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Python with Data Science & Machine Learning Duration : 6 Months

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COURSE OUTCOME

Student will begin with entire process for data science projects and the different roles and skills that are needed, Obtaining data through a variety of sources, including web APIs and page scraping. Using tools like Python, Pandas, Numpy, Seaborns, matplotlib, and numerous algorithm to explore and manipulate data by being exposed to various projects.

LIVE PROJECT.

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BREAK UP

PART -1 PYTHON
PART -2 DATA ANLYTICS & DATA VISULIZATION
PART -3 MACHINE LEARNING

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MACHINE LEARNING COURSE IN BRIEF

Brief History
Why Python
Where to use

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PART -1
PYTHON

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Module 1

BEGINNING PYTHON BASICS

1. The print statement
2. Comments
3. Basic data types introduction
4. String Operations in Python
5. Simple Input & Output
6. Simple Output Formatting

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Module 2

DATA TYPES AND STRUCTURES IN PYTHON

1. Numbers
2. Strings
3. List
4. List Method
5. Dictionary
6. Tuple
7. Sets
8. Frozen sets
9. Mutability and immutability
10. Type Casting

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Module 3

PYTHON PROGRAM FLOW

1. Indentation
2. The If statement and its' related statement
3. An example with if and it's a related statement
4. The while loop
5. The for loop
6. The range statement
7. Break & Continue statements
8. Enumerate, zip & tuple unpacking
9. Examples for looping

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Module 4

FUNCTIONS & MODULES

1. Create your own functions
2. Functions Parameters
3. Variable Arguments
4. Scope of a Function
5. Function Documentation/Docstrings
6. Lambda Functions
7. Map and Filter
8. Exercise with functions

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Module 5

EXCEPTION HANDLING

1. Errors
2. Exception Handling with try
3. Handling Multiple Exceptions
4. Writing your own Exceptions

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Module 6

FILE HANDLING

1. File Handling Modes
2. Reading Files
3. Writing & Appending to Files
4. Handling File Exceptions
5. The with statement

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Module 7

CLASSES IN PYTHON

1. Classes introduction
2. Variable Type
3. Creating Classes
4. Defining objects
5. Instance Methods
6. Inheritance
7. Polymorphism

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Module 8

REGULAR EXPRESSIONS

1. Simple Character Matches
2. Metacharacters
3. Special Sequences
4. Regex sets
5. Matching at Beginning or End
6. Match Objects
7. Substituting
8. Splitting a String

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Module 9

PYTHON & DATABASE CONNECTION

1. Introduction to MongoDB
2. Installation
3. DB Connection with Python
4. Creating DB collections
5. Insert, Read, Update, Delete operations

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PART -2

DATA ANLYTICS & DATA VISULIZATION

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Module 10

DATA SCIENCE & MACHINE LEARNING SECTION

1. Overview of Data science
2. What is Data Science
3. Different Sectors Using Data Science

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Module 11

MATHEMATICAL COMPUTING WITH PYTHON (NUMPY)

1. Introduction to Numpy
2. Creating and Printing an array
3. Indexing and slicing of an array
4. Numpy Operations
5. Numpy Methods
6. Numpy Exercise
7. Numpy Exercise Solutions

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Module 12

DATA MANIPULATION WITH PANDAS

1. Introduction of Pandas
2. Understanding Series
3. Series Operations
4. Understanding DataFrame
5. View and Select Data Demo
6. Missing Values
7. Groupby
8. Operations
9. File Read and Write Support

Projects 1 Using Pandas (Getting insights from salary dataset)
Projects 2 As assignment (on Ecommerce Purchase Dataset)

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Module 13

PYTHON FOR DATA VISUALIZATION-MATPLOTLIB, SEABORN & PLOTLY

1. Introduction to Matplotlib
2. Matplotlib Part 1
3. Matplotlib Part 2
4. Seaborn introduction
5. Distribution & categorical plots using seaborn
6. Heatmap using Seaborn
7. Plotly introduction
8. Geographical plotting

DATA CAPSTONE PROJECT

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PART -3

MACHINE LEARNING

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Module 14

BOOSTING ALGORITHMS USING PYTHON

1. Concept of weak learners
2. Introduction to boosting algorithms
3. Adaptive Boosting
4. Extreme Gradient Boosting (XGBoost)

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Module 15

SUPPORT VECTOR MACHINES (SVM)

1. Introduction to SVM
2. Working with High Dimensional Data
3. Working of SVM and its uses
4. Breast Cancer Prediction Project using SVM

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Module 16

PRINCIPAL COMPONENT ANALYSIS

1. Need for dimensionality reduction
2. Principal Component Analysis (PCA)
3. PCA with Python on cancer Dataset

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Module 17

NAÏVE BAYES ALGORITHM

1. Conditional Probability
2. Overview of Naïve Bayes Algorithm
3. News Classification Project using naïve Bayes classifier

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Module 18

OPENCV

1. Basic of Computer Vision & OpenCV
2. Images Manipulations
3. Image Segmentation
4. Object Detection
5. Face, People and Car Detection
6. Machine Learning in Computer Vision
7. Motion Detection Project using Opencv

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Module 19

DEEP LEARNING

1. Introduction to neural networks
2. Perceptron model
3. Activation functions in NN
4. Introduction to Tensorflow
5. MNIST project Overview
6. MNIST project Solution
7. Fashion MNIST Project

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Module 20

NATURAL LANGUAGE PROCESSING

1. NLP introduction
2. NLP with Python Part 1 (bag of words)
3. NLP with Python Part 2 (TF-IDF)
4. Spam-Ham message detection NLP Project

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Module 21

INTRODUCTION TO MACHINE LEARNING

1. Introduction to Machine Learning
2. Understanding supervised and unsupervised learning with examples
3. Test-train split
4. Underfitting and overfitting

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Module 22

LINEAR REGRESSION

1. Linear Regression Theory
2. Dependent and independent Variables
3. Linear Regression with Python
4. Linear Regression Project on Predicting House Price

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Module 23

LOGISTIC REGRESSION

1. Logistic Regression Theory – Introduction
2. Logistic Regression with Python – Part 1 – EDA
3. Logistic Regression with Python – Part 2 – ML Model
4. Logistic Regression with Python – Part 3 – Conclusion
5. Logistic Regression Project on Titanic Dataset Overview and Project Solutions

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Module 24

K NEAREST NEIGHBOURS

1. KNN Theory
2. KNN with Python
3. KNN Project Overview and Project Solutions

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Module 25

K MEANS CLUSTERING

1. K Means Algorithm Theory
2. K Means with Python
3. K Means Project Overview
4. K Means Project Solutions

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Module 26

TREE MODELS USING PYTHON

1. Introduction to decision trees
2. Entropy and Information gain
3. Introduction to bagging algorithm
4. Random Forests
5. Project on tree models
6. Project solution

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ASSIGNMENT LIST (ANY ONE)

1. KNN Project Overview and Project Solutions
2. MNIST project Overview
3. MNIST project Solution
4. Fashion MNIST Project
5. Spam-Ham message detection NLP Project
6. Motion Detection Project using Opencv
7. DATA CAPSTONE PROJECT

Microsoft Technology Associate

Sample

has successfully completed the requirements to be recognized as a Microsoft Technology Associate for

Introduction to Programming using Python

Date of achievement: February 12, 2020

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Satya Nadella
Chief Executive Officer

Microsoft
Technology Associate