**Course Title:** Introduction to Python

**Instructor:** Muhammad Uzair Aslam

**Contact Information:** [m.uzair@statdevs.com](mailto:m.uzair@statdevs.com)

**Office Hours:** 11 Am – 1 Pm (Saturday & Sunday)

**Class Location:** Upcode Labs (Onsite)

**Class Time:** Saturday & Sunday (3 – 5 Pm)

**Course Description:**

This two-month course is designed to empower students by imparting a robust foundation in Python programming. By the end of this course, students will have the skills needed to write Python code, create functions, and be well-prepared for advanced fields such as Artificial Intelligence (AI) and Data Science. Python's versatility and extensive libraries make it a key language in these domains, and this course equips students with the proficiency to excel in these cutting-edge areas of technology and science.

**Course Materials:**

Reference Books:

1. Think Python, 2nd Edition (Allen B. Downey)

2. A Smarter Way to Learn Python (Mark Myers)

*Lecture Slides will be uploaded on Google Drive.*

**Weekly Plan:**

Week 1:

Class 1:

* Why Python - usage in AI/ML, easy to learn, popularity
* Set up Python, VS Code, extensions First program, arithmetic operations, values and types

Class 2:

* Variables - types, naming, arithmetic operations
* Expressions vs statements, order of precedence, comments

Week 2:

Class 3:

* Floor division, modulus operator
* Boolean expressions, logical operators
* Conditionals - if, else, elif
* Alternate execution

Class 4:

* Chained conditionals, nested conditionals
* Introduction to functions

Week 3:

Class 5:

* Function calls, math functions, composition
* Adding new functions, flow of execution
* Parameters and arguments

Class 6:

* Local variables and parameters
* Stack diagrams, fruitful vs void functions
* Return values

Week 4:

Class 7:

* Iterations and loops
* For loop While loop, break

Class 8:

* Nested Loops

Week 5:

Class 9:

* Strings - sequence, traversal, slicing, searching

Class 10:

* String methods, in operator, string comparison.

Week 6:

Class 11:

* Lists - operations, methods, traversal

Class 12:

* List indexing, slicing
* Map, filter, reduce
* Modifying lists

Week 7:

Class 13:

* Dictionaries - operations, traversal

Class 14:

* Dictionaries and lists, reverse lookup
* Tuples
* Session on creating projects

Week 8:

Class 15:

* File I/O - reading, writing, paths
* Loading data, plotting with Matplotlib

Class 16:

* Exception handling
* Introduction to pickling

Week 9:

Class 17:

* Numpy introduction and basics
* Numpy use cases

Class 18:

* Project presentations and final exam

**Attendance:** 3 Absences are allowed in the full course.

**Participation:** Students are expected to raise questions, participate in class discussion and complete all Class Labs.

**Instructions for Passing the Course:**

A minimum 60% is required to pass this course.

**Grading:**

| **Assignments** | **Description** | **Weight age (%)** |
| --- | --- | --- |
| Class Participation | It includes attendance of classes and participate in class discussions. | 10 |
| Class Labs | All classes will have hands on Lab Exercises where students are expected to complete and submit the labs. | 30 |
| Home Assignments | Students are required to submit all three problem sets within the deadlines. | 30 |
| Final Project | A maximum of 2 students will form a group to create the Final Project.  The project idea should be shared and finalized with the instructor by the end of Week 5. | 30 |

**Home Assessment Breakdown:**

Home Assignments (30%):

Assignment 1: 10% (Due at end of Week 3)

Assignment 2: 10% (Due at end of Week 6)

Assignment 3: 10% (Due at end of Week 9)

**Contact Information:**

The office hours for the instructor is 11 Am – 1 Pm (Saturday & Sunday)

For personal contact, you can email the instructor at [m.uzair@statdevs.com](mailto:m.uzair@statdevs.com).