

# uCertify

## Course Outline

### Practical Data Science With Jupyter



30 Oct 2025

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

Syllabus

Chapter 1: Preface

Chapter 2: Data Science Fundamentals

Chapter 3: Installing Software and System Setup

Chapter 4: Lists and Dictionaries

Chapter 5: Package, Function, and Loop

Chapter 6: NumPy Foundation

Chapter 7: Pandas and DataFrame

Chapter 8: Interacting with Databases

Chapter 9: Thinking Statistically in Data Science

Chapter 10: How to Import Data in Python?

Chapter 11: Cleaning of Imported Data

Chapter 12: Data Visualization

Chapter 13: Data Pre-processing

Chapter 14: Supervised Machine Learning

Chapter 15: Unsupervised Machine Learning

Chapter 16: Handling Time-Series Data

Chapter 17: Time-Series Methods

Chapter 18: Case Study-1

Chapter 19: Case Study-2

Chapter 20: Case Study-3

Chapter 21: Case Study-4

Chapter 22: Python Virtual Environment

Chapter 23: Introduction to An Advanced Algorithm - CatBoost

Chapter 24: Revision of All Lessons' Learning

Videos and How To

## 1. 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.

## 2. 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.

## 3. 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.

## 4. 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

## 5. 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: Data Science Fundamentals

- What is data?
- What is data science?
- What does a data scientist do?
- Real-world use cases of data science
- Why Python for data science?
- Conclusion

## Chapter 3: Installing Software and System Setup

- System requirements
- Downloading Anaconda
- Installing the Anaconda on Windows
- Installing the Anaconda in Linux
- How to install a new Python library in Anaconda?
- Open your notebook - Jupyter
- Know your notebook
- Conclusion

## Chapter 4: Lists and Dictionaries

- What is a list?
- How to create a list?
- Different list manipulation operations
- Difference between Lists and Tuples
- What is a Dictionary?
- How to create a dictionary?
- Some operations with dictionary
- Conclusion

## Chapter 5: Package, Function, and Loop

- The help() function in Python
- How to import a Python package?
- How to create and call a function?
- Passing parameter in a function
- Default parameter in a function
- How to use unknown parameters in a function?
- A global and local variable in a function
- What is a Lambda function?

- Understanding main in Python
- while and for loop in Python
- Conclusion

## Chapter 6: NumPy Foundation

- Importing a NumPy package
- Why use NumPy array over list?
- NumPy array attributes
- Creating NumPy arrays
- Accessing an element of a NumPy array
- Slicing in NumPy array
- Array concatenation
- Conclusion

## Chapter 7: Pandas and DataFrame

- Importing Pandas
- Pandas data structures
- .loc[] and .iloc[]
- Some Useful DataFrame Functions

- Handling missing values in DataFrame
- Conclusion

## Chapter 8: Interacting with Databases

- What is SQLAlchemy?
- Installing SQLAlchemy package
- How to use SQLAlchemy?
- SQLAlchemy engine configuration
- Creating a table in a database
- Inserting data in a table
- Update a record
- How to join two tables
- Conclusion

## Chapter 9: Thinking Statistically in Data Science

- Statistics in data science
- Types of statistical data/variables
- Basics of probability
- Statistical distributions

- Pearson correlation coefficient
- Probability Density Function (PDF)
- Real-world example
- Statistical inference and hypothesis testing
- Conclusion

## Chapter 10: How to Import Data in Python?

- Importing text data
- Importing CSV data
- Importing Excel data
- Importing JSON data
- Importing pickled data
- Importing a compressed data
- Conclusion

## Chapter 11: Cleaning of Imported Data

- Know your data
- Analyzing missing values
- Dropping missing values

- Automatically fill missing values
- How to scale and normalize data?
- How to parse dates?
- How to apply character encoding?
- Cleaning inconsistent data
- Conclusion

## Chapter 12: Data Visualization

- Bar chart
- Line chart
- Histograms
- Scatter plot
- Stacked plot
- Box plot
- Conclusion

## Chapter 13: Data Pre-processing

- About the case-study
- Importing the dataset

- Exploratory data analysis
- Data cleaning and pre-processing
- Feature Engineering
- Conclusion

## Chapter 14: Supervised Machine Learning

- Some common ML terms
- Introduction to machine learning (ML)
- Unsupervised learning
- List of common ML algorithms
- Supervised ML fundamentals
- Solving a classification ML problem
- Solving a regression ML problem
- How to tune your ML model?
- How to handle categorical variables in sklearn?
- The advanced technique to handle missing data
- Conclusion

## Chapter 15: Unsupervised Machine Learning

- Why unsupervised learning?
- Unsupervised learning techniques
- Principal Component Analysis (PCA)
- Case study
- Validation of unsupervised ML
- Conclusion

## Chapter 16: Handling Time-Series Data

- Why time-series is important?
- How to handle date and time?
- Transforming a time-series data
- Manipulating a time-series data
- Comparing time-series growth rates
- How to change time-series frequency?
- Conclusion

## Chapter 17: Time-Series Methods

- What is time-series forecasting?
- Basic steps in forecasting

- Time-series forecasting techniques
- Autoregression (AR)
- Moving Average (MA)
- Forecast future traffic to a web page
- Conclusion

### Chapter 18: Case Study-1

- Predict whether or not an applicant will be able to repay a loan
- Conclusion

### Chapter 19: Case Study-2

- Build a prediction model that will accurately classify which text messages are spam
- Conclusion

### Chapter 20: Case Study-3

- Build a film recommendation engine
- Conclusion

### Chapter 21: Case Study-4

- Predict house sales in King County, Washington State, USA, using regression

- Conclusion

## Chapter 22: Python Virtual Environment

## Chapter 23: Introduction to An Advanced Algorithm - CatBoost

- What is a Gradient Boosting algorithm?
- Introduction to CatBoost
- Install CatBoost in Python virtual environment
- How to solve a classification problem with CatBoost?
- Push your notebook in your GitHub repository
- Conclusion

## Chapter 24: Revision of All Lessons' Learning

- Conclusion

You can't stay away! Get

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