CSA08 PYTHON PROGRAMMING 3 0 2 4

Prerequisite Nil

Course Objectives The course on Python Programming aims to provide the students with the following:

1. To know the basics of Python Program
2. To develop Python programs with conditionals and loops and to use Python functions by parameter passing.
3. To use Python data structures –- lists, tuples, dictionaries.
4. To do input/output with files in Python
5. To access CSV file and plot the graph

Course Outcomes On successful completion of the course, the student will be able to:

1. Find solutions to simple computational problems
2. Decompose a Python program into functions and develop programs with conditional, loop constructs and strings
3. Represent compound data using Python lists, tuples, and dictionaries.
4. Read and write data from/to files in Python Programs and create modules and packages.
5. Access CSV file and plot different graphs by connecting the database

UNIT I INTRODUCTION, DATA, EXPRESSIONS, STATEMENTS

Python interpreter and interactive mode; values and types: int, float, boolean, string, an list; variables, expressions, statements, tuple assignment, precedence of operators, comments; modules and functions, function definition and use, flow of execution, parameters and arguments; algorithmic problem solving.

UNIT II CONTROL FLOW, FUNCTIONS

Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else); Iteration: state, while, for, break, continue, pass; Fruitful functions: return values, parameters, local and global scope, function composition, recursion; Strings: string slices, immutability, string functions and methods, string module; Lists as arrays.

UNIT III LISTS, TUPLES, DICTIONARIES

Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Tuples: tuple assignment, tuple as return value; Dictionaries: operations and methods; advanced list processing – list comprehension;

UNIT IV FILES, MODULES, PACKAGES

Files and exception: text files, reading and writing files, format operator; command line arguments, errors and exceptions, handling exceptions, modules, packages;

UNIT V PYTHON TO CONTROL AND DOCUMENTING DATA SCIENCE PROCESSES

Data types and objects, loading packages, namespaces, Reading and writing data, Simple plotting, Control flow, Debugging, Code profiling, Acquiring Data with Python: Loading from CSV files, Accessing SQL databases,

TEXT BOOKS

1. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist‘‘, 2nd edition, Updated for Python 3, Shroff/O‘Reilly Publishers, 2016 (http://greenteapress.com/wp/think-python/)
2. Guido van Rossum and Fred L. Drake Jr, "An Introduction to Python – Revised and updated for Python 3.2", Network Theory Ltd., 2011

REFERENCES

1. John V Guttag, "Introduction to Computation and Programming Using Python‘‘, Revised and expanded Edition, MIT Press , 2013
2. Robert Sedgewick, Kevin Wayne, Robert Dondero, "Introduction to Programming in Python: An Inter-disciplinary Approach", Pearson India Education Services Pvt. Ltd., 2016.
3. Timothy A. Budd, "Exploring Python", Mc-Graw Hill Education (India) Private Ltd.,, 2015.
4. Kenneth A. Lambert, "Fundamentals of Python: First Programs", CENGAGE Learning, 2012.
5. Charles Dierbach, "Introduction to Computer Science using Python: A Computational Problem-Solving Focus", Wiley India Edition, 2013.
6. Paul Gries, Jennifer Campbell and Jason Montojo, "Practical Programming: An Introduction to Computer Science using Python 3", Second edition, Pragmatic Programmers, LLC, 2013.