PYTHON PROGRAMMING **Course Code : 314004**

Sr.No	Theory Learning Outcomes (TLO's)aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
5	TLO 5.1 Write python program to use pandas package for the given problem. TLO 5.2 Create GUI application using tkinter package for the given problem. TLO 5.3 Create a python application to connect with database.	**Unit - V Introduction to Built-in Packages in Python** 5.1 Pandas: Use of pandas, pandas series, pandas DataFrames, pandas Read CSV 5.2 Creating GUI using tkinter: Introduction to tkinter, Widgets (Entry, Label, Button, RadioButton, Checkbutton), Creating a simple GUI application 5.3 Connecting to Database using MySQL: Installing mysql-connector, cursor() object, execute() method, fetchall() method, Creating simple program to connect database	Lecture Using Chalk-Board Flipped Classroom Demonstration Presentations

VI. LABORATORY LEARNING OUTCOME AND ALIGNED PRACTICAL / TUTORIAL EXPERIENCES.

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 1.1 Install the given Python IDE.	1	Install given Python IDE.	2	CO1
LLO 2.1 Write python program for performing basic input and output operation in given problem.	2	*1. Write python program to display welcome message on screen. 2. Implement the python program to read data from user and display data on screen.	2	CO1
LLO 3.1 Write python program to solve given expression.	3	*Implement a python programs using following operators: 1. Arithmetic 2. Relational & logical 3. Assignment 4. Bitwise 5. Membership 6. Identity	2	CO1
LLO 4.1 Write python program for solving given problem using various if statements.	4	*Implement a python program to demonstrate the use of following conditional statements: 1. if statement 2. if..else statement 3. if..elif..else statement 4. nested if statement	2	CO1
LLO 5.1 Write python program for solving given problems using a while loop. LLO 5.2 Write python program for solving given problem using for loop.	5	*Implement a python program to demonstrate the use of following looping statements: 1. while loop 2. for loop 3. nested loop	2	CO1
LLO 6.1 Use loop control statements in python for solving given problem.	6	Implement python program to demonstrate the use of loop control statements. [continue, pass, break, else]	2	CO1

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LLO 7.1 Write python program to perform operations on list.	7	*Implement a python program to perform following operations on the List: 1. Create a List 2. Access List 3. Update List 4. Delete List	2	CO2
LLO 8.1 Write python program to use built-in functions on list.	8	Implement Python program to demonstrate the use of built-in functions/methods on List (Any Eight Functions/methods)	2	CO2
LLO 9.1 Write python program to perform operations on tuple.	9	*Implement python program to perform following operations on the Tuple: 1. Create a Tuple 2. Access Tuple 3. Print Tuple 4. Delete Tuple 5. Convert tuple into list and vice-versa	2	CO2
LLO 10.1 Write python program to manipulate the set.	10	*Implement a python program to perform following operations on the Set: 1. Create a Set 2. Access Set 3. Update Set 4. Delete Set	2	CO2
LLO 11.1 Use built-in functions/methods on sets in python for solving given problems.	11	Implement a python program to perform following functions on Set: 1. Union 2. Intersection 3. Difference 4. Symmetric Difference	2	CO2
LLO 12.1 Write python program to perform operations on dictionary.	12	*Implement a python program to perform following operations on the Dictionary: 1. Create a Dictionary 2. Access Dictionary 3. Update Dictionary 4. Delete Dictionary 5. Looping through Dictionary 6. Create Dictionary from list	2	CO2
LLO 13.1 Write function to solve given problem.	13	Write a user define function to implement following features: 1. Function without argument 2. Function with argument 3. Function returning value	2	CO3
LLO 14.1 Write python program to create function by selecting appropriate type of argument.	14	*Implement user defined function for given problem: 1. Function positional/required argument 2. Function with keyword argument 3. Function with default argument 4. Function with variable length argument	2	CO3

