DataTrained Data Science Program with Machine Learning and Deep Learning

Duration : 10 Months

Programming Language Used : Python

Course Curriculum

Data science is the new emerging field in today's world with high growth and rich career perspective. Data science is a multifaceted field used to gain insights from complex data. It's right time to move your career in data science by starting from basics of Data analytics and management to advanced topics like in Machine Learning, Deep Learning, and Natural Language Processing with industrial case studies. This course provides in-depth understanding of how data science integrates into various industrial verticals such as healthcare, banking, telecom, e-commerce, transportation and more. The course is a mix of instructor-led training and guided self-paced tutorial.

Course Content

Introduction to Data Science

Duration Module 1
2hrs

Introduction to Data Science

Data Science Era

Data Science involvement in Industries

Business Intelligence vs. Data Science

Data Science Life Cycle

Tools of Data Science

Introduction to Python

Introduction to Machine Learning

Module 2
2hrs
Introduction to Python Programming

Introduction to Python

Basic Operations in Python

Variable Assignment

Functions: in-built functions, user defined functions

Condition: if, if-else, nested if-else, else-if

Pre Reads (Attachment for students)

Assignment (For student)

Assignment Solution

Module 3
6hrs
Data Structure - Introduction

List: Different Data Types in a List, List in a List

Operations on a list: Slicing, Splicing, Sub-setting

Condition (true/false) on a List

Applying functions on a List

Dictionary: Index, Value

Operation on a Dictionary: Slicing, Splicing, Sub-setting

Condition (true/false) on a Dictionary

Applying functions on a Dictionary

Modules and Packages

Regex operations

Pre Reads (Attachment for students)

Assignment (For student)

Assignment Solution

Module 4
4hrs

Introduction to SQL (Structured Query Language)

Basic SQL statement

Advanced SQL (Searching, sorting, grouping)

Accessing databases using python

Module 5
2hrs

Numpy Array:

Data Types in an Array, Dimensions of an Array

Operations on Array: Indexing, Slicing, Splicing, Sub-setting

Conditional (T/F) on an Array

Loops: For, While

Shorthand for For

Conditions in shorthand for

Control statements

Shape Manipulation

Linear Algebra

Module 6
3hrs

Python Pandas - Home

Python Pandas - Introduction

Python Pandas - Environment Setup

Introduction to Data Structures

Python Pandas - Series

Python Pandas - DataFrame

Python Pandas - Panel

Python Pandas - Basic Functionality

Function Application

Python Pandas - Reindexing

Python Pandas - Iteration

Python Pandas - Sorting

Working with Text Data

Options & Customization

Indexing & Selecting Data

Python Pandas - Aggregations
2hrs

Python Pandas - Missing Data

Python Pandas - GroupBy

Python Pandas - Merging/Joining

Python Pandas - Concatenation

Python Pandas - Date Functionality

Python Pandas - Categorical Data

Python Pandas - Visualization

Pre Reads (Attachment for students)

Assignment (For student)

Assignment Solution

Module 7
2hrs

Intro to Statistics

Statistical Inference

Terminologies of Statistics

Descriptive statistics

Statistical functions

Measures of Centers

Mean

Median

Mode

Measures of Spread

Variance

Standard Deviation

Histogram

Probability

Normal Distribution

Binary Distribution

Poisson distribution

Skewness

Bell curve

Hypothesis Building and Testing

Chi-Square Test

Correlation Matrix

Module 8
2hrs

Scientific computing with Python

SciPy and its Characteristics

SciPy sub-packages

SciPy sub-packages – Integration

SciPy sub-packages – Optimize

Linear Algebra

SciPy sub-packages - Statistics

Module 9
2hrs

Data Analysis Pipeline

What is Data Extraction

Types of Data

Raw and Processed Data

Data Wrangling

Exploratory Data Analysis

Visualization of Data

- MatplotLib
- Bar Plot
- Histogram Plot
- Box Plot
- Area Plot
- Scatter Plot

Pie Plot

Seaborn

Pre Reads (Attachment for students)

Assignment (For student)

Assignment Solution

Module 10
2hrs

Introduction to Machine Learning

Machine Learning Use-Cases

Machine Learning Process Flow

Machine Learning Categories

Module 11
2hrs

Data Preprocessing

Data preparation

Intro to Scikit Learn

Module 12
6hrs

Regression

Types

Algorithms

Linear Regression

RMSE

R2 score

Logistic Regression

Importance of Dimensions
2hrs

Introduction to Dimensionality

Why Dimensionality Reduction

PCA

Factor Analysis

Scaling dimensional model

Encoding

Implementation with Case Studies

Intro to Kaggle and UCI repository

Pre Reads (Attachment for students)

Assignment (For student)

Assignment Solution

Module 13
6hrs

Classification
K-nearest neighbours

Metrics

Confusion Matrix

Classification report

Support Vector Machines

Kernel

Working of SVM

Naive Bayes

Hyperparameter Optimization

Decision Tree Classifier

Random Forest Classifier

Ensemble Techniques and SVM tuning

Underfitting & Overfitting

Entropy

AUC-ROC Curve

Implementation with Case Studies

Cross –validation

Pre Reads (Attachment for students)

Assignment (For student)

Assignment Solution

Module 14
2hrs

Unsupervised learning

Clustering Algorithms

K-Means Clustering

Hierarchical Clustering

Implementation with Case Studies

Pre Reads (Attachment for students)

Assignment (For student)

Assignment Solution

Module 15
2hrs

Recommendation Engine

Collaborative filtering

The course will cover 12 + industrial real time case studies.

Module 16
8hrs

Specialization course: Students can opt any one elective(s)

Elective (1)

Introduction to NLP (Natural Language Processing)

NLTK

Tf-idf Vectorizer

Building ChatterBot

BeautifulSoup

Sentiment analysis

Deep Learning in NLP Implementation with Case Studies

Pre Reads (Attachment for students)

Assignment (For student)

Assignment Solution

Elective (2)

Introduction to Artificial Intelligence Deep Learning in Computer Vision

Tensorflow library

Keras library

CNN (Convolutional Neural Network)

RNN (Recurrent Neural Network)

Implementation with Case Studies

Pre Reads (Attachment for students)

Assignment (For student)

Assignment Solution

Extra Boot camps (Optional based on time)

1. Orientation and resume session
2. Tableau

Extra New research and model based on time

Course Highlights:

Use Case Based study
Hands on Live Projects
Study material
Self –Paced module
Interview questions
Mock Interview
Mentoring
Career services