Course Code: BCAT 211 **L T/P C**
Course Name: Basics of Python Programming **4 0 4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. There should be10 questions of short answer type of 2.5 marks each, having at least 2 questions from each unit.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions to evaluate analytical/technical skills of candidate. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks, including its subparts, if any.
3. Examiners are requested to go through the Course Outcomes(CO) of this course and prepare the question paper accordingly, using Bloom's Taxonomy(BT), in such a way that every question be mapped to some or other CO and all the questions, put together, must be

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In this course, the learners will be able to develop expertise related to the following: -

1. To understand Python programming fundamentals
2. To define the structure and components of a Python program.
3. To apply fundamental problem-solving techniques using Python
4. To design and program applications using Python.

PRE-REQUISITES:

1. **Computer Fundamentals**

COURSE OUTCOMES(COs):

After completion of this course, the learners will be able to: -

CO#	Detailed Statement of the CO	BT Level	Mapping to PO #
CO1	Demonstrate knowledge of basic programming constructs in python.	BTL2	PO1, PO2, PO3,PO7
CO2	Illustrates string handling methods and user-defined functions in python	BTL3	PO1, PO2, PO3,PO7, PO10
CO3	Applying data structures primitives like List, Dictionary and tuples.	BTL2	PO1, PO2, PO3,PO4
CO4	Identify the commonly used operations involved in file handling	BTL3	PO1, PO2, PO3, PO4, PO7
CO5	To understand how python can be used for application development	BTL2	PO1, PO2, PO3, PO4, PO11

UNIT–I

No. of Hours: 11 Chapter/Book Reference: TB1[Chapters 1, 2], TB2[Chapters 1, 3, 6]

Basic Introduction: Origin, Need of Python Programming, Features, program structure, identifiers, reserved words, escape sequences, IDLE-Python Interpreter

Python Programming Introduction: Variables and assignment statements, data types, **Operators**: Assignment, Unary, Binary, Arithmetic, Relational, Logical, Bitwise Operator and membership operator

Control Structures: if-conditional statements, if –else condition, if-elif-else condition, nested if-elif-else condition, Iteration (for Loop and while loop), Nested Loops, break and continue statement.

Strings: Slicing, Membership, Built in functions (count, find, capitalize, title, lower, upper and swap case, replace, join, isspace (), isdigit(), split(), startswith(), endswith()).

UNIT–II

No. of Hours: 11 Chapter/Book Reference: TB1[Chapter 3], TB2[Chapters 7, 12]

Mutable and Immutable objects: List: creating, initializing, accessing, slicing, and traversing List. List operations: length, concatenation, repetition, in, not in, max, min, sum, all, any. List methods: append, extend, count, remove, index, pop, insert, sort, reverse.
Tuples: creating tuples, Tuple operations: length, concatenation, repetition, membership, maximum, minimum, tuple methods: count, index.
Dictionary: creating, accessing values, adding, modifying and deleting items in dictionary, Dictionary methods: len, str, clear, copy, get, update, copy. Difference between list and dictionary

UNIT–III

No. of Hours: 11 Chapter/Book Reference: TB1 [Chapters 5], TB2[Chapters 2, 8]

Concept of Functions: Functions: Defining, Calling and Types of Functions, Arguments and Return Values, Formal vs. Actual Arguments, Scope and Lifetime, Keyword Arguments, Default Arguments, Recursion.
Modules: importing Modules, Math and Random Module, creating your own modules, and concept of Packages

UNIT–IV

No. of Hours: 11 Chapter/Book Reference: TB2[Chapter 9], TB1[Chapters 5, 7]

NumPy Library: introduction to NumPy, Creation of One-Dimensional Arrays, Re-shaping of an Array, Element-wise Operations, Aggregate Operations, Array indexing, Array Slicing, insert Row/Columns, Append Row/Columns, Array Manipulation Operations.
Introduction to matplotlib: Bar Graphs , pie charts
File handling: Types of Files (Text file, Binary Files, CSV file), Creation, writing, appending, Insertion, deletion, updating, modification of Data in into the files.

TEXTBOOKS:

TB1. Programming in Python 3: A Complete Introduction to the Python Language (2nd Edition), Mark Summerfield.
TB2. Python Programming: A Modular Approach by TanejaSheetal, Kumar Naveen, Eleventh Impression, Pearson India Education Services Pvt. Ltd.
TB3. Agile tools for real world data: Python for Data Analysis by Wes McKinney, O'Reilly

REFERENCE BOOKS:

RB1. Let Us Python 2Nd Ed: Python Is Future, Embrace It Fast (Second Edition): YashvantKanetkar.
RB2. Programming Python, 4th Edition by Mark Lutz Released December 2010 Publisher(s): O'Reilly Media, Inc.
RB3. Python: The Complete Reference by Martin Brown.

Course Code: BCAP 211 **L P C**
Course Name: Basics of Python Programming **0 2 1**

This is the associated practical paper. The learning outcomes are same as the corresponding theory paper.

List of Practicals

S.No.	Problem Statement	Mapping to CO #
Implement Minimum 10 out of 15 Practicals		
1	Write a program to enter two integers, two floating numbers and then perform all arithmetic operations on them.	CO1
2	Write a program to check whether a number is an Armstrong number or not.	CO1
3	Write a program to print the sum of all the primes between two ranges.	CO1
4	Write a program to swap two strings.	CO1
5	Write a menu driven program to accept two strings from the user and perform the various functions using user defined functions.	CO1, CO2
6	Write a program to find smallest and largest number in a list	CO2, CO3
7	Create a dictionary whose keys are month names and whose values are the number of days in the corresponding months. • Ask the user to enter a month name and use the dictionary to tell them how many days are in the month. • Print out all keys in the alphabetically order • Print out all the months with 31 days	CO2, CO3

	• Print out the key value pairs sorted by number of days in each month	
8	Make a list of first 10 letters of the alphabet, then use the slicing to do the following operations: • Print the first 3 letters of the list • Print any 3 letters from the middle Print the letter from any particular index to the end of the list	CO2, CO3
9	Write a program that scans an email address and forms a tuple of user name and domain.	CO2, CO3
10	Write a program that uses a user defined function that accepts name and gender (as M for Male, F for Female) and prefixes Mr./Ms. on the basis of the gender.	CO2, CO3
11	Write a program to display Bar graphs or Pie chart using Matplotlib.	CO2, CO3
12	Write a program that defines a function large in a module which will be used to find larger of two values and called from code in another module	CO2, CO3
13	Write a program to know the cursor position and print the text according to specifications given below: ● Print the initial position ● Move the cursor to 4th position ● Display next 5 characters ● Move the cursor to the next 10 characters ● Print the current cursor position ● Print next 10 characters from the current cursor position	CO2, CO3
14	Create a binary file with roll number, name and marks. Input a roll number and perform the following operations: • update the marks. • Delete the record • Display the record • Append the record • Search the record	CO4
15	Write a program to Create a CSV file by entering user-id and password, read and search the password for given user id	CO5
Note: 1. In total 10 practicals to be implemented. **2. This is a suggestive list of practicals. However, the instructor may add or change any other database for executing queries as per the requirement.**		