



SEMESTER – VI

| BRANCH                  | SUBJECT TITLE           | SUBJECT CODE |
|-------------------------|-------------------------|--------------|
| COMPUTER SCIENCE (DSE2) | Programming with Python | CSDSE2- 161  |

**Course Learning Outcomes (CLO) - After studying this subject, students shall be able to –**

- Interpret the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements.
- Express proficiency in the handling of strings, functions and file handling.
- Determine the methods to create and manipulate Python programs by utilizing the data structures like lists, dictionaries, tuples and sets.
- Articulate the Object-Oriented Programming concepts such as encapsulation, inheritance and polymorphism as used in Python with class, modules and packages.
- Identify the commonly used operations involving database connectivity and use of tkinter for GUI programming

**CONTENT**

**Unit - 1**

Python Basics Python interpreter, Python idle, dynamically typed and strongly typed features, basic data types, variables, expressions, statements, operators, flow of execution. Input and Output statements, Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else) Iteration: while, for, break, continue, pass, implementing "for through range()", 'in' and 'not in' operators for sequence traversal. Creating and executing py scripts.

**Unit - 2**

Data Structures: Lists append, extend, insert, index, remove, pop, count, sort, reverse, slicing, list comprehension, Copying a list: deep copy, shallow copy. Tuples index, count, usage, use of tuples as a swap function. Dictionaries-keys, values, tuples, nested dictionaries, dictionary comprehension. Strings - Single line and multi-line strings, formatter, isdigit, isalpha, isalnum, islower, istitle, isspace, title, lower, upper, strip, split, splitlines, join etc. Sets - union, intersection, subset, superset, difference, symmetric difference, copy, add, remove, discard etc.

**Unit - 3**

Functions & File Handling: Inbuilt Functions-id, len, chr, ord etc., defining and calling a function, arguments, global versus local variables, defining and using lambda functions, the map(), filter(), reduce() functions. Working with files: read, write and append modes: r, w, a, x, r+, w+, a+, x+, reading-read(), readline(), readlines(), writing-write(), writelines(), seek(), tell(). Word count, copy file scripts through file handling concepts.

**Unit - 4**



Classes, modules and exceptional handling : Classes: Introduction, Member variables and defining methods, constructor, destructor, data encapsulation, inheritance, multiple inheritance, diamond problem solving technique of python. Modules: inbuilt modules sys, random, time etc. import, from...import, from import Constructing packages, role of init py Exceptional Handling: The try-except-else-finally block, the raise statement, the hierarchy of exceptions, adding exceptions.

## Unit - 5

Database & GUI Programming: Importing sqlite, connecting to database, creating table, insert, select, update, delete, drop tables, accessing and modifying tables through python. Graphical user interfaces, event-driven programming paradigm, tkinter module, creating simple GUI; buttons, labels, entry fields, dialogs, widget attributes sizes, fonts, colors layouts, nested frames.

### Textbooks, Reference Books, Other Resources -

#### Textbooks:

1. Taneja Sheetal & Kumar Naveen, "Python Programming. A modular approach", Pearson.
2. Liang Y Daniel, "Introduction to Programming Using Python", Pearson.

#### Reference Books:

1. Zed A. Shaw, "Learn Python the Hard Way", Zed Shaw's Hard Way Series
2. Charles Dierbach, "Introduction to Computer Science using Python", Wiley.
3. Michael T. Goodrich, "Data Structures and Algorithms in Python", Wiley.