PROGRAMMING FOR PROBLEM SOLVING USING PYTHON

II Semester: CE

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
ACSB38	Core	3	0	0	3	30	70	100
Contact Classes: 45	Tutorial Classes: Nil	Practical Classes: Nil				Total Classes: 45		

OBJECTIVES:

The course should enable the students to:

I. Understand the fundamentals of Python programming concepts and its applications.
II. Improve problem solving skills using control structures and lists.
III. Understand the basics of object-oriented concepts using Python.
IV. Apply string handling to solve real-time problems.
V. Design and implement programs using functions.

COURSE OUTCOMES (COs):

CO 1	Understand and comprehend the basics of python programming.
CO 2	Express different conditional and decision making statements used to develop python applications.
CO 3	Learn and implement various data structures provided by python library including string, list, dictionary and its operations etc
CO 4	Define and demonstrate the use of the built-in functions and better usage of string methods in the development of python programming.
CO 5	Develop real-world applications by using various object oriented programming concepts.

COURSE LEARNING OUTCOMES (CLOs):

1. Describe the Features of python, Data types.
2. Summarize the concept of various operators.
3. Describe the usage of different input and output functions.
4. Understand importance of membership and identity operators.
5. Describe the various control structures.
6. Determine different conditional blocks of if statements.
7. Describe the usage of for and while loop.
8. Understand break, continue and return statements.
9. Summarize the concept of list creation and manipulations.
10. Describe the usage of tuple data type and its methods.
11. Determine the usage of dictionaries.
12. Understand importance of arrays in python.
13. Understand Creating strings and basic operations on strings.
14. Analyze the concept of String testing methods, Defining a function.
15. Illustrate Calling a function, Returning multiple values from a function.
16. Contrast the Usage of Functions are first class objects, Formal and actual arguments,
17. Define Positional arguments, Recursive functions.
18. Identify the features of Object Oriented Programming System (OOPS).
19. Use the concept of Classes and Objects, Encapsulation, Abstraction, Inheritance, and Polymorphism.
20. Describe types of variables and methods.

MODULE-I	INTRODUCTION TO PYTHON
Introduction to Python: Python Identifiers, Keywords, Datatypes in python: buitin datatypes, bool datatype, sequences, sets. Input and Output statements, Operators: arithmetic operators, assignment operators, comparison operators, logical operators, identity operators, membership operators, bitwise operators.	
MODULE-II	**CONTROL STRUCTURES**
Conditional Control structures: Conditional blocks using if statement, if-else statement, if- elif statement,Range function. Loops: for loops, Nested for loop, while loop, pass, continue, break statements.	
MODULE-III	**LIST, TUPLES ,DICTIONARY AND ARRAYS**
Creating List, List manipulation – index(), append(), insert(), copy(), extend(), count(), remove(), pop(), reverse(), sort(),len(),nested list. Creating a tuple, accessing a tuple element, basic operations on tuples, tuples manipulations – len(),min(), max(), count(),index(), sorted().Creation of dictionary, operations on dictionaries, dictionaries methods Array: creating an array, importing array module, indexing and slicing. processing the arrays, arrays using numpy, array creation using numpy, transpose, addition and multiplication of matrices..	
MODULE-IV	**STRINGS AND FUNCTIONS**
Creating a string, methods – length(), indexing(), slicing(), repeating(), concatenation(), comparing(), remove(), removing spaces, finding substring, inserting a sub string in to a string, finding number of characters and words. Functions: Defining a function, Calling a function, returning multiple values from a function, functions are first class objects, formal and actual arguments, positional arguments, recursive functions, Powerful Lamda function in python	
MODULE-V	**INTRODUCTION TO OOPS**
Introduction to Object Oriented Concepts: Features of Object oriented programming system (OOPS) – Classes and Objects, Encapsulation, Abstraction, Inheritance, Polymorphism. Classes and Objects: Concept of class, object and instances, Creating a class, The Self variable, constructor, Types of Variables, Types of Methods.	

Text Books:

1. R Nageswara Rao, "Core Python Programming", Dreamtech Press, 2nd Edition, 2017.
2. Dusty Philips, "Python 3 Object Oriented Programming", PACKT Publishing, 2nd Edition, 2015.

Reference Books:

1. Michael H.Goldwasser, David Letscher, "Object Oriented Programming in Python", Prentice Hall, 1st Edition, 2007.

Web References:

1. https://realpython.com/python3-object-oriented-programming/
2. https://python.swaroopch.com/oop.html
3. https://python-textbok.readthedocs.io/en/1.0/Object_Oriented_Programming.html
4. https://www.programiz.com/python-programming/

E-Text Books:

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3. https://python-textbok.readthedocs.io/en/1.0/Object_Oriented_Programming.html
4. https://www.programiz.com/python-programming/