

# uCertify

## Course Outline

### Python Machine Learning By Example



16 May 2026

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: Getting Started with Machine Learning and Python

Chapter 3: Building a Movie Recommendation Engine with Naïve Bayes

Chapter 4: Predicting Online Ad Click-Through with Tree-Based Algorithms

Chapter 5: Predicting Online Ad Click-Through with Logistic Regression

Chapter 6: Predicting Stock Prices with Regression Algorithms

Chapter 7: Predicting Stock Prices with Artificial Neural Networks

Chapter 8: Mining the 20 Newsgroups Dataset with Text Analysis Techniques

Chapter 9: Discovering Underlying Topics in the Newsgroups Dataset with Clustering and Topic Modeling

Chapter 10: Recognizing Faces with Support Vector Machine

Chapter 11: Machine Learning Best Practices

Chapter 12: Categorizing Images of Clothing with Convolutional Neural Networks

Chapter 13: Making Predictions with Sequences Using Recurrent Neural Networks

Chapter 14: Advancing Language Understanding and Generation with the Transformer Models

Chapter 15: Building an Image Search Engine Using CLIP: a Multimodal Approach

Chapter 16: Making Decisions in Complex Environments with Reinforcement Learning

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.

**67**  
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.

**172**  
QUIZ

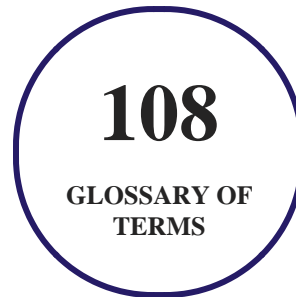
## 3. flashcards

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.

**108**  
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.



## 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 this course is for
- What this course covers

## Chapter 2: Getting Started with Machine Learning and Python

- An introduction to machine learning
- Knowing the prerequisites
- Getting started with three types of machine learning
- Digging into the core of machine learning
- Data preprocessing and feature engineering
- Combining models
- Installing software and setting up
- Summary
- Exercises

## Chapter 3: Building a Movie Recommendation Engine with Naïve Bayes

- Getting started with classification

- Exploring Naïve Bayes
- Implementing Naïve Bayes
- Building a movie recommender with Naïve Bayes
- Evaluating classification performance
- Tuning models with cross-validation
- Summary
- Exercises

## Chapter 4: Predicting Online Ad Click-Through with Tree-Based Algorithms

- A brief overview of ad click-through prediction
- Getting started with two types of data – numerical and categorical
- Exploring a decision tree from the root to the leaves
- Implementing a decision tree from scratch
- Implementing a decision tree with scikit-learn
- Predicting ad click-through with a decision tree
- Ensembling decision trees – random forests
- Ensembling decision trees – gradient-boosted trees
- Summary

- Exercises

## Chapter 5: Predicting Online Ad Click-Through with Logistic Regression

- Converting categorical features to numerical – one-hot encoding and ordinal encoding
- Classifying data with logistic regression
- Training a logistic regression model
- Training on large datasets with online learning
- Handling multiclass classification
- Implementing logistic regression using TensorFlow
- Summary
- Exercises

## Chapter 6: Predicting Stock Prices with Regression Algorithms

- What is regression?
- Mining stock price data
- Getting started with feature engineering
- Estimating with linear regression
- Estimating with decision tree regression

- Implementing a regression forest
- Evaluating regression performance
- Predicting stock prices with the three regression algorithms
- Summary
- Exercises

## Chapter 7: Predicting Stock Prices with Artificial Neural Networks

- Demystifying neural networks
- Building neural networks
- Picking the right activation functions
- Preventing overfitting in neural networks
- Predicting stock prices with neural networks
- Summary
- Exercises

## Chapter 8: Mining the 20 Newsgroups Dataset with Text Analysis Techniques

- How computers understand language – NLP
- Touring popular NLP libraries and picking up NLP basics
- Getting the newsgroups data

- Exploring the newsgroups data
- Thinking about features for text data
- Visualizing the newsgroups data with t-SNE
- Summary
- Exercises

## Chapter 9: Discovering Underlying Topics in the Newsgroups Dataset with Clustering and Topic Modeling

- Learning without guidance – unsupervised learning
- Getting started with k-means clustering
- Clustering the newsgroups dataset
- Discovering underlying topics in newsgroups
- Summary
- Exercises

