22DS1T2: OBJECT ORIENTED PROGRAMMING

Course Name	Object Oriented Programming		L	T	P	C	CIA	SEE	TM
Course Code	22DS1T2		4	0	0	4	30	70	100
Year of Introduction: 2021	**Year of Offering:** 2022	**Year of Revision**: No Revision			**Percentage of Revision:** Nil				
L-Lecture, T-Tutorial, **P**-Practical, **C**-Credits, **CIA**-Internal Marks, **SEE**-External Marks, **TM**-Total Marks									

Course Description and Purpose: Python Programming is a course that illustrates basic concepts of *Python Programming*, *Decision Control Statements*, *Functions and Modules*, *Python Strings Revisited*, *Data Structures*, *Classes and Objects*, *Inheritance*, *Operator Overloading*, *Pandas*, *Error and Exception Handling*, *File Handling*, *Numpy*, *Matplotlib*.

Course Objectives:
This course will help enable the students to understand, learn and develop a various *Decision Control Statements*, *Functions & Modules*, *Strings*, *Data Structures*, *Classes and Objects*, *Inheritance*, *Operator Overloading*, *Pandas*, *Error and Exception Handling*, *Handling Files* and *Databases*.

Specific objectives include:
- ✓ To understand basics of *Python Programming*.
- ✓ To gain knowledge on *Decision Control Statements* and *Functions & Modules and Python Strings* and *Data Structures*.
- ✓ To gain knowledge on *Classes & Objects, Inheritance.*
- ✓ To apply *Operator Overloading, Error and Exception Handling* and Pandas.
- ✓ To gain knowledge on File Handling, Database Connection, Basics of *Numpy* and *matplotlib*.

Course Learning Outcomes:
Upon successful completion of the course, the student will be able to:
CO1: Understand basics of Python Programming.
CO2: Gain knowledge on *Decision Control Statements* and *Functions & Modules* and *Python Strings* and *Data Structures*.
CO3: Gain knowledge on *Classes & Objects & Inheritance.*
CO4: Apply Operator Overloading, Error and Exception Handling and Pandas.
CO5: Gain Knowledge on File Handling, Database Connection and basics of Numpy and matplotlib

UNIT I (12 Hours)

Basics of Python Programming: Features of Python - History of Python - The Future of Python - Writing and Executing First Python Program - Literal Constants - Variables and Identifiers - Data Types - Input Operation - Comments - Reserved Words - Indentation - Operators and Expressions - Expressions in Python - Operations on Strings - Other Data Types - Type Conversion.
Decision Control Statements: Conditional Branching Statements - Basic Loop Structures - Nested Loops - The Break Statement - The Continue Statement - The Pass Statement - The Else Statement used with Loops.

UNIT II (12 Hours)

Functions and Modules: Function Definition - Function Call - Variable Scope and Lifetime - The Return Statement - More on Defining Functions - Recursive Functions - Modules - Packages in Python - Standard Library Modules.
Python Strings Revisited: Concatenating - Appending and Multiplying Strings - String Formatting Operator - Built in String Methods and Functions - Comparing Strings - Regular Expressions.
Data Structures: Sequence - Lists - Functional Programming - Tuple - Sets - Dictionaries.

UNIT III (12 Hours)

Classes and Objects: Classes and Objects - Class Method and self Argument - Class Variables and Object Variables - Public and Private Data Members - Private Methods - Calling a Class Method from Another Class Method - Built in Class Attributes - Class Methods - Static Methods.

Inheritance: Inheriting Classes in Python - Types of Inheritance - Abstract Classes and Interfaces.

UNIT IV (12 Hours)

Operator Overloading: Concept of Operator Overloading - Advantage of Operator Overloading - Implementing Operator Overloading.

Pandas: Introduction - Getting Started - Series - Data Frame - Read CSV - Read JSON -Analyzing Data Frames - Cleaning Data - Cleaning Empty Cell - Cleaning Wrong Format - Cleaning Wrong Data - Removing Duplicates - Correlations - Plotting.

Error and Exception Handling: Introduction to Errors and Exceptions - Handling Exceptions - Raising Exceptions - Built in and User defined Exceptions.

UNIT V (12 Hours)

File Handling: File Path - Types of Files - Opening and Closing Files - Reading and Writing Files.

Databases: Database Table Creation - Select Operation - Insert Operation - Delete Operation - Update Operation - Drop Table.

Numpy: Basic Functions of Numpy.

Matplotlib: Basic Functions of Matplotlib.

Reference Text Books:

1. Reema Thareja, Python Programming Using Problem Solving Approach, Oxford University Press, June 2017.
2. Vamsi Kurama, Python Programming, A Modern Approach, Pearson, 2017.
3. Wesley Chun, Core Python Programming, Prentice Hall, December 2000.

e-resources: https://www.w3schools.com/python/pandas/

PARVATHANENI BRAHMAYYA SIDDHARTHA COLLEGE OF ARTS & SCIENCE

(An Autonomous College in the jurisdiction of Krishna University)

M.Sc.(Computer Science), First Semester

Course Name: OBJECT ORIENTED PROGRAMMING

Course Code: 22DS1T2

(w.e.f admitted batch 2022-23)

SECTION-A

Time: 3 Hours **Max Marks: 70**

Answer ALL questions **(5×4 = 20 Marks)**

1. a) Explain *Future of Python* (CO1,L2)
   (or)
   b) Explain different *Data Types* in *Python* (CO1,L2)
2. a) What is *Recursive Function*? Explain with *example*.(CO2,L1)
   (or)
   b) List out and explain any *4 Built in String Method*?(CO2,L1)
3. a) Whit is the *Differences between Class Variable and Object Variable*?(CO3,L1)
   (or)
   b) List out *Built in Class Attributes*? (CO3,L1)
4. a) Explain *Advantages of Operator Overloading*? (CO4,L2)
   (or)
   b) Explain *Exception Hierarchy*? (CO4,L2)
5. a) Explain *Types of Plots in Matplotlib*? (CO5,L2)
   (or)
   b) Explain different *ways of creating Arrays* using *Numpy*. (CO5,L2)

SECTION-B

Answer Five Questions Choosing One Question from Each Unit.

All Questions Carry Equal Marks. **(5×10 = 50 Marks)**

6.a) Explain the *features of Python Programming Language.*(CO1,L2)
(or)
b)Explain *Different Loops* in Python with example. (CO1,L2)

7.a) Apply *Modules Concept in Python with examples*. (CO2,L3)
(or)
b) Build the List *Data Structure and their built in functions* with examples. (CO2,L3)

8.a) What are *Classes and Objects*? Write a program in Python to illustrate an *instancevariable*. (CO3,L1)
(or)
b)What is *Inheritance*? Explain *different types of Inheritance.* (CO3,L1)

9.a) Explain how to *Implement Operator Overloading* in Python. (CO4,L2)
(or)
b)Explain *process of Analyzing Data Frames*. (CO4,L2)

10.a) Explain *process of Writing and Reading data from file with example*. (CO5,L5)
(or)
b)Explain process of *Update Data* into *Database* with *relevant examples*. (CO5,L5)