



# Professional Certificate in Data Analytics

## Programme Curriculum

3 Terms 3 Projects 1 Elective

# Professional Certificate in Data Analytics



## Preface

**Term 1**  
**Foundation of  
Statistics** \_\_\_\_\_

**Term 2**  
**Introduction to  
Python** \_\_\_\_\_

**Term 3**  
**Data Visualization &  
EDA** \_\_\_\_\_

**Capstone Project**

**Structured Query Language (SQL)**

# Professional Certificate in Data Analytics



## Programme Curriculum

**3** Terms  
**3** Projects  
**1** Elective

### Term 1

## Foundation of Statistics

 **Term Duration: 1 Week**

 **Software Skill: N/A**

 **Assignments: 2**

### Module 1

## Statistics

#### Topic 1

### What is Data Science?

What is Data Science?

Lifecycle of data science

Skills required for data science

Applications of data science in different industries

#### Topic 2

### What is Data Science?

Statistics in Data science

What is Statistics?

How is Statistics used in Data Science?

Population and Sample

Parameters and Statistics

### Module 2

## Statistics for Data Science

#### Topic 3

### What is Data Science?

Data types

Variable and its types

Sampling Techniques:

Convenience Sampling

Simple Random Sampling

Stratified Sampling

Systematic Sampling

Cluster Sampling

Term 1

# Foundation of Statistics



Module 2

## **Statistics for Data Science**

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Topic 4

### **Descriptive Statistics**

**What is Univariate and Bi Variate Analysis?**

**Measures of Central Tendencies**

**Measures of Dispersion**

**-Normal Distribution**

**-Standard Normal Distribution**

**Skewness and Kurtosis**

**Box Plots and Outliers detection**

**Covariance and Correlation**

### **Case Study**

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Term 2

# Introduction to Python



Term 2

# Introduction to Python



Term Duration : 2 Weeks



Software Skill : Python



Assgnments: 4

Module 1

## Core Python

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Topic 1

### Python Introduction

What is Python?

Why Data Science requires Python?

Installation of Anaconda

Understanding Jupyter Notebook

Basic commands in Jupyter Notebook

Understanding Python Syntax

Topic 2

### Data Types & Data Structures

Variables

Strings

Lists

Sets

Tuples

Dictionaries

Topic 3

### Control Flow & Conditional Statements

Conditional Operators, Arithmetic Operators &

Logical Operators

If, Else if and Else Statements

While Loops

For Loops

Nested Loops

List and Dictionary Comprehensions

Term 2

# Introduction to Python



Topic 4

## Functions

Code Optimization

Scope

Lambda Functions

Map, Filter and Reduce

Modules and Packages

Module 2

## Advanced Python

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Topic 5

## File Handling

Create, Read, Write files

Operations in File Handling

Errors and Exception Handling

Topic 6

## Miscellaneous Python

Date and Time

OOPS Concepts

Topic 7

## Regular Expressions

Structured Data and Unstructured Data

Literals and Meta Characters

How to Regular Expressions using Pandas?

Inbuilt Methods

Pattern Matching

## Case Study

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Term 3

# Data Visualization & EDA



Term 3

# Data Visualization & EDA

 Term Duration : 2 Weeks

 Software Skill: Python

 Assignments: 4

Module 1

## Number Analytics

Topic 1

### **Numpy**

Arrays

Basic Operations in Numpy

Indexing

Array Processing

## Case Study

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Module 2

## Working with Data Frames

Topic 1

### **Pandas**

Series

DataFrames

Indexing and slicing

Groupby

Concatenating

Merging Joining

Missing Values

Operations

Data Input and Output

Pivot

Cross tab

## Case Study

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**Industry Project**  
**Elective**

## Capstone Project

## Structured Query Language (SQL)