







E-Learning COURSE OUTLINE

Data Science with Python

-  High quality Content
-  Study Guides
-  Learning Videos
-  Practice Tests
-  Learning Support
-  Learn on any device





Syllabus

Lesson 00 - Course Overview

- Course Overview

Lesson 01 - Data Science Overview

- Introduction to Data Science
- Different Sectors Using Data Science
- Purpose and Components of Python
- Quiz
- Key Takeaways

Lesson 02 - Data Analytics Overview

- Data Analytics Process
- Knowledge Check
- Exploratory Data Analysis (EDA)
- Quiz
- EDA-Quantitative Technique
- EDA - Graphical Technique
- Data Analytics Conclusion or Predictions
- Data Analytics Communication
- Data Types for Plotting
- Data Types and Plotting
- Quiz
- Key Takeaways
- Knowledge Check

Lesson 03 - Statistical Analysis and Business Applications

- Introduction to Statistics
- Statistical and Non-statistical Analysis
- Major Categories of Statistics
- Statistical Analysis Considerations
- Population and Sample
- Statistical Analysis Process
- Data Distribution
- Dispersion
- Knowledge Check
- Histogram
- Knowledge Check
- Testing
- Knowledge Check
- Correlation and Inferential Statistics
- Quiz
- Key Takeaways

Lesson 04 - Python Environment Setup and Essentials

- Anaconda
- Installation of Anaconda Python Distribution (contd.)
- Data Types with Python
- Basic Operators and Functions
- Quiz
- Key Takeaways



Syllabus

Lesson 05 - Mathematical Computing with Python (NumPy)

- Introduction to NumPy
- Activity-Sequence it Right
- Demo 01-Creating and Printing an ndarray
- Knowledge Check
- Class and Attributes of ndarray
- Basic Operations
- Activity-Slice It
- Copy and Views
- Mathematical Functions of NumPy
- Assignment 01: Evaluate the datasets containing GDPs of different countries
- Demo: Assignment 01
- Assignment 02: Evaluate the datasets of Summer Olympics, 2012
- Demo: Assignment 02
- Quiz
- Key Takeaways

Lesson 06 - Scientific computing with Python (SciPy)

- Introduction to SciPy
- SciPy Sub Package - Integration and Optimization
- Knowledge Check
- SciPy sub package
- Demo - Calculate Eigenvalues and Eigenvector
- Knowledge Check
- SciPy Sub Package - Statistics, Weave and

IO

- Assignment 01: Use SciPy to solve a linear algebra problem
- Demo: Assignment 01
- Assignment 02: Use SciPy to define 20 random variables for random values
- Demo: Assignment 02
- Quiz
- Key Takeaways

Lesson 07 - Data Manipulation with Pandas

- Introduction to Pandas
- Knowledge Check
- Understanding DataFrame
- View and Select Data Demo
- Missing Values
- Data Operations
- Knowledge Check
- File Read and Write Support
- Knowledge Check-Sequence it Right
- Pandas Sql Operation
- Assignment 01: Analyze the Federal Aviation Authority(FAA) dataset using Pandas
- Demo: Assignment 01
- Assignment 02: Analyze the dataset in csv format given for fire department
- Demo: Assignment 02
- Quiz
- Key Takeaways



Syllabus

Lesson 08 - Machine Learning with Scikit-Learn

- Machine Learning Approach
- Understand data sets and extract its features
- Identifying problem type and learning model
- How it Works
- Train, test and optimizing the model
- Supervised Learning Model Considerations
- Knowledge Check
- Scikit-Learn
- Knowledge Check
- Supervised Learning Models - Linear Regression
- Supervised Learning Models - Logistic Regression
- Unsupervised Learning Models
- Pipeline
- Model Persistence and Evaluation
- Knowledge Check
- Assignment 01: Evaluate a dataset to find the features or media channels used by a firm and sales figures for each channel
- Demo: Assignment 01
- Assignment 02: Analyze a dataset to find the features and response label of it
- Demo: Assignment 02
- Quiz
- Key Takeaways

Lesson 09 - Natural Language Processing with Scikit Learn

- NLP Overview
- NLP Applications
- Knowledge Check
- NLP Libraries-Scikit
- Extraction Considerations
- Scikit Learn-Model Training and Grid Search
- Assignment 01: Analyze a given spam collection dataset
- Demo Assignment 01
- Assignment 02: Analyze the sentiment dataset using NLP
- Demo: Assignment 02
- Quiz
- Key Takeaway

