uCertify

Course Outline

Principles of Data Science

04 Aug 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: Introduction

   Chapter 2: Data Science Terminology

   Chapter 3: Types of Data

   Chapter 4: The Five Steps of Data Science

   Chapter 5: Basic Mathematics

   Chapter 6: Impossible or Improbable – A Gentle Introduction to Probability

   Chapter 7: Advanced Probability

   Chapter 8: What Are the Chances? An Introduction to Statistics

   Chapter 9: Advanced Statistics

   Chapter 10: Communicating Data

   Chapter 11: How to Tell if Your Toaster is Learning – Machine Learning Essentials

   Chapter 12: Predictions Don't Grow on Trees, or Do They?

   Chapter 13: Introduction to Transfer Learning and Pre-Trained Models

   Chapter 14: Mitigating Algorithmic Bias and Tackling Model and Data Drift

   Chapter 15: AI Governance

   Chapter 16: Navigating Real-World Data Science Case Studies in Action

   Videos and How To

7. Live labs

   Lab Tasks

   Here's what you get

1. ⊕ 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.

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EXERCISES

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.

141

QUIZ

3. ⚡ 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.

101

FLASHCARDS
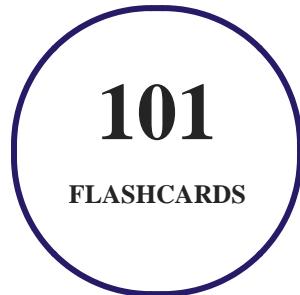
4. 📖 Glossary of terms

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.

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GLOSSARY OF TERMS
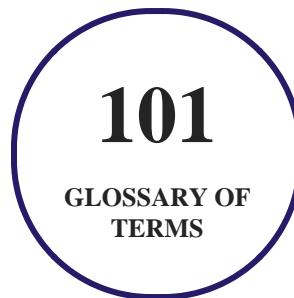
5. Expert Instructor-Led Training

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.

6. 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.

7. 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.

8. 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

9. ⚙ 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

- Who is this course for?

- What this course covers

- To get the most out of this course

- Conventions used

Chapter 2: Data Science Terminology

- What is data science?

- The data science Venn diagram

- Some more terminology

- Data science case studies

- Summary

Chapter 3: Types of Data

- Structured versus unstructured data

- The four levels of data

- Summary

Chapter 4: The Five Steps of Data Science

- Introduction to data science

- Exploring the data

- Summary

Chapter 5: Basic Mathematics

- Basic symbols and terminology

- Linear algebra

- Summary

Chapter 6: Impossible or Improbable – A Gentle Introduction to Probability

- Basic definitions

- Bayesian versus frequentist

- How to utilize the rules of probability

- Introduction to binary classifiers

- Summary

Chapter 7: Advanced Probability

- Bayesian ideas revisited

- Random variables

- Summary

Chapter 8: What Are the Chances? An Introduction to Statistics

- What are statistics?

- How do we obtain and sample data?

- How do we measure statistics?

- The empirical rule

- Summary

Chapter 9: Advanced Statistics

- Understanding point estimates

- Sampling distributions

- Confidence intervals

- Hypothesis tests

- Summary

Chapter 10: Communicating Data

- Why does communication matter?

- Identifying effective visualizations

- When graphs and statistics lie

- Verbal communication

- Summary

Chapter 11: How to Tell if Your Toaster is Learning – Machine Learning Essentials

- Introducing ML

- Types of ML

- Predicting continuous variables with linear regression

- Summary

Chapter 12: Predictions Don't Grow on Trees, or Do They?

- Performing naïve Bayes classification

- Understanding decision trees

- Diving deep into UL

- Feature extraction and PCA

- Summary

Chapter 13: Introduction to Transfer Learning and Pre-Trained Models

- Understanding pre-trained models

- Different types of TL

- TL with BERT and GPT

- Summary

Chapter 14: Mitigating Algorithmic Bias and Tackling Model and Data Drift

- Understanding algorithmic bias

- Sources of algorithmic bias

- Measuring bias

- Consequences of unaddressed bias and the importance of fairness

- Mitigating algorithmic bias

- Bias in LLMs

- Emerging techniques in bias and fairness in ML

- Understanding model drift and decay

- Mitigating drift

- Summary

Chapter 15: AI Governance

- Mastering data governance

- Navigating the intricacy and the anatomy of ML governance

- A guide to architectural governance

- Summary

Chapter 16: Navigating Real-World Data Science Case Studies in Action

- Introduction to the COMPAS dataset case study

- Text embeddings using pretrainedmodels and OpenAI

- Summary

Videos and How To

uCertify course includes videos to help understand concepts. It also includes How Tos that help learners in accomplishing certain tasks.

2 **VIDEOS**	**01** **MINUTES**

10. 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

Data Science Terminology

- Extracting and Analyzing Cashtags in Tweets

Types of Data

- Exploring CSV Data
- Analyzing Temperature Data Using Statistical Methods

The Five Steps of Data Science

- Performing Time-Based Analysis
- Mastering Data Insights

Basic Mathematics

- Working with Vectors and Matrices
- Computing Similarities with Set Operations
- Performing Matrix Operations and Analyzing Execution Time

Impossible or Improbable – A Gentle Introduction to Probability

- Simulating Random Rolls and Calculating Probabilities
- Generating and Analyzing Random Data

Advanced Probability

- Using Probability to Examine Survival Factors in a Dataset
- Simulating Dice Rolls and Analyzing Statistical Averages
- Creating and Visualizing the Normal Distribution

What Are the Chances? An Introduction to Statistics

- Analyzing A/B Testing Results
- Evaluating the Central Tendency and Variability of Data
- Applying Z-Scores to Data Analysis

Advanced Statistics

- Estimating Break Lengths and Demographic Proportions
- Converting Bimodal Data to a Normal Distribution Using Sampling
- Calculating and Interpreting Confidence Intervals
- Testing Hypotheses: Type I and II Errors

Communicating Data

- Comparing Distribution Metrics with Histograms and Box Plots
- Visualizing Data with Scatter and Bar Charts
- Quantifying Data Relationships Through Correlation Analysis

How to Tell if Your Toaster is Learning – Machine Learning Essentials

- Predicting Alcohol Consumption Using Regression Models
- Preparing Data for Regression and Visualization

Predictions Don't Grow on Trees, or Do They?

- Processing and Analyzing SMS Data
- Transforming Data and Creating Decision Tree Models
- Clustering Data Using K-Means

- Optimizing Models Using Feature Selection and PCA

Introduction to Transfer Learning and Pre-Trained Models

- Fine-Tuning a Pre-Trained Model for Sentiment Analysis

Mitigating Algorithmic Bias and Tackling Model and Data Drift

- Generating and Visualizing Word Data

AI Governance

- Interpreting Sentiment Analysis Predictions with LIME

Navigating Real-World Data Science Case Studies in Action

- Visualizing Distributions and Encoding Categorical Variables

Here's what you get

33	33	01:06
LIVE LABS	VIDEO TUTORIALS	HOURS

You can't stay away! Get

in touch with our team to