CC5: Python Programming   [Credit: 4, Lecture Hours: 60]

Course Objective:
This course covers the basics and advanced Python programming to harness its potential for modern computing requirements.

Unit 1: Introduction and overview   (10 Lectures)
Introduction, What is Python, Origin, Comparison, Comments, Operators, Variables and Assignment, Numbers, Strings, Lists and Tuples, Dictionaries, if Statement, while Loop, for Loop and the range() Built-in Function, Files and the open() Built-in Function, Errors and Exceptions, Functions, Classes, Modules Syntax and Style Statements and Syntax, Variable Assignment, Identifiers, Basic Style Guidelines, Memory Management, Python Application Examples

Unit 2: Python Objects   (10 Lectures)
Python Objects, Standard Types, Other Built-in Types, Internal Types, Standard Type Operators, Standard Type Built-in Functions, Introduction to Numbers, Integers, Floating Point Real Numbers, Complex Numbers, Operators, Built-in Functions. Sequences: Strings, Lists, and Tuples, Sequences, Strings, Strings and Operators, String-only Operators, Categorizing the Standard Types, Unsupported Types. Numbers and Strings. Built-in Functions, String Built-in Methods, Special Features of Strings

Unit 3: Lists   (10 Lectures)
Operators, Built-in Functions, List Type Built-in Methods, Special Features of Lists, Tuples, Tuple Operators and Built-in Functions, Special Features of Tuples
Dictionaries
Introduction to Dictionaries, Operators, Built-in Functions, Built-in Methods, Dictionary Keys, **Conditionals and Loops:** if statement, else Statement, elif Statement, while Statement, for Statement, break Statement, continue Statement, pass Statement, else Statement

Unit 4: Files and Input/Output   (10 Lectures)
File Objects, File Built-in Function, File Built-in Methods, File Built-in Attributes, Standard Files, Command-line Arguments, File System, File Execution, Persistent Storage Modules

Unit 5: Advance topics   (10 Lectures)
Security – Encryption and Decryption , Classical Cyphers
Graphics and GUI Programming – Drawing using Turtle, Tkinter and Python, Other GUIs

Unit 6: Errors and Exceptions   (10 Lectures)
What Are Exceptions? Exceptions in Python, Detecting and Handling Exceptions, Exceptions as Strings, Raising Exceptions, Assertions, Standard Exceptions
Functions: Functions, Calling Functions, Creating Functions, Formal Arguments, Positional Arguments, Default Arguments, Why Default Arguments?, Default Function Object Argument Example, Variable- length Arguments, Non-keyword Variable Arguments (Tuple), Keyword Variable Arguments (Dictionary)

Poddar
5/2/21

Principal
C. M. COLLEGE
Darbhanga

Software Lab Based on Python: Students are advised to do laboratory/practical practice.

Reference Books:

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

2. R. Nageswara Rao, "Core Python Programming", dreamtech

3. Wesley J. Chun. "Core Python Programming - Second Edition", Prentice Hall

4. Michael T. Goodrich, Roberto Tamassia, Michael H. Goldwasser, "Data Structures and Algorithms in Pyhon", Wiley

5. Kenneth A. Lambert, "Fundamentals of Python – First Programs", CENGAGE Publication

6. Luke Sneeringer, "Professional Python", Wrox

7. "Hacking Secret Ciphers with Python", Al Sweigart, URL- https://inventwithpython.com/hacking/chapters

Course Outcome:

After learning the course, the student will be able:
1. To develop proficiency in creating based applications using the Python Programming Language.
2. To be able to understand the various data structures available in Python programming language and apply them in solving computational problems.
3. To be able to do testing and debugging of code written in Python.
4. To be able to draw various kinds of plots using PyLab.
5. To be able to do text filtering with regular expressions in Python
6. To be able to create socket applications in Python
7. To be able to create GUI applications in Python