Savitribai Phule Pune University
T.Y.B.Sc. (Computer Science) - Sem – V
Course Type: SECC – I Course Code : CS-3510
Course Title: Python Programming

Teaching Scheme	No. of Credits	Examination Scheme:
03 Lect / week	2	IE : 15 marks UE: 35 marks

Course Objectives

1. To introduce programming concepts using python
2. Student should be able to develop Programming logic using python
3. To develop basic concepts and terminology of python programming
4. To test and execute python programs

Course Outcomes

On completion of the course, student will be able to–

- Develop logic for problem solving
- Determine the methods to create and develop **Python programs** by utilizing the data
- structures like lists, dictionaries, tuples and sets.
- To be familiar about the basic constructs of programming such as data, operations, conditions, loops, functions etc.
- To write python programs and develop a small application project

Course Contents

Chapter 1	**An Introduction to Python**	**3 Lect**

Introduction to Python

The Python Programming Language, History, features, Applications, Installing Python, Running Simple Python program

Basics of Python

Standard data types - basic, none, Boolean (true & False), numbers, Variables, Constants,Python identifiers and reserved words, Lines and indentation, multi-line statements and Comments,Input/output with print and input ,functions Declaration, Operations on Data such as assignment, arithmetic, relational, logical and bitwise operations, dry run, Simple Input and output etc.

Chapter 2	**Control Statements**	**4 Lect**

Sequence Control – Precedence of operators, Type conversion

Conditional Statements: if, if-else, nested if-else,

Looping- for, while, nested loops, loop control statements (break, continue, pass)

a. **Strings**: declaration, manipulation, special operations, escape character, string formatting operator, Raw String, Unicode strings, Built-in String methods.

Chapter 3	**Lists, functions, tuples and dictionaries, Sets**	**7 Lect**

Python Lists: Concept, creating and accessing elements, updating & deleting lists, traversing a List, reverse Built-in List Operators, Concatenation, Repetition, In Operator, Built-in List functions and methods.

Functions: Definitions and Uses, Function Calls, Type Conversion Functions, Math Functions, Composition, Adding New Functions, Flow of Execution, Parameters and Arguments, Variables and Parameters, Stack Diagrams, Void Functions, Anonymous functions Importing with from, Return Values, Boolean Functions, More Recursion, Functional programming tools - filter(), map(), and reduce(),recursion, lambda forms.

Tuples and Dictionaries: Tuples, Accessing values in Tuples, Tuple Assignment, Tuples as return values, Variable-length argument tuples, and Basic tuples operations, Concatenation, Repetition, in Operator, Iteration, Built-in tuple functions, indexing, slicing and matrices. Creating a Dictionary, Accessing Values in a dictionary, Updating Dictionary, Deleting Elements from Dictionary, Properties of Dictionary keys, Operations in Dictionary, Built-In Dictionary Functions, Built-in Dictionary Methods.

Sets- Definition, transaction of set(Adding, Union, intersection), working with sets

Chapter 4	**Modules ,Working with files, Exception handling**	**4 Lect**

Modules: Importing module, Creating & exploring modules, Math module, Random module, Time module

Packages: Importing package, creating package,examples

Working with files: Creating files and Operations on files (open, close, read, write), File object attributes, file positions, Listing Files in a Directory, Testing File Types, Removing files and directories, copying and renaming files, splitting pathnames, creating and moving directories

Regular Expression- Concept of regular expression, various types of regular expressions, using match function.

Exception Handling: Built-in Exceptions, Handling Exceptions, Exception with Arguments, User-defined Exceptions.

Demonstration	**Programming Assignments:**	**18 Lect**

Out of 36 lectures, 18 are assigned for demonstration. Teacher should give demonstration of various programs mentioned below in the classroom or in the laboratory as per their convenience.

Programming assignments should be done individually by the student in their respective login from the list given in Labbook. The codes should be uploaded on either the local server, Moodle, Github or any LMS.

Assignment 1 - Python Basics
Assignment 2 – Arrays, Strings, and Functions
Assignment 3 - List, Tuples, Sets, and Dictionary
Assignment 4 - File Handling and Date-Time
Assignment 5 - Exception handling and Regular expression

Reference Books:

1. An Introduction to Computer Science using Python 3 by Jason Montojo, Jennifer Campbell, Paul Gries, The pragmatic bookshelf-2013
2. James Payne, "Beginning Python: Using Python and Python 3.1,Wrox Publication
3. Introduction to Computer Science Using Python- Charles Dierbach, Wiley Publication Learning with Python ", Green Tea Press, 2002
4. Introduction to Problem Solving with Python by E balguruswamy,TMH publication-2016
5. Beginning Programming with Python for Dummies Paperback – 2015 by John Paul Mueller
6. Object-oriented Programming in Python, Michael H. Goldwasser, David Letscher, Pearson Prentice Hall-2008

Savitribai Phule Pune University
T.Y.B.Sc. (Computer Science) - Sem – VI
Course Type: SECC - III Course Code: CS - 3610
Course Title: Software Testing Tools

Teaching Scheme:	No. of Credits:	Examination Scheme:
03 Lect / week	2	IE:15 marks UE: 35 marks

Prerequisites

- Basic knowledge of algorithms, problem solving, expected inputs/outputs
- Knowledge of C and Java Programming Language, compilation, debugging

Course Objectives:

- To provide the knowledge of software testing methods and strategies.
- To understand how testing methods can be used as an effective tool in quality assurance of software.
- To provide skills to design test case plan for testing software.
- 4.To provide knowledge of latest testing tools

Course Outcomes:

- To understand various software testing methods and strategies.
- To understand a variety of software metrics and identify defects and managing those defects for improvement in quality for given software.
- To design test cases and test plans, review reports of testing for qualitative software.
- 4. To understand latest testing tools used in the software industries.

Course Contents

Chapter 1	**Introduction to Test case design**	**4 lectures**
How to identify errors, bugs in the given application. Design entry and exit criteria for test case, design test cases in excel. Describe feature of a testing method used.		
Chapter 2	**Test cases for simple programs**	**4 lectures**
Write simple programs make use of loops and control structures. Write Test Cases for above programs.		
Chapter 3	**Test cases and Test plan**	**4 lectures**
Write Test Plan for given application with resources required. Write Test case for given application. Prepare Test report for test cases executed.		
Chapter 4	**Defect Report**	**3 lectures**
Defect Life Cycle Classification of Defect Write Defect Report		
Chapter 5	**Testing Tools**	**3 lectures**
How to make use of Automation Tools Types of Testing Tools		
Demonstration	**Programming Assignments**	**18 Lect**

Out of 36 lectures, 18 are assigned for demonstration. Teacher should give demonstration of various assignments based on above theory topics in the classroom or in the laboratory as per their convenience. Demonstration of any open source testing tool should be given.

Programming assignments should be done individually by the student in their respective login from the list given in Labbook. The code/ documentation should be uploaded on either the local server, Moodle, Github or any LMS.

Reference Books:

1. Software Engineering – A Practitioners Approach, Roger S. Pressman, 7thEdition, Tata McGraw Hill, 20
2. Effective Methods of Software Testing, William E Perry, 3rd Edition, Wiley Publishing Inc
3. Managing the Testing Process: Practical Tools and Techniques for Managing Hardware and Software Testing, Rex Black, Microsoft Press, 1999
4. Software Testing Principles and Practices by Srinivasan Desikan, Gopalaswamy Ramesh, Pearson.