GUJARAT TECHNOLOGICAL UNIVERSITY

<u>Master in Computer Application (Integrated MCA)</u>

Year III – (Semester-V) (W.E.F. June 2015)

Subject Name: Programming in Python

Subject Code: 4450601

1. **Learning Objectives :**
- To develop proficiency in creating based applications using the Python Programming Language.
- To be able to understand the various data structures available in Python programming language and apply them in solving computational problems.
- To be able to do testing and debugging of code written in Python.
- To be able to draw various kinds of plots using PyLab.
- To be able to use generators for generating series like fibonacci,

2. **Prerequisites**:
   Knowledge of some programming language like C, Java

3. **Contents :**

Unit No.	Course Content	No Of Lectures
1	**Introduction to Python:**The basic elements of Python, Branching programs, Strings and Input, Iteration	3
2	**Functions, Scoping and Abstraction:** Functions and Scoping, Specifications, Recursion, Global variables, Modules, Files	4
3	**Testing and Debugging:** Testing, Debugging	3
4	**Structured Types, Mutability and Higher-order Functions:** Tuples, Lists and Mutability, Functions as Objects, Strings, Tuples and Lists, Dictionaries	4
5	**Exceptions and assertions:** Handling exceptions, Exceptions as a control flow mechanism, Assertions	3
6	**Classes and Object-oriented Programming:** Abstract Data Types and Classes, Inheritance, Encapsulation and information hiding,	4
7	**Some Simple Algorithms and Data Structures:** Search Algorithms, Sorting Algorithms, Hashtables	5
8	**Plotting and more about Classes:** Plotting using PyLab, Plotting mortgages and extended examples	5
9	**Dynamic Programming:** Fibonacci sequence revisited, Dynamic programming and the 0/1 Knapsack algorithm, Dynamic programming and divide and conquer	5

4. Text Book:

1) John V Guttag. "Introduction to Computation and Programming Using Python", Prentice Hall of India

5. Reference Books:

1) Allen Downey, Jeffrey Elkner and Chris Meyers "How to think like a Computer Scientist, Learning with Python", Green Tea Press

2) Swaroop C H. "A Byte of Python", http://www.swaroopch.com/notes/python

3) "Python Programming", http://en.wikibooks.org/wiki/Python_Programming

4) "The Python Tutorial", http://docs.python.org/release/3.0.1/tutorial/

5) "Learn Python the Hard way", http://learnpythonthehardway.org/

6. Chapter wise Coverage from Text Book:

Unit No	Chapters
1	2
2	4
3	5
4	6
5	7
6	8
7	10
8	11
9	18

7. Accomplishments of the student after completing the course :

- Ability to create roboust applications using the Python programming language
- Ability to test and debug applications written using the Python programming language
- Ability to create applications for solving computational problems using the Python Programming Language.

8. Suggestions for Lab Sessions :

Labs may be done using version 3.0 of the Python Programming Language.

The main text book has sufficient problems for lab exercises.