CLUSTER UNIVERSITY SRINAGAR
SYLLABUS (FYUP UNDER NEP 2020)
Offered By Department of INFORMATION TECHNOLOGY
Semester 2ⁿᵈ Skill Enhancement Course (SEC)

Course Title: Basics of Software Development Using Python-II

Course Code: UGICT22S201
Credits: 4 (Theory: 1, Practical: 3)
Contact Hrs: 105 (Theory: 15, Practical: 90)

Max. Marks 100
Theory External: 15; Min Marks: 06
Theory Internal (Continuous Assessment): 10 Marks, Min Marks: 04
Practical Experimental Basis= 45 Marks, Min. Marks: 18
Practical Internal (Continuous Assessment): 30 Marks, Min. Marks: 12

Course Objectives: This course aims to introduce the learners to object-oriented programming concepts and software development using Python language.

Course Outcomes: After completion of this skill course the learner should be able to:
- Develop Python programs using Object-oriented concepts
- Develop Python programs using advanced data types like strings, lists, tuples, sets, and dictionaries.
- Read and write data from/to files in Python Programs.
- Use Exception handling in Python applications for error-handling.

THEORY
UNIT-I
Object-Oriented Programming Concepts:
Introduction to Procedural Programming, Issues with Procedural Programming, Introduction to Object Oriented Programming (OOP), Procedure Oriented versus Object Oriented Programming, Basic Concepts of OOPS: Classes, Objects, Data Abstraction, Data Encapsulation, Inheritance, Polymorphism, Dynamic Binding, Message Passing; Advantages and Disadvantages of OOPS, Application of OOPS.

PRACTICALS
UNIT-II
Advanced Data types in Python:
Strings: Creating and Storing Strings, Basic String Operations, Accessing Characters in String by Index Number, String Slicing and Joining, String Methods, Formatting Strings; **Lists**: Creating Lists, Basic List Operations, Indexing and Slicing Lists, List Built-In Functions, List Methods; **Dictionaries:** Creating Dictionary, Accessing and Modifying key: value pairs, Dictionary Built-in functions, Dictionary Methods, Traversing Dictionaries; **Tuples:** Creating Tuples, Basic Tuple Operations, Indexing and Slicing in Tuples, Built-In Functionson Tuples, Tuple Methods; **Sets**: Creating Sets, Set Methods, Set traversal, Frozenset.

UNIT-III
Exception and File Handling in Python:
Exception Handling: Introduction to errors and exceptions, handling exceptions, multipleexcept blocks, multiple exceptions in a single block, except block without exception, the else clause, raising exceptions, built-in and user-defined exceptions, assertions and finallyblock.
File Handling: Types of Files, Creating Files, Opening and Closing files,Reading and Writing Text Files, Understanding Read functions: read(), readline() and readlines(), Understanding Write functions: write() and writelines(), Manipulating file pointer using seek(),File Access Modes, Reading and Writing Binary Files, Renaming and Deleting Files.

UNIT-IV

Object Oriented Programming Concepts:

Classes and Objects: Defining classes and objects in Python, Creating Class and Object, Adding Attributes to a Class, Adding Methods to a Class, self argument, init() method, del() method, other special methods. Static methods, public and private data members, private methods, Method Overloading, Operator Overloading, Parameterized, and Non- parameterized Constructors.

Inheritance: Inheriting classes in python, Types of inheritance: Single, Multi-Level, Multiple and Hierarchical Inheritance, Super (), Method Overriding, Abstract Classes and Interfaces.

Python Modules : Importing Modules, Packages in Python, Creating Packages and sub- packages.

Recommended Books:

1. Python: The Complete Reference, Martin C Brown, Mc Graw Hill.
2. Learning Python, Mark Lutz, O'Reilly Publications.
3. Programming and Problem Solving with Python: Ashok N Kamthane and Amit AKamthane, McGraw Hill.