

UNIVERSITY OF MADRAS
B.Sc. DEGREE PROGRAMME IN COMPUTER SCIENCE
 SYLLABUS WITH EFFECT FROM 2023-2024

Year: I

Semester: I

Core-II: Python Programming Practical (Common to B.Sc.-CS with AI, CS with DS, Software Appl.& BCA)		125C11						
Credits 5	Lecture Hours:5 per week							
<p>Learning Objectives: (for teachers: what they have to do in the class/lab/field)</p> <ul style="list-style-type: none"> • Acquire programming skills in core Python. • Acquire Object-oriented programming skills in Python. • Develop the skill of designing graphical-user interfaces (GUI) in Python. • Develop the ability to write database applications in Python. • Acquire Python programming skills to move into specific branches 								
<p>Course Outcomes: (for students: To know what they are going to learn)</p> <p>CO1: To understand the problem solving approaches</p> <p>CO2: To learn the basic programming constructs in Python</p> <p>CO3: To practice various computing strategies for Python-based solutions to real world problems</p> <p>CO4: To use Python data structures - lists, tuples, dictionaries.</p> <p>CO5: To do input/output with files in Python.</p>								
List of Programs								
<ol style="list-style-type: none"> 1. Program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice. 2. Write a Python program to construct the following pattern, using a nested loop <pre style="margin-left: 40px;"> * ** *** **** ***** **** *** ** *</pre> 3. Program to calculate total marks, percentage and grade of a student. Marks obtained in each of the five subjects are to be input by user. Assign grades according to the following criteria: <table style="margin-left: 40px; width: 80%;"> <tr> <td>Grade A: Percentage ≥ 80</td> <td>Grade B: Percentage ≥ 70 and < 80</td> </tr> <tr> <td>Grade C: Percentage ≥ 60 and < 70</td> <td>Grade D: Percentage ≥ 40 and < 60</td> </tr> <tr> <td>Grade E: Percentage < 40</td> <td></td> </tr> </table> 4. Program, to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user. 5. Write a Python script that prints prime numbers less than 20. 6. Program to find factorial of the given number using recursive function. 			Grade A: Percentage ≥ 80	Grade B: Percentage ≥ 70 and < 80	Grade C: Percentage ≥ 60 and < 70	Grade D: Percentage ≥ 40 and < 60	Grade E: Percentage < 40	
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7. Write a Python program to count the number of even and odd numbers from array of N numbers.
8. Write a Python class to reverse a string word by word.
9. Given a tuple and a list as input, write a program to count the occurrences of all items of the list in the tuple. (Input: tuple = ('a', 'a', 'c', 'b', 'd'), list = ['a', 'b'], Output: 3)
10. Create a Savings Account class that behaves just like a Bank Account, but also has an interest rate and a method that increases the balance by the appropriate amount of interest (Hint: use Inheritance).
11. Read a file content and copy only the contents at odd lines into a new file.
12. Create a Turtle graphics window with specific size.
13. Write a Python program for Towers of Hanoi using recursion
14. Create a menu driven Python program with a dictionary for words and their meanings.
15. Devise a Python program to implement the Hangman Game.

Learning Resources:

Recommended Texts

1. Charles Dierbach, "Introduction to Computer Science using Python - A computational Problem-solving Focus", Wiley India Edition, 2015.
2. Wesley J. Chun, "Core Python Applications Programming", 3rd Edition , Pearson Education, 2016

Reference Books

1. Mark Lutz, "Learning Python Powerful Object Oriented Programming", O'reilly Media 2018, 5th Edition.
2. Timothy A. Budd, "Exploring Python", Tata MCGraw Hill Education Private Limited 2011, 1 st Edition.
3. John Zelle, "Python Programming: An Introduction to Computer Science", Second edition, Course Technology Cengage Learning Publications, 2013, ISBN 978- 1590282410
4. Michel Dawson, "Python Programming for Absolute Beginners", Third Edition, Course Technology Cengage Learning Publications, 2013, ISBN 978-1435455009