

**UNIVERSITY OF MADRAS**  
**BACHELOR OF COMPUTER APPLICATIONS (BCA)**  
**DEGREE PROGRAMME**  
 SYLLABUS WITH EFFECT FROM 2023-2024

**Year: I**

**Semester: I**

<b>Core-II: Python Programming Practical</b> (Common to B.Sc.-CS, CS with AI, CS with DS, Software Appl.)	<b>120C11</b>
<b>Credits 5</b>	<b>Lecture Hours:5 per week</b>
<p><b>Learning Objectives:</b> (for teachers: what they have to do in the class/lab/field)</p> <ul style="list-style-type: none"> <li>• Acquire programming skills in core Python.</li> <li>• Acquire Object-oriented programming skills in Python.</li> <li>• Develop the skill of designing graphical-user interfaces (GUI) in Python.</li> <li>• Develop the ability to write database applications in Python.</li> <li>• Acquire Python programming skills to move into specific branches</li> </ul>	
<p><b>Course Outcomes:</b> (for students: To know what they are going to learn)</p> <p><b>CO1:</b> To understand the problem solving approaches</p> <p><b>CO2:</b> To learn the basic programming constructs in Python</p> <p><b>CO3:</b> To practice various computing strategies for Python-based solutions to real world problems</p> <p><b>CO4:</b> To use Python data structures - lists, tuples, dictionaries.</p> <p><b>CO5:</b> To do input/output with files in Python.</p>	

<b>List of Programs</b>						
<ol style="list-style-type: none"> <li>1. Program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice.</li> <li>2. Write a Python program to construct the following pattern, using a nested loop       <div style="text-align: center; margin: 10px 0;"> <pre> * ** *** **** ***** **** *** ** *</pre> </div> </li> <li>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%; border: none;"> <tr> <td style="padding-right: 40px;">Grade A: Percentage <math>\geq 80</math></td> <td>Grade B: Percentage <math>\geq 70</math> and <math>&lt; 80</math></td> </tr> <tr> <td style="padding-right: 40px;">Grade C: Percentage <math>\geq 60</math> and <math>&lt; 70</math></td> <td>Grade D: Percentage <math>\geq 40</math> and <math>&lt; 60</math></td> </tr> <tr> <td style="padding-right: 40px;">Grade E: Percentage <math>&lt; 40</math></td> <td></td> </tr> </table> </li> <li>4. Program, to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.</li> <li>5. Write a Python script that prints prime numbers less than 20.</li> </ol>	Grade A: Percentage $\geq 80$	Grade B: Percentage $\geq 70$ and $< 80$	Grade C: Percentage $\geq 60$ and $< 70$	Grade D: Percentage $\geq 40$ and $< 60$	Grade E: Percentage $< 40$	
Grade A: Percentage $\geq 80$	Grade B: Percentage $\geq 70$ and $< 80$					
Grade C: Percentage $\geq 60$ and $< 70$	Grade D: Percentage $\geq 40$ and $< 60$					
Grade E: Percentage $< 40$						

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6. Program to find factorial of the given number using recursive function.
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