| | |
|---|---|
| and Object. Defining variables and functions inside class. Creating objects, Inheritance, Multiple and Multi Level Inheritance, Function over-riding, the concept of composing objects of a different class in an object, problems on object composition.<br><br>GUI creation in Python: GUI creation using Python's GUI package like tkinter. Creating labels, buttons, entry (textbox), combobox, checkbutton, radiobutton, scrolledText (textarea), spinbox, progressbar, menubar, filedialog, tabs etc. | |
| **Unit – V**<br><br>Data visualization in Python: Scatter plot, Line plot, Bar plot, Histogram, Box plot, Pair plot.<br><br>Case study on Regression, Classification, Clustering using Data Science algorithm on real life datasets. | **8** |

**Course Outcomes**

Upon successful completion of this course, candidates will be able to:

- To implement Python code to solve simple to moderately complex problems.
- To develop strong problem-solving skills by identifying issues, devising algorithms, and implementing solutions in Python.
- To work with various data structures in Python, including lists, tuples, dictionaries, and sets.
- To understand the principles of object-oriented programming in python including classes, objects, inheritance, encapsulation, and polymorphism.
- To create Graphical User Interface (GUI) in Python.

**Text Books/ Reference books**


1. Paul Deitel and Harvey Deitel, "Python for Programmers", Pearson Education, 1st Edition, 2021.
2. Allen B. Downey, "Think Python : How to Think like a Computer Scientist", 2nd Edition, O'Reilly Publishers, 2016.
3. Karl Beecher, "Computational Thinking: A Beginner's Guide to Problem Solving and Programming", 1st Edition, BCS Learning & Development Limited, 2017.

# Central University of Jammu

Rahya-Suchani (Bagla) District Samba – 181143, Jammu (J&K)

## Department of Electronics and Communication Engineering


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# Python Programming Lab

**Course Code:** BEECA2C002P

**Course Title:** Python Programming Lab

**Semester:** III

**Credits:** 02

### Rationale

Students will be able to learn and practice basic python programming. Students can expand their skillset by learning and solving basic problems in python. Python is very easy to use, powerful, and versatile. It has become the language of choice for many developers. Python is easy for beginners to learn and widely utilized in many scientific areas.

### List of practical

1. Programs using simple statements and expressions.
2. Programs using Conditionals and Iterative loops. (Number series, Number Patterns, pyramid pattern)
3. Programs using inbuilt math Functions.
4. Programs on String manipulations: subscript operator, indexing, slicing a string etc.
5. Program to demonstrate use of List in Python with their inbuilt functions.
6. Program to demonstrate use of Dictionary in Python with their inbuilt functions.
7. Program to demonstrate use of Set in Python with their inbuilt functions.
8. Program to demonstrate use of Tuple in Python with their inbuilt functions.
9. Program to read files and perform exploratory analysis on data using Pandas module.
10. Programs on basic operations on array and matrices using Numpy module.
11. Programs on data visualization using Matplotlib module for Scatter plot, Line plot, Bar plot, Histogram, Box plot, Pair plot.
12. Programs on File Handling for reading, writing and appending text files .
13. Programs on Exception Handling using try, catch block.
14. Programs on classes and objects.
15. Programs on inheritance.
16. Programs on polymorphism
17. Program to make a GUI to take input from user, perform operations and display.
18. Programs on regression using data science algorithms on real life dataset.
19. Programs on classification using data science algorithms on real life dataset.
20. Programs on clustering using data science algorithms on real life dataset.

### Course Outcomes

Upon successful completion of this course, candidates will be able to:

- Develop algorithmic solutions to simple computational and business problems
- Develop and execute simple Python programs.

- Implement programs in Python using conditionals and loops for solving problems.
- Deploy functions to decompose a Python program.
- Process compound data using Python data structures.
- Apply object oriented features in developing programs to solve real world problems.
- Utilize Python packages in developing software applications.
- Develop simple GUI interfaces and to understand the event-based GUI handling principles in python.

**Text Books/ Reference books**


4. Paul Deitel and Harvey Deitel, "Python for Programmers", Pearson Education, 1st Edition, 2021.
5. Allen B. Downey, "Think Python : How to Think like a Computer Scientist", 2nd Edition, O'Reilly Publishers, 2016.
6. Karl Beecher, "Computational Thinking: A Beginner's Guide to Problem Solving and Programming", 1st Edition, BCS Learning & Development Limited, 2017.