**FR. Conceicao Rodrigues College Of Engineering**

Father Agnel Ashram, Bandstand, Bandra-west, Mumbai-50

**Department of Production Engineering**

**S.E. (PROD) (semester III)  (2020-2021)**

**Practical Plan:**

 **Subject: R Programming Lab (PEL302)                                          Credits-1**

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**Lab Objectives:**

The course will help the students to get familiar with:

1. Basics of Python programming.
2. Decision Making and Functions in Python.
3. Object Oriented Programming, using Python.
4. Files Handling in Python.
5. GUI Programming and Databases operations in Python.
6. Network Programming in Python.

**Lab Outcomes:** Learner will be able to:

1. Describe the Numbers, Math functions, Strings, List, Tuples and Dictionaries in Python.
2. Express different Decision Making statements and Functions.
3. Interpret Object oriented programming in Python.
4. Understand and summarize different File handling operations.
5. Explain how to design GUI Applications in Python and evaluate different database operations.
6. Design and develop Client Server network applications using Python.

**DETAILED SYLLABUS:**

|  |  |  |
| --- | --- | --- |
| Module | Detailed Content | LO mapping |
| 01 | Write python programs to understand Expressions, Variables, Quotes, Basic Math operations, Strings: Basic String Operations & String Methods, List, Tuples, Dictionaries, Arrays.  (Minimum Three Programs based on math operations, Strings and List/Tuples/ Dictionaries). | LO1 |
| 02 | Write python programs to understand different decision making statements and Functions.  (Minimum Three Programs based on Decision making, Looping Statements and Functions). | LO2 |
| 03 | Write python programs to understand different Object oriented features in Python (Minimum four programs based on a) Classes & objects, b) Constructors, c) Inheritance & Polymorphism and d) Exception handling). | LO3 |
| 04 | Write python programs to understand different File handling operations. | LO4 |
| 05 | Write python programs to understand GUI designing and database operations.  (Minimum Three programs based on GUI designing using Tkinter, Mysql database creation & Database connectivity with DML operations using python. | LO5 |
| 06 | Write python programs to understand TCP and UDP Sockets in Python  (Minimum One programs based on TCP or UDP Sockets). | LO6 |

**Assessment:**

**Term Work:**

Distribution of Term work Marks

Laboratory work ……….20 Marks

Attendance ………..05 Marks

**Reference Books:**

1. Wesley J Chun,” Core Python Applications Programming”, Third Edition, Pearson Publication.

2. E. Balguruswamy,” Introduction to Computing and Problem Solving using Python”, McGraw Hill Publication.

3. Learn to Master Python, from Star EDU solutions, by Script Demics.

4. James Payne,”Beginning Python: Using Python 2.6 and Python 3.1”,Wrox Publication.

5. Dr. R. Nageswara Rao,”Core Python Programming”, Dreamtech Press, Wiley Publication.

6. Magnus Lie Hetland,”Beginning Python From Novice to Professional”, Second Edition”, Apress Publication.

**Lab Outcome Statement**

|  |  |
| --- | --- |
| Sr.No. | Lab Outcome Statement |
| LO1 | Describe the Numbers, Math functions, Strings, List, Tuples and Dictionaries in Python. |
| LO2 | Express different Decision Making statements and Functions. |
| LO3 | Interpret Object oriented programming in Python. |
| LO4 | Understand and summarize different File handling operations. |
| LO5 | Explain how to design GUI Applications in Python and evaluate different database operations. |
| LO6 | Design and develop Client Server network applications using Python. |

**LO-PO and LO-PSO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Name** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
| LO1 | 3 |  |  |  |  |  |  |  |  |  |  |  | 1 |  |
| LO2 | 3 |  |  | 1 |  |  |  |  |  |  |  |  | 1 |  |
| LO3 | 2 | 2 |  |  |  |  |  |  |  |  |  |  | 1 |  |
| LO4 | 3 |  |  |  |  |  |  |  |  |  |  |  | 1 |  |
| LO5 | 2 | 2 | 2 | 2 |  |  |  |  |  |  |  |  | 1 |  |
| LO6 | 2 | 2 | 2 | 2 |  |  |  |  |  |  |  |  | 1 |  |

**LO Assessment Tools**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Expt 1 | Expt 2 | Expt 3 | Expt 4 | Expt 5 | Expt 6 | Expt 7 | Expt 8 | Expt 9 | Expt 10 | Assignment |
| LO1 | 50% | 50% | 50% | 50% |  |  |  |  |  |  |  |
| LO2 | 50% | 50% | 50% | 50% |  |  |  |  |  |  |  |
| LO3 |  |  |  |  |  | 100% | 100% | 100% | 100% |  |  |
| LO4 |  |  |  |  | 100% |  |  |  |  |  |  |
| LO5 |  |  |  |  |  |  |  |  |  | 100% | 50% |
| LO6 |  |  |  |  |  |  |  |  |  |  | 50% |

**Time Table :**

Friday 11.30-12.30 (1 hour lecture).

