



Professional, Workforce, Career and Executive Education

Course Name

Machine Learning & Artificial Intelligence

Contact Hours: 40

Course Description

Immerse yourself in the fields of Machine Learning and Artificial Intelligence! With over 40 hours of expert instruction, by the time you've completed this self-directed bundle of courses, you'll have a firm grasp of core machine learning concepts and be on your way to applying this essential technology in your career.

Courses included in this bundle:

1. Deep Learning & Computer Vision: An Introduction
2. Recommendation Systems in Python
3. Machine Learning: Decision Trees & Random Forests
4. Twitter Sentiment Analysis in Python
5. Python Programming: From Beginner to Intermediate
6. Quant Trading Using Machine Learning
7. Factor Analysis
8. Linear & Logistic Regression

Please note: Course of study may be completed earlier than indicated and students retain access for one year from the date of enrollment for reference purposes.

Outcome

Upon successful completion of this course, you will have learned the following concepts & so much more!

- Discover Core Machine Learning Concepts & Build an Artificial Neural Network.
- Build a movie recommendation system in Python.
- Learn Intuitive Machine Learning Techniques by Exploring a Classic Problem.
- Use Python and the Twitter API to build your own sentiment analyzer.
- Go from beginner to intermediate level Python user.
- Apply Machine Learning techniques to Quant Trading.
- Use Principal Components Analysis to Extract Factors.
- Build Regression Models with Principal Components in Excel, R, Python.
- Understand the risks involved in regression and avoid common pitfalls.
- Use simple & multiple regressions to explain variance & predict an outcome.

- Project Files & Supplemental Material included with each course.

Assessment

This course contains chapter quizzes and a corresponding answer key, which can be used for self-assessment purposes.

There is no additional fee for this material, and once it is downloaded, the student can access it from their computer anytime.

Required Book(s)

This course includes a downloadable folder of additional material containing work-along project files, Reference Guide PDF, and Assessments. No additional purchase required.

Outline

Deep Learning & Computer Vision: An Introduction

Design and Implement a simple computer vision use-case: digit recognition
Confidently move on to more complex and comprehensive material on these topics
Grasp the theory underlying deep learning and computer vision
Understand use-cases for computer vision as well as deep learning

Recommendation Systems in Python

Learn about Movielens – a famous dataset with movie ratings
Use Pandas to read and play around with the data
Learn how to use Scipy and Numpy
Introduction to Latent Factor Methods
Introduction to Memory-based Approaches
Design & implement a Recommendation System in Python

Machine Learning: Decision Trees & Random Forests

Decision Fatigue & Decision Trees
A Few Useful Things to Know about Overfitting
Random Forests

Twitter Sentiment Analysis in Python

Design and Implement a sentiment analysis measurement system in Python
Grasp the theory underlying sentiment analysis, and its relation to binary classification
Identify use-cases for sentiment analysis
Learn about Sentiment Lexicons, Regular Expressions & Twitter API

Python Programming: From Beginner to Intermediate

Pick up programming even if you have NO programming experience at all
Write Python programs of moderate complexity
Perform complicated text processing – splitting articles into sentences and words and doing things with them
Work with files, including creating Excel spreadsheets and working with zip files
Apply simple machine learning and natural language processing concepts such as classification, clustering and summarization
Understand Object-Oriented Programming in a Python context

Quant Trading Using Machine Learning

Develop Quant Trading models using advanced Machine Learning techniques
Compare and evaluate strategies using Sharpe Ratios
Use techniques like Random Forests and K-Nearest Neighbors to develop Quant Trading models
Use Gradient Boosted trees and tune them for high performance
Use techniques like Feature engineering, parameter tuning and avoiding overfitting
Build an end-to-end application from data collection and preparation to model selection

Factor Analysis

Understand & Analyze Principal Components
Use Principal Components for dimensionality reduction and exploratory factor analysis
Apply PCA to explain the returns of a technology stock like Apple®
Build Regression Models with Principal Components in Excel, R, & Python

Linear & Logistic Regression

Method of least squares, Explaining variance, Forecasting an outcome
Residuals, assumptions about residuals
Implement simple regression in Excel, R and Python
Interpret regression results and avoid common pitfalls
Implement Multiple regression in Excel, R and Python
Introduce a categorical variable
Applications of Logistic Regression, the link to Linear Regression and Machine Learning
Solving logistic regression using Maximum Likelihood Estimation and Linear Regression
Extending Binomial Logistic Regression to Multinomial Logistic Regression
Implement Logistic regression to build a model stock price movements in Excel, R and Python

COST: US\$795.00 (Volume pricing Available)

CERTIFICATION: Clemson university/Chattanooga State College