## Chapter 10: Recognizing Faces with Support Vector Machine

- Finding the separating boundary with SVM
- Classifying face images with SVM
- Estimating with support vector regression

- Summary
- Exercises

## Chapter 11: Machine Learning Best Practices

- Machine learning solution workflow
- Best practices in the data preparation stage
- Best practices in the training set generation stage
- Best practices in the model training, evaluation, and selection stage
- Best practices in the deployment and monitoring stage
- Summary
- Exercises

## Chapter 12: Categorizing Images of Clothing with Convolutional Neural Networks

- Getting started with CNN building blocks
- Architecting a CNN for classification
- Exploring the clothing image dataset
- Classifying clothing images with CNNs
- Boosting the CNN classifier with data augmentation

- Improving the clothing image classifier with data augmentation
- Advancing the CNN classifier with transfer learning
- Summary
- Exercises

## Chapter 13: Making Predictions with Sequences Using Recurrent Neural Networks

- Introducing sequential learning
- Learning the RNN architecture by example
- Training an RNN model
- Overcoming long-term dependencies with LSTM
- Analyzing movie review sentiment with RNNs
- Revisiting stock price forecasting with LSTM
- Writing your own War and Peace with RNNs
- Summary
- Exercises

## Chapter 14: Advancing Language Understanding and Generation with the Transformer Models

- Understanding self-attention

- Exploring the Transformer's architecture
- Improving sentiment analysis with BERT and Transformers
- Generating text using GPT
- Summary
- Exercises

## Chapter 15: Building an Image Search Engine Using CLIP: a Multimodal Approach

- Introducing the CLIP model
- Getting started with the dataset
- Finding images with words
- Summary
- Exercises
- References

## Chapter 16: Making Decisions in Complex Environments with Reinforcement Learning

- Setting up the working environment
- Introducing OpenAI Gym and Gymnasium
- Introducing reinforcement learning with examples
- Solving the FrozenLake environment with dynamic programming

- Performing Monte Carlo learning
- Solving the Blackjack problem with the Q-learning algorithm
- Summary
- Exercises

## 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

#### **Building a Movie Recommendation Engine with Naïve Bayes**

- Implementing Naïve Bayes
- Building a Movie Recommender with Naïve Bayes

#### **Predicting Online Ad Click-Through with Tree-Based Algorithms**

- Implementing a Decision Tree with scikit-learn

- Predicting Ad Click-Through with a Decision Tree

### **Predicting Online Ad Click-Through with Logistic Regression**

- Training a Logistic Regression Model Using Gradient Descent
- Predicting Ad Click-Through with Logistic Regression Using Gradient Descent
- Training a Logistic Regression Model Using SGD
- Performing Feature Selection Using L1 Regularization and Random Forest
- Implementing Logistic Regression Using TensorFlow

### **Predicting Stock Prices with Regression Algorithms**

- Acquiring Data and Generating Features
- Implementing Linear Regression with scikit-learn
- Implementing Linear Regression with TensorFlow
- Implementing Decision Tree Regression
- Implementing a Regression Forest

### **Predicting Stock Prices with Artificial Neural Networks**

- Building a Neural Network
- Predicting stock prices with the three regression algorithms
- Predicting Stock Prices with Neural Networks

### **Mining the 20 Newsgroups Dataset with Text Analysis Techniques**

- Getting and Exploring the Newsgroup Data
- Visualizing the Newsgroups Data with t-SNE

### **Discovering Underlying Topics in the Newsgroups Dataset with Clustering and Topic Modeling**

- Implementing k-means from Scratch
- Implementing k-means with scikit-learn
- Clustering Newsgroups Data Using k-means
- Discovering Underlying Topics in Newsgroups

### **Recognizing Faces with Support Vector Machine**

- Implementing SVR
- Implementing SVM
- Classifying Face Images with SVM

### Machine Learning Best Practices

- Handling Missing Data in Datasets
- Extracting and Representing Features from Text Data
- Selecting and Evaluating Features for Model Training
- Saving, Loading, and Reusing Trained Models

### Categorizing Images of Clothing with Convolutional Neural Networks

- Exploring the clothing image dataset
- Reducing Dimensionality for Improving Model Performance
- Fitting the CNN model
- Boosting the CNN classifier with data augmentation
- Improving the clothing image classifier with data augmentation

### Making Predictions with Sequences Using Recurrent Neural Networks

- Analyzing and preprocessing the data

## Here's what you get



You can't stay away! Get

know how we can work