Lesson 10 - Data Visualization in Python using matplotlib

- Introduction to Data Visualization
- Knowledge Check
- Line Properties
- (x,y) Plot and Subplots
- Knowledge Check
- Types of Plots
- Assignment 01: Analyze the “auto mpg data” and draw a pairplot using seaborn library for mpg, weight, and origin
- Demo : Assignment 01
- Assignment 02: Draw a pie chart to visualize a dataset
- Demo: Assignment 02
- Quiz
- Key Takeaways



Syllabus

Lesson 11 - Web Scraping with BeautifulSoup

- Web Scraping and Parsing
- Knowledge Check
- Understanding and Searching the Tree
- Navigating options
- Demo3 Navigating a Tree
- Knowledge Check
- Modifying the Tree
- Parsing and Printing the Document
- Assignment 01: Scrape the website page to perform some tasks
- Demo: Assignment 01
- Assignment 02: Scrape the website page to perform some tasks
- Demo: Assignment 02
- Quiz
- Key takeaways

Lesson 12 - Python integration with Hadoop MapReduce and Spark

- Why Big Data Solutions are Provided for Python0
- Hadoop Core Components
- Python Integration with HDFS using Hadoop Streaming
- Demo 01 - Using Hadoop Streaming for Calculating Word Count
- Knowledge Check
- Python Integration with Spark using PySpark

- Demo 02 - Using PySpark to Determine Word Count
- Knowledge Check
- Assignment 01: Determine the word count for Amazon dataset
- Demo: Assignment 01
- Assignment 02: Count and display all airports present in New York using PySpark
- Demo : Assignment 02
- Quiz
- Key takeaways



Syllabus

Course End Projects:

The course includes four real-world, industry-based projects. Successful evaluation of one of the following projects is a part of the certification eligibility criteria:

Project 1: Products rating prediction for Amazon

Amazon, one of the leading US-based e-commerce companies, recommends products within the same category to customers based on their activity and reviews of similar products. Amazon would like to improve this recommendation engine by predicting ratings for the non-rated products and add them to recommendations accordingly.

Domain: E-commerce

Project 2: Demand Forecasting for Walmart

Predict accurate sales for 45 stores of Walmart, one of the US-based leading retail stores, considering the impact of promotional markdown events. Check if macroeconomic factors, such as CPI and unemployment rate, have an impact on sales.

Domain: Retail

Project 3: Improving Customer Experience for Comcast

Comcast, one of the largest US-based global telecommunication companies wants to improve customer experience by identifying and acting on problem areas that lower customer satisfaction. The company is also looking for key recommendations that can be implemented to deliver the best customer experience.

Domain: Telecom

Project 4: Attrition Analysis for IBM

IBM, one of the leading US-based IT companies, would like to identify the factors that influence attrition of employees. Based on the parameters identified, the company would also like to build a logistics regression model that can help predict if an employee will churn or not.

Domain: Workforce Analytics



Syllabus

Project 5: NYC 311 Service Request Analysis

Perform a service request data analysis of New York City 311 calls. You will focus on data wrangling techniques to understand patterns in the data and visualize the major complaint types.

Domain: Telecommunication

Project 6: MovieLens Dataset Analysis

The GroupLens Research Project is a research group in the Department of Computer Science and Engineering at the University of Minnesota. The researchers of this group are involved in several research projects in the fields of information filtering, collaborative filtering, and recommender systems. Here, we ask you to perform an analysis using the exploratory data analysis (EDA) technique for user datasets.

Domain: Engineering

Project 7: Stock Market Data Analysis

As a part of this project, you will import data using Yahoo DataReader from the following companies: Yahoo, Apple, Amazon, Microsoft, and Google. You will perform fundamental analytics, including plotting, closing price, plotting stock trade by volume, performing daily return analysis, and using pair plot to show the correlation between all of the stocks.

Domain: Stock Market

Project 8: Titanic Dataset Analysis

On April 15, 1912, the Titanic sank after colliding with an iceberg, killing 1502 out of 2224 passengers and crew. This tragedy shocked the world and led to better safety regulations for ships. Here, we ask you to perform an analysis using the EDA technique, in particular applying machine learning tools to predict which passengers survived the tragedy.

Domain: Hazard

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People Development

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- Scrum Product Owner Certified (SPOC)
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- Agile Scrum Master (ASM)

PROJECT MANAGEMENT

- Project Management Professional
- PMI Risk Management Professional
- PRINCE2 Foundation & Practitioner
- MSP Foundation & Practitioner
- CBAP

QUALITY MANAGEMENT

- Six Sigma Green Belt (SSGB)
- Six Sigma Black Belt (SSBB)
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