2. Python



| **Module** | **Time** (**Mins**) |
| --- | --- |
| **Module 1: Introduction to Python** |  |
| **Module 2: Sequences and File Operations** |  |
| **Module 3: Functions and Object-oriented Programming** |  |
| **Module 4: Working with Modules and Handling Exceptions** |  |
| **Module 5: Array Manipulation using NumPy** |  |
| **Module 6: Data Manipulation using Pandas** |  |
| **Module 7: Data Visualization using Matplotlib and Seaborn** |  |
| **Module 8: GUI Programming** |  |
| **Module 9: Developing Web Maps and Representing Information using Plots** |  |
| **Module 10: Web Scraping and Computer Vision using OpenCV** |  |
| **Module 11: Database Integration with Python** |  |

# Module 1: Introduction to Python

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## Need for programming

## Advantages of programming

## Overview of python

## Organisations using python

## Python Applications in various domains

## Variables

## Operands and expressions

## Conditional statements

## Loops

## Structural pattern matching

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# Module 2: Sequences and File Operations

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## Accepting user input and eval function

## Files input/output functions

## Lists

## Tuple

## Strings manipulation

## Sets and set operations

## Python dictionary

# Module 3: Functions and Object-oriented Programming

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## User-defined functions

## Function parameters

## Different types of arguments

## Global variables

## Global keyword

## Lambda functions

## Built-in functions

## Object-oriented concepts

## Public, protected and private attributes

## Class variable and instance variable

## Constructor and destructor

## Inheritance and its types

## Method resolution order

1. **Decorators**
2. **Overloading and overriding**
3. **Getter and setter methods**

**Module 4: Working with Modules and Handling Exceptions**

## Standard libraries

## Packages and import statements

## Reload function

## Creating a module

## Important modules in python

## Sys module

## OS module

## Math module

## Date-time module

## Random module

## JSON module

## Regular expression

## Exception handling

# Module 5: Array Manipulation using NumPy

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## Basics of data analysis

## NumPy - Arrays

## Array operations

## Indexing, slicing, and Iterating

## NumPy array attributes

## Matrix product

## NumPy functions

## Array manipulation

## File handling using NumPy

# Module 6: Data Manipulation using Pandas

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## Basics of data analysis

## NumPy - Arrays

## Array operations

## Indexing, slicing, and Iterating

## NumPy array attributes

## Matrix product

## NumPy functions

## Array manipulation

## File handling using NumPy

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# Module 7: Exploratory Data Analysis (EDA)

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## Python

# Module 8: Data Visualization using Matplotlib and Seaborn

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## Why data visualisation?

## Matplotlib library

## Seaborn

## Line plots

## Multiline plots

## Bar plot

## Histogram

## Pie chart

## Scatter plot

## Boxplot

## Saving charts

## Customising visualisations

## Saving plots

## Grids

## Subplots

## Heatmaps

## Use of Folium library

## Use of Pandas library

## Flow Chart of web map application

## Developing web map using Folium and Pandas

## Reading Information from titanic dataset and represent It using plots

# Module 9: Web Scraping and Computer Vision using OpenCV

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## Beautiful Soup library

## Scrapy

## Requests library

## Scrap All hyperlinks from a webpage using BeautifulSoup and Requests

## Plotting charts using Bokeh

**Plotting scatter plots using Bokeh**

# Module 10: Computer Vision using OpenCV

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## **Image editing using OpenCV**

## **Face detection using OpenCV**

## **Motion detection and capturing video**

# Module 11: Database Integration with Python

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## **Basics of database management**

## **Python MySql**

## **Create database**

## **Create a table**

## **Insert into table**

## **Select query**

## **Where clause**

## **OrderBy clause**

## **Delete query**

## **Drop table**

## **Update query**

## **Limit clause**

## **Join and Self-Join**

## **MongoDB (Unstructured)**

## **Insert\_one query**

## **Insert\_many query**

## **Update\_one query**

## **Update\_many query**

## **Create\_index query**

## **Drop\_index query**

## **Delete and drop collections**

## **Limit query**