

uCertify

Course Outline

Principles of Data Science



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
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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
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.

69
EXERCISES

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.

6
QUIZ

4. 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.

5. 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.

6. 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.

7. 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

8. 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
- Questions and answers

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 pretrained models and OpenAI
- Summary

9. 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.

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

- Computing Similarities with Set Operations
- Working with Vectors and Matrices
- 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
- Creating and Visualizing the Normal Distribution
- Simulating Dice Rolls and Analyzing Statistical Averages

What Are the Chances? An Introduction to Statistics

- Evaluating the Central Tendency and Variability of Data
- Analyzing A/B Testing Results
- 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

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LIVE LABS

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VIDEO TUTORIALS

01:06
HOURS

You can't stay away! Get

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