PARVATHANENI BRAHMAYYA SIDDHARTHA COLLEGE OF ARTS & SCIENCE
(An Autonomous College in the jurisdiction of Krishna University)
22OE305: PYTHON PROGRAMMING

Course Name	Python Programming		**L**	**T**	**P**	**C**	**CIA**	**SEE**	**TM**
Course Code	22OE305		3	0	0	3	30	70	100
Year of Introduction: 2019	**Year of Offering:** 2023	**Year of Revision**: 2023			**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, and Operator Overloading.

Course Objectives: This course will help enable the students t o understand, learn and develop a various Decision Control Statements, Functions & Modules, Strings, Data Structures, Classes and Objects, Inheritance, and Operator Overloading.

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

Course Learning Outcomes:
Upon successful completion of the course, the student will be able to:
CO1: Have a foundational understanding of Python programming, including its features, historical context, and future prospects, and will be able to write and execute basic Python programs, work with literal constants, variables, data types, input operations, comments, reserved words, indentation, operators, and expressions, including operations on strings and other data types, along with type conversion.
CO2: Proficiency in using decision control statements, including conditional branching, loop structures, nested loops, and related control statements like break, continue, pass, and the integration of the else statement with loops in Python for effective program control flow.
CO3: Possess a comprehensive understanding of Python string manipulation, including concatenation, formatting, and regular expressions, as well as proficiency in working with various data structures such as sequences (lists, tuples), sets, dictionaries, and functional programming concepts in Python, enabling them to manipulate data effectively in Python programs.
CO4: Have solid grasp of object-oriented programming concepts in Python, including classes, objects, class methods, instance variables, private data members, and the use of built-in class attributes, enabling them to design and work with Python classes effectively.
CO5: Understand the concepts of inheritance in Python, including various types of inheritance, abstract classes, and interfaces. Additionally, they will be proficient in error and exception handling, encompassing the identification and management of exceptions, both built-in and user-defined. Furthermore, students will have the capability to implement operator overloading in Python, recognizing its advantages and practical applications.

UNIT-I

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.

UNIT-II

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.
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.

UNIT-III

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-IV

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.

UNIT-V

Inheritance: Inheriting Classes in Python, Types of Inheritance, Abstract Classes and Interfaces.
Error and Exception Handling: Introduction to Errors and Exceptions, Handling Exceptions, Raising Exceptions, Built- in and User defined Exceptions
Operator Overloading: Concept of Operator Overloading, Advantage of Operator Overloading, Implementing Operator Overloading.

Text Book:

1. Reema Thareja, Python Programming Using Problem Solving Approach, Oxford University Press, June 2017.

Reference Books:

1. Vamsi Kurama, Python Programming, A Modern Approach, Pearson, 2017.
2. Wesley Chun, Core Python Programming, Prentice Hall, December 2000.

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

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Course Name: Python Programming

Course Code: 22OE305

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

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

SECTION-A

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) What are *break* and *continue* statements?(CO2,L1)

3. (a) What is *Appending* and *multiplying Strings*? (CO3,L1)

(or)

(b) Write in short about *Dictionaries.*(CO3,L1)

4. (a) What is *class method* and *self argument*? (CO4,L2)

(or)

(b) Differentiate *Class Variables* and *static variables*.(CO4,L2)

5. (a) Explain *Advantages of Operator Overloading.* (CO5,L2)

(or)

(b) What is *Exception Handling?* (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 various *Operators* in Python with examples.(CO1,L2)

7. (a) Apply *Different Loops* in Python with example. (CO2.L3)

(or)

(b) Apply *Modules Concept* in Python with examples. (CO2, L3)

8. (a) Explain *Built in String methods* with examples.(CO3,L1)

(or)

(b) Build the *List Data Structure* and their built in functions with examples. (CO3,L1)

9. (a) What are C*lasses* and *Objects* ? Illustrate classes and objects in python.(CO4,L2)

(or)

(b) Explain *Class Methods* and *Static Methods* with examples. (CO4,L2)

10. (a) Explain different *Types of Inheritance* with an example. (CO5,L5)

(or)

(b) Explain how to Implement *Operator Overloading* in Python. (CO5,L5)