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21BC104 PYTHON PROGRAMMING

Course Description and Objectives:

This course is aimed at offering the fundamental concepts of Python scripting language to the students. It starts with the basics of Python programming and deals with lists, dictionaries, functions, exceptions and files. The objective of this course is to enable the students to develop the applications using the concepts of Python.

Course Outcomes:

The student will be able to:

- Understand the basic terminology used in computer programming to write, compile and debug programs in Python programming language.
- Use different data types to design programs involving decisions, loops, and functions.
- Handle the exceptions which are raised during the execution of Python scripts.
- Implement files and classes in the Python programming environment.

Skills

- Identify suitable data types for an application.
- Use control statements for decision making problems.
- Design an application to perform various operations using classes.
- Create a list of data and perform operations on data.

Activities:

- Utilization of data types such as lists, tuples, dictionaries and sets.
- Develop functions (built-in and user-defined)
- Implement file operations.
- Perform operations such as display, calculate, add, delete and modify on data from applications.
- Implement matrix operations.

Syllabus

UNIT - I **12 Hours**

INSTALLATION, DATA TYPES AND INPUT/OUTPUT**:** Importance of Python, Installing Python in Windows & Ubuntu, Executing Python programs, Comments in Python, Internal working of Python, Python character set, Tokens, Python Core Data

Types, The print () function, Assignment of values to variables, The input() function, The eval() function.

UNIT - II **12 Hours**

OPERATORS AND CONTROL STATEMENTS: Operators- Arithmetic Operators, Operator precedence and Associativity, Bitwise operator, The compound assignment operator; Decision statements- Boolean operators, Boolean Expressions and Relational operators, Decision making statements; Loop Control Statements-while loop, range() function, for loop; break statement, continue statement.

UNIT - III **12 Hours**

FUNCTIONS AND LISTS: Functions- Syntax and basics of a function, Use of a function, Parameters and arguments in a function, The local and global scope of a variable, The return statement, Recursive functions, The lambda function; Lists-Creating Lists, Accessing the elements of a List, List slicing, Python in-built functions for lists, List Comprehension, List Methods, Passing list to a function, Returning a list to function.

UNIT - IV **12 Hours**

TUPLES, SETS AND DICTIONARIES: Tuples - **C**reating tuples, tuple() function, Inbuilt functions for tuples, Indexing and Slicing, Operations on tuples, Passing variable length arguments to tuples, Sort tuples, Traverse tuples from a list, The zip() function, The Inverse zip(*) function; Sets - Creating sets, The set in and not in operator, The Python Set Class, Set operations; Dictionaries -Basics of Dictionaries, Creating a Dictionary, Adding and replacing values, Retrieving values, Formatting dictionaries, Deleting items, Comparing two dictionaries, Methods of dictionary class, Traversing dictionaries, Nested dictionaries, Traversing nested dictionaries.

UNIT - V **10 Hours**

FILES: File Handling-Opening a file, Writing Text, Closing files, Writing numbers to a file, Reading Text, Reading numbers from a file, Appending data, seek() function.

TEXTBOOK:

Ashok Namdev kamthane and Amit Ashok Kamthane, "Programming and Problem solving with PYTHON", 1st Edition, McGraw Hill Education, 2016.

REFERENCE BOOKS:

1. Allen Downey, "Think Python", 1st Edition, Green Tea Press, 2016.
2. W.J. Chun, "Core Python Programming", 3rd Edition, Prentice Hall, 2013.
3. Kenneth A. Lambert, "Fundamentals of Python", 2st Edition, Cengage, 2015.