

<p style="text-align: center;"><b>Savitribai Phule Pune University</b>  <b>T.Y.B.Sc. (Computer Science) - Sem – V</b>  <b>Course Type: SECC – I                      Course Code : CS-3510</b>  <b>Course Title: Python Programming</b></p>		
Teaching Scheme 03 Lect / week	No. of Credits 2	Examination Scheme: IE : 15 marks UE: 35 marks
<b>Course Objectives</b> <ol style="list-style-type: none"> <li>1. To introduce programming concepts using python</li> <li>2. Student should be able to develop Programming logic using python</li> <li>3. To develop basic concepts and terminology of python programming</li> <li>4. To test and execute python programs</li> </ol>		
<b>Course Outcomes</b> On completion of the course, student will be able to– <ul style="list-style-type: none"> <li>• Develop logic for problem solving</li> <li>• Determine the methods to create and develop <b>Python programs</b> by utilizing the data structures like lists, dictionaries, tuples and sets.</li> <li>• To be familiar about the basic constructs of programming such as data, operations, conditions, loops, functions etc.</li> <li>• To write python programs and develop a small application project</li> </ul>		
<b>Course Contents</b>		
<b>Chapter 1</b>	<b>An Introduction to Python</b>	<b>3 Lect</b>
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.		
<b>Chapter 2</b>	<b>Control Statements</b>	<b>4 Lect</b>
<b>Sequence Control</b> – Precedence of operators, Type conversion <b>Conditional Statements:</b> if, if-else, nested if-else, <b>Looping-</b> for, while, nested loops, loop control statements (break, continue, pass) a. <b>Strings:</b> declaration, manipulation, special operations, escape character, string formatting operator, Raw String, Unicode strings, Built-in String methods.		
<b>Chapter 3</b>	<b>Lists, functions, tuples and dictionaries, Sets</b>	<b>7 Lect</b>
<b>Python Lists:</b> 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. <b>Functions:</b> 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.		

<b>Tuples and Dictionaries:</b> 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. <b>Sets-</b> Definition, transaction of set(Adding, Union, intersection), working with sets		
<b>Chapter 4</b>	<b>Modules ,Working with files, Exception handling</b>	<b>4 Lect</b>
<b>Modules:</b> Importing module, Creating & exploring modules, Math module, Random module, Time module <b>Packages:</b> Importing package, creating package,examples <b>Working with files:</b> 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 <b>Regular Expression-</b> Concept of regular expression, various types of regular expressions, using match function. <b>Exception Handling:</b> Built-in Exceptions, Handling Exceptions, Exception with Arguments, User-defined Exceptions.		
<b>Demonstration</b>	<b>Programming Assignments:</b>	<b>18 Lect</b>
<b>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.</b>  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		
<b>Reference Books:</b>		
<ol style="list-style-type: none"> <li>1. An Introduction to Computer Science using Python 3 by Jason Montojo, Jennifer Campbell, Paul Gries, The pragmatic bookshelf-2013</li> <li>2. James Payne, “Beginning Python: Using Python and Python 3.1,Wrox Publication</li> <li>3. Introduction to Computer Science Using Python- Charles Dierbach, Wiley Publication Learning with Python “, Green Tea Press, 2002</li> <li>4. Introduction to Problem Solving with Python by E balguruswamy,TMH publication-2016</li> <li>5. Beginning Programming with Python for Dummies Paperback – 2015 by John Paul Mueller</li> <li>6. Object-oriented Programming in Python, Michael H. Goldwasser, David Letscher, Pearson Prentice Hall-2008</li> </ol>		