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Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 15.1 Write python program using anonymous function. LLO 15.2 Write python program to use function in argument.	15	Write Python program to demonstrate use of following advanced functions: 1. lambda 2. map 3. reduce	2	CO3
LLO 16.1 Write user defined module to solve given problem.	16	Write a python program to create and use a user defined module for a given problem.	2	CO3
LLO 17.1 Select appropriate module to solve given problem. LLO 17.2 Use given module to solve problem.	17	Write a python program to demonstrate the use of following module: 1. math module 2. random module 3. os module	2	CO3
LLO 18.1 Write user defined package to solve given problem.	18	*Write python program to create and use a user defined package for a given problem.	2	CO3
LLO 19.1 Use numpy and matplotlib package to solve given problem. LLO 19.2 Select appropriate methods from numpy and matplotlib package to solve given problem.	19	Write a python program to use of numpy package to perform operation on 2D matrix. Write a python program to use of matplotlib package to represent data in graphical form.	2	CO4
LLO 20.1 Write python program using classes and objects to solve a given problem.	20	*Develop a python program to perform following operations: 1. Creating a Class with method 2. Creating Objects of class 3. Accessing method using object	2	CO4
LLO 21.1 Write a python program to initialize objects of class using various types of constructors.	21	*Write a python program to demonstrate the use of constructors: 1. Default 2. Parameterized 3. Constructor Overloading	2	CO4
LLO 22.1 Write a python program to implement polymorphism.	22	*Implement a python program to demonstrate 1. Method Overloading 2. Method Overriding	2	CO4
LLO 23.1 Write a python program to use data hiding concept in python.	23	Write python program to demonstrate data hiding.	2	CO4
LLO 24.1 Select appropriate type of inheritance to solve given problem. LLO 24.2 Write python program using inheritance to solve given problem.	24	*Write a python program to implement 1. Single inheritance 2. Multiple Inheritance 3. Multilevel inheritance	2	CO4
LLO 25.1 Use panda package and its appropriate functions/methods to solve a given problem.	25	*Implement Python program to perform following operations using panda package: 1. Create Series from Array 2. Create Series from List 3. Access element of series 4. Create DataFrame using List or dictionary	2	CO5
LLO 26.1 Write python program to read CSV file using the panda package.	26	Implement python program to load a CSV file into a Pandas DataFrame and perform operations.	2	CO5

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Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 27.1 Use appropriate packages in a python program to create GUI applications.	27	*Write python GUI program to import Tkinter package and create a window and set its title.	2	CO5
LLO 28.1 Write python program to create GUI based python applications using appropriate python packages.	28	Write python GUI program that adds labels and buttons to the Tkinter window.	2	CO5
LLO 29.1 Write python program to connect database.	29	Write program to create a connection between database and python.	2	CO5
LLO 30.1 Write python program to display the content from database.	30	Implement python program to select records from the database table and display the result.	2	CO5

Note : Out of above suggestive LLOs -

- '*' Marked Practicals (LLOs) Are mandatory.
- Minimum 80% of above list of lab experiment are to be performed.
- Judicial mix of LLOs are to be performed to achieve desired outcomes.

VII. SUGGESTED MICRO PROJECT / ASSIGNMENT/ ACTIVITIES FOR SPECIFIC LEARNING / SKILLS DEVELOPMENT (SELF LEARNING)

Activities

- Students are encouraged to use online tools to improve their learning, such as the e-Kumbh from AICTE and the Virtual Labs from IIT.
- Students should be encouraged to participate in various coding competitions, such as hackathons, online coding contests on websites like hackerrank, Codechef etc.
- At the institution level, encourage students to start a coding club.

Self Learning

- Students are encouraged to register themselves in various MOOC's such as Infosys Springboard, Swayam etc. to further enhance their learning.

Note :

- Above is just a suggestive list of microprojects and assignments; faculty must prepare their own bank of microprojects, assignments, and activities in a similar way.
- The faculty must allocate judicial mix of tasks, considering the weaknesses and / strengths of the student in acquiring the desired skills.
- If a microproject is assigned, it is expected to be completed as a group activity.
- SLA marks shall be awarded as per the continuous assessment record.
- For courses with no SLA component the list of suggestive microprojects / assignments/ activities are optional, faculty may encourage students to perform these tasks for enhanced learning experiences.
- If the course does not have associated SLA component, above suggestive listings is applicable to Tutorials and maybe considered for FA-PR evaluations.

VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number