

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	Foundation	3	-	-	3	30	70	100															
Contact Classes: 45	Tutorial Classes: Nil	Practical Classes: Nil			Total Classes: 45																		
<p>I. COURSE OVERVIEW:</p> <p>This course explains the fundamental ideas behind the object oriented approach to programming. Knowledge of python helps to create the latest innovations in programming. Like the successful computer languages that came before, python is the blend of the best elements of its rich heritage combined with the innovative concepts required by its unique environment. This course involves OOP concepts, python basics, inheritance, polymorphism, interfaces, packages, Exception handling. This course is presented to students by power point projections, course handouts, lecture notes, assignments, objective and subjective tests.</p> <p>II. OBJECTIVES:</p> <p>The course should enable the students to:</p> <ol style="list-style-type: none"> 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. Describe string handling to solve real-time problems. V. Design and implement programs using functions. <p>III. COURSE OUTCOMES (COs):</p> <table border="0"> <thead> <tr> <th>COs</th> <th>Course Outcome</th> </tr> </thead> <tbody> <tr> <td>CO 1</td> <td>Understand and comprehend the basics of python programming.</td> </tr> <tr> <td>CO 2</td> <td>Express different conditional and decision-making statements used to develop python applications.</td> </tr> <tr> <td>CO 3</td> <td>Learn and implement various data structures provided by python library including string, list, dictionary and its operations etc.</td> </tr> <tr> <td>CO 4</td> <td>Define and demonstrate the use of the built-in functions and better usage of string methods in the development of python programming.</td> </tr> <tr> <td>CO 5</td> <td>Develop real-world applications by using various object-oriented programming concepts.</td> </tr> </tbody> </table> <p>IV. SYLLABUS:</p> <table border="1" style="width: 100%;"> <tr> <td style="width: 15%;">MODULE - I</td> <td style="width: 60%;">INTRODUCTION TO PYTHON</td> <td style="width: 25%;">Classes: 10</td> </tr> </table> <p>Introduction to Python: Python Identifiers, Keywords, datatypes in python: built-in datatypes, bool datatype, sequences, sets. input and output statements, Operators: arithmetic operators, assignment operators, comparison operators, logical operators, identity operators, membership operators, bitwise operators.</p>									COs	Course Outcome	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.	MODULE - I	INTRODUCTION TO PYTHON	Classes: 10
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MODULE - II	CONTROL STRUCTURES	Classes: 08
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	Classes: 10
Creating List, List manipulation – index (), append (), insert (), copy (), extend (), count (), remove (), pop (), reverse (), sort (), l end (), 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	Classes: 09
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 Lambda function in python		
MODULE - V	INTRODUCTION TO OOPS	Classes: 08
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.		
V. Text Books:		
1. R Nageswara Rao, “Core Python Programming”, Dreamtech Press, 2 nd Edition, 2017. 2. Dusty Philips, “Python 3 Object Oriented Programming”, PACKT Publishing, 2 nd Edition, 2015.		
VI. Reference Books:		
1. Michael H. Goldwasser, David Letcher, “Object Oriented Programming in Python”, Prentice Hall, 1 st Edition, 2007.		
VII. Web References:		
1. https://www.bfoit.org/itp/Programming.html 2. https://www.khanacademy.org/computing/computer-programming 3. https://www.edx.org/course/programming-basics-iitbombayx-cs101-1x-0 4. https://www.edx.org/course/introduction-computer-science-harvardx-cs50x		
VIII. E-Text Books:		
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/		