Management Development Institute (MDI)
Diploma in Programming – (DP) Level 1
Course Name: Computer Programming I (Python)

Course Syllabus

Description/Introduction

Python is a general purpose programming language with a simple syntax, and a powerful set of libraries. It is an interpreted language, with a rich programming environment, including a robust debugger and profiler. While it is easy for beginners to learn, it is widely used in many scientific areas for data exploration. This course is an introduction to the Python programming language for students without prior programming experience. We cover data types, control flow, object-oriented programming, modules, packages, built-in functions, python decorators and generators..

After completing this course

At the end of the course students should be able to:

- Build a complete understanding of Python from the ground up!
- Learn to use Object Oriented Programming with classes!
- Learn advanced Python features, like the collections module and how to work with timestamps!
- Get a strong foundation of the python language to enable you to start learning any of the multiple programming options: from data science, statistics and machine learning to software and application development.
- Get familiar with code organization, a skill needed in Software Development.

Prerequisites

Certificate in Information technology and general computer skills will be fine. Mastering the keyboard will be huge advantage.

Expectations

Students are expected to attend all lectures, complete all the assignments, projects, and implement all the course lab exercises.

Grading

Your final grade will be based on your performance on the course's projects, assignments and assessment tests.

Projects	==	60%	(Milestone 15% each, Final 30%)
Assignment	==	30%	(Five Assignments each at 6%)
Assessment	==	10%	(Two Test each at 5%)

Lectures

Lectures will take place in MDI, computer lab. A schedule of lectures appears below:

PART ONE

1. Introduction and Setting up the Development Environment

1.1.1 Anaconda Package installation
1.1.2 IPython Console
1.1.3 Spyder IDE
1.1.4 Introduction to Git and GitHub

PART TWO

2. Python Object and Data Structure Basics

2.1.1 Numbers
2.1.2 Strings
2.1.3 Print Formatting
2.1.4 Quiz

2.2.1 Lists
2.2.2 Tuples
2.2.3 Dictionaries
2.2.4 Sets
2.2.5 Booleans
2.2.6 Files
2.2.6 Quiz

2.3 Objects and Data Structures Assessment Test

PART THREE
3. Python Comparison Operators and Statements

3.1.1 Comparison Operators
3.1.2 Chained Comparison Operators
3.1.3 Quiz

3.2.1 If, Elif and Else Statements
3.2.2 For Loop
3.2.3 While Loop
3.2.4 Range()
3.2.5 List Comprehensions
3.2.6 Quiz

3.3 Statements Assessment Test

PART FOUR
4. Methods and Functions

4.1.1 Methods
4.1.2 Functions
4.1.3 Lamda Expressions
4.1.4 Nested Statements and Scope
4.1.5 Quiz

4.2 Milestone Project 1 (Group Work)

PART FIVE
5. Object Oriented Programming

5.1.1 Objects
5.1.2 Classes
5.1.3 Methods
5.1.4 Inheritance
5.1.5 Quiz
5.1.5 OOP Homework Assignment

5.2.1 Errors and Exceptions
5.2.2 Handling Exceptions: try, except, finally
5.2.3 Quiz
5.2.4 Exceptions Homework Assignment

5.3 Milestone Project 2 (Individual Work)

PART SIX

6. Modules, Packages, and Built-in Functions

6.1.1 Modules, Packages, Imports
6.1.2 Creating your own Modules
6.1.3 Modules and Packages Assignment

6.2.1 Built-in Functions
6.2.1.1 Map and Reduce
6.2.1..3 Filter, Zip, Enumerate, all(), any()
6.2.1.4 Creating Complex Numbers
6.2.2 Built-in Functions Assignment

6.3.1 Python Decorators
6.3.2 Python Generators
6.3.3 Iteration VS Generation
6.3.4 Creating your own Generator
6.3.5 Python Decorators and Generators Assignment

7. Final Capstone Python Project

Website and Help

http://www.introtopython.org/

Labs

Labs offer opportunities to review recent lectures' materials with the lecturer or a TA and collaborate with class mates as well. This will be an interactive session using the ipython console and the spyder IDE.

Projects

All projects will be based on solving real-world problems.

Books

Think Python V2
Kenneth A. Lambert, The Fundamentals of Python: First Programs

Recommended reading

http://sirbiji.com/blog – I will be posting a series of tutorials on every topic we would cover.