Multivariate Data
- Creating a Density Plot Using Bivariate Data

Tidy Data

- Using Functions and Methods to Process and Tidy Data

Apply Functions

- Performing Calculations Across DataFrames
- Vectorizing Functions

Data Assembly

- Performing Concatenation Using the concat() Function
- Merging Multiple Data Sets Using the .merge() Function

Data Normalization

- Understanding Multiple Observational Units in a Data Set

Groupby Operations: Split-Apply-Combine

- Performing Data Summarization Using Group-by Operations
- Performing Boolean Subsetting on the Data
- Performing Operations on Grouped Objects

Missing Data

- Finding and Cleaning Missing Data

Data Types

- Performing Data Type Conversion

Strings and Text Data

- Finding and Substituting a Pattern

Dates and Times

- Converting an Object Type into a datetime Type
- Extracting Date Components from the Data
- Getting Stock Data and Subsetting it Based on Dates
- Resampling Dates Using the .resample() Method

Linear Regression (Continuous Outcome Variable)

- Performing Linear Regression
- Performing Multiple Regression

Generalized Linear Models

- Performing Logistic Regression
- Performing Poisson Regression Using the poisson() Function

Survival Analysis

- Performing Survival Analysis Using the KaplanMeierFitter() Function

Model Diagnostics

- Comparing Models Using Cross-Validation

Regularization

- Performing L1 Regularization Using the Lasso() Function
- Performing L2 Regularization Using the Ridge() Function

Clustering

- Performing k-Means Clustering
- Using Hierarchical Clustering Algorithms

Here's what you get

30	20	43
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.

You can't stay away! Get in touch with our team to know how we can work