**Date wise Lecture Plan :**

|  |  |  |  |
| --- | --- | --- | --- |
| Sr. No. | Topics | Planned Date | Actual Date |
|  | Introduction to Python, installation, variables, data types, running of the program, Numbers in Python, Number formats, String Quotes, print(),input() | 17/7/20 | 17/7/20 |
| 2. | Boolean data types, arithmetic, logical, comparison operator, list, if else statement | 24/7/20 | 24/7/20 |
| 3. | While loop, basic programs in python | 31/7/20 | 31/7/20 |
| 4. | For loop, basic programs in python | 7/8/20 | 7/8/20 |
| 5. | Tuples ( syntax, built in methods, concepts, functions) Operations on Tuples, Tuple methods,  Lists Changeable Sequences of Data, Operations on List, List methods, Introduction to dictionary | 14/8/20 | 14/8/20 |
| 6. | SET data structure(definition, methods, accessing items, Union, intersection, difference) | 21/8/20 | 21/8/20 |
| 7 | Dictionary in python — Groupings of Data Indexed by Name, Operations on Dictionaries, Dictionary methods, Special String Substitution Using Dictionaries , String, Operations on string, string methods, Treating a String Like a List, using coding examples. | 28//9/20 | 4/9/20 |
| 8 | Function in python: user defined functions, types of arguments, return statement, using coding examples | 4/9/20 | 11/9/20 |
| 9 | Function in python Built-in functions, modules like math, calendar, time, datetime, user defined modules, lambda function | 11/9/20 | 18/9/20 |
| 10 | Recursion in python, File handling operations, Types of Files in Python, Opening a File, Closing a File. Writing Text Files, Knowing Whether a File Exists or Not, Working with Binary Files, Appending Text to a File, Reading Text Files, File Exceptions, | 18/9/20 | 9/10/20 |
| 11 | Exceptions Handling: Errors in a Python Program, Exceptions, Exception Handling, Types of Exceptions, The Except Block, The assert Statement. | 9/10/20 | 16/10/20 |
| 12 | Creating a Class, Self Variables, Constructors, Types of Methods, Inner Classes. OOP concepts , Constructors in Inheritance, Polymorphism | 16/10/20 | 23/10/20 |
| 13 | Classes Operator Overloading, Method Overloading & Overriding, Interfaces in Python. | 23/10/20 | 6/11/20 |
| 14 | GUI Programming - Writing a GUI with Python: GUI Programming Toolkits, Creating GUI Widgets with Tkinter | 6/11/20 | 13/11/20 |

**Material Provided to students :**

1. All lectures ppt and video link
2. Tutorial notes on python
3. Python e-books

**Rubrics for assessment of Experiment:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sr. No.** | **Indicator** | **Poor** | **Average** | **Good** |
| 1. | Timeline  Maintains submission deadline (3) | Submission not done (0) | One or More than One week late (1-2) | Maintains deadline (3) |
| 2. | Completion and Organization (3) | NA | Document is just acceptable but no conclusion or post lab(1 or 2) | Completed whole document and neatly organized (3) |
| 3. | Program Performance (2) | Copied it from someone else(0) | tried to complete (1) | Tried and get succeeded in completion (2) |
| 4. | Knowledge  In depth knowledge of the Experiment(2) | Unable to answer questions(0) | Unable to answer few questions (1) | Able to answer all questions (2) |

**Rubrics for assessment of Assignment:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Indicator** | **Poor** | **Average** | **Good** |
| Timeline  Maintains submission deadline (3) | Submission not done (0) | One or More than One week late (1-2) | Maintains deadline (3) |
| Completeness(3) | Not able to solve any problem(0) | Not able to solve few problem(1 or 2) | Able to solve all the problems(3) |
| Accuracy(4) | No output(0) | Partial output or program works for very few test cases(1) | Correct output. Program works for all test cases(4) |