**GREENBRIDGE SCHOOL OF OPEN TECHNOLOGIES**

**Certificate in Python Programming**

**Duration : 5 weeks**

Python is an object-oriented programming language created by Guido Rossum in 1989. It is ideally designed for rapid prototyping of complex applications. Today many large companies use Python programming language, including NASA, Google, YouTube etc. This one-month course will help you learn all the basics of python programming.

This five-week python course is designed for absolute beginners for learning python programming. At the end of this course students will learn Python installation, Variables, Data structure, control flow and loops, Strings, Functions, File handling, introduction to data science and simple animations.

**Week 1**

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| **Topic** | **Summary** |
| Introduction | * Introduction to python programming * Language, Common terms used, First python Program, Program Explanation. |
| Python **print()** function | * How to print in python with Examples |
| Python variables | * How to Define/Declare String Variable Type |
| Python Data Structure | **Python TUPLE**   * Pack, Unpack, Compare, Slicing, Delete, Key. |
| **Python Dictionary (Dict)**   * Update, Cmp, Len, Sort, Copy, Items, Str * How to Add Key/Value Pair |
| **Python operators**   * Arithmetic, Logical, Comparison, Assignment, Bitwise & Precedence |
| **Python Arrays (List)**   * Create, Reverse, Pop with Python Array Examples |
| **Python 2D Arrays**   * Two-Dimentional List Examples |
| **LAB EXERCISE** |  |

**Week 2**

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| **Topic** | **Summary** |
| Python conditional Statements | * **If** statements * **IF … ELSE** statement * **SWITCH** Case |
| Python loops | * **For** loop * **While** loop * **Enumerator, Break, Continue** statement * **Break, Continue, pass** statement – learn with Example. |
| Python OOPs | * **Class, Object, Inheritance** and **Constructor** with Example. * **Polymorphism** in python with Example * **Mutable** and **Immutable** **Objects** in python with Examples. |
| Python Strings | * **Replace, Join, Split, Reverse, Uppercase & Lowercase.** * String **strip()** Function * String **count()** Function * String **format()** function * String **len()** Function * String **find()** function * String **split()** function |
| **LAB EXERCISE** |  |

**Week 3**

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| Python Functions | * Python **main** Function & method Examples * Function – **call, indentation, Arguments** & **return** Values. * Python **Lambda** Functions with Examples * Python **abs()** function – absolute value Example. * Python **round()** function * Python **range()** function – Float, List, For loop Examples. * Python **map()** Function * Python **Timeit()** with Example. * **Yield** in Python – **Generator & yield vs Return** Example * Python **Queue** – **FIFO, LIFO** Example * Python **Counter** in **Collections.** What is, Use & Example. * **Enumerate()** function in python – loop, Tuple, String (Example) * Python **time.sleep()** – Add delay to your code (Example) * **Type()** and **instance()** in Python – What is, Syntax & Examples. * Python **New Line** – How to Print WITHOUT Newline in Python * Python **Timer** Function- Measure Elapsed Time with Examples |
| **LAB EXERCISE** |  |

**Week 4**

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| **Topic** | **Summary** |
| Python File Handling | * Introduction to file handling in Python. * How to **Create, Open, Append Read, Write** to a file. * Python **Check** if **File** or **Dictionary Exists** * Python **Copy File** Method – Python COPY File using **shutil.copy(), shutil.copystat()** * Python **Rename File** and **Directories** using **os.rename()** method. * Python **ZIP file** with Example * Python **Exception Handling – Try, Catch, Finally.** * Python **readline()** Method |
| LAB EXERCISE |  |

**Week 5**

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| Topic | Summary |
| Introduction to python data science | * **Scipy** Library in python. What is | Library & Functions Examples * Reading and Writing **CSV** Files in python. Using **Modules** and **Pandas**. * Python JSON. Encode(dumps), Decode(loads) & Read JSON File * Plotting simple graphs in python (i.e. line graph, bar graph, etc). Using **Patplotlib.** |
| Animations Using Python | * **Matplotlib** library * **Plotly** library |
| LAB EXERCISE |  |