FR. Conceicao Rodrigues College Of Engineering

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

Department of Information technology

S.E. (I.T.) (semester IV) (2018-2019)

Lecture Plan:

Subject: Python Lab (ITL404)

Course Code	Course Name	Theory	Practical	Tutorial	Theory	TW/Practical	Tutorial	Total
ITL404	Python lab	--	2+2*	--	--	02	--	02

Course Code	Course Name	Examination Scheme						
		Theory Marks				Term Work	Oral & Practical	Total
		Internal assessment			End Sem. Exam			
		Test1	Test 2	Avg. of two Tests				
ITL404	Python lab	--	--	--	--	50	50	100

*2 hours shown as practical's to be taken class wise lecture and other 2 hours to be taken as batch wise practicals in Lab.

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: Upon Completion of the course the learner should 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

Hardware & Software Requirements:

Prerequisite Subjects: Structured Programming Approach & Java Programming

Detailed Syllabus:

Sr. No.	Module	Detailed Content	Hours	LO Mapping
0	Prerequisite	Basic Programming syntax of Java/C. Installation and configuration of python.	02	
I	Basics of Python	**Theory**: Numbers in Python, Basic & Built-in Math functions, Number Formats, Strings, Quotes, print() Function, Assigning Values to Names & Changing Data Through Names, Copying Data, Tuples — Unchanging Sequences of Data, Lists — Changeable Sequences of Data, Dictionaries — Groupings of Data Indexed by Name, Special String Substitution Using Dictionaries , Arrays, Treating a String Like a List, Special Types, Ranges of Sequences, Working with Sets, Arrays. **Lab Experiment:** 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)	10	LO 1
II	Decision Making and Functions	**Theory:** If statement, if-elif-else, Repetition using while loop, for loop, break statement, Handling Errors- try: statement, except: statement, Functions-Grouping Code under a Name, defining a Function, describing a	10	LO 2

		function in the function, Checking & Setting Your Parameters, Calling Functions from within Other Functions, Functions Inside of Functions, Layers of Functions **Lab Experiment:** Write python programs to understand different decision making statements and Functions. (Minimum Three Programs based on Decision making, Looping Statements and Functions)		
III	Object Oriented Programming using Python programming	**Theory:** Creating a Class, Self Variables, Constructors, Types of Methods, Inner Classes, Constructors in Inheritance, Polymorphism,, The super() Method, Method Resolution Order (MRO), Operator Overloading, Method Overloading & Overriding, Interfaces in Python. Exceptions Handling: Errors in a Python Program, Exceptions, Exception Handling, Types of Exceptions, The Except Block, The assert Statement. Modules and Packages: Creating Modules and Packages, Documenting & Viewing Module, Basics of Testing Your Modules and Packages, Importing & exporting Modules. **Lab Experiment:** Write python programs to understand different Object oriented features in Python (Minimum four programs based on a) Classes & objects,	10	LO 3

		b) Constructors, c) Inheritance & Polymorphism, d) Exception handling		
IV	Files Handling	**Theory:** 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, The with Statement Pickle in Python, Lambda and Filter, Map & range functions. **Lab Experiment:** Write python programs to understand different File handling operations	07	LO 4
V	GUI Programming and Databases	**Theory:** GUI Programming - Writing a GUI with Python: GUI Programming Toolkits, Creating GUI Widgets with Tkinter, Creating Layouts, Radio Buttons and Checkboxes, Dialog Boxes. Database Access - Python's Database Connectivity, Types of Databases Used with Python, Mysql database Connectivity with Python, Performing Insert, Deleting & Update operations on database **Lab Experiment:** 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	07	LO 5

		operations using python		
VI	Web Programming	**Theory:** Understanding Protocols, Introduction to Sockets, TCP/IP Server, TCP/IP Client, UDP Server, UDP Client, File Server, File Client, Two-Way Communication between Server and Client, Multithreaded Client-Server Chat Application **Lab Experiment:** Write python programs to understand TCP and UDP Sockets in Python (Minimum One programs based on TCP or UDP Sockets)	06	LO 6

Text Books:

1. James Payne, "Beginning Python: Using Python 2.6 and Python 3.1",Wrox Publication
2. Dr. R. Nageswara Rao,"Core Python Programming" , Dreamtech Press, Wiley Publication.
3. Magnus Lie Hetland,"Beginning Python From Novice to Professional", Second Edition", Apress Publication.

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 ScriptDemics

Term Work:
Term Work shall consist of at least 12 to 15 practical's based on the above list. Also Term work Journal must include at least 2 assignments.
Term Work Marks: 50 Marks (Total marks) = 40 Marks (Experiment) + 5 Marks (Assignments) + 5 Marks (Attendance)

Oral & Practical Exam: An Oral & Practical exam will be held based on the above syllabus.

Lab Outcomes

Upon Completion of the course the learner should 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

CO-PO and CO-PSO Mapping

Course Name	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PO11**	**PO12**	**PSO 1**	**PSO 2**
LO1	3													
LO2	3			1										
LO3	2	2												
LO4	3													
LO5	2	2	2	2									1	
LO6	2	2	2	2									1	

LO Assessment Tools:

Direct Methods								Indirect Methods
	Mid Term Practical Exam(Mock1)	Assig1	Lab Work	End Sem Practical Exam(Mock 2)	Assig2	Tutorial 1	University Theory Result	Course Exit Survey
CO1	10%	20%				20%	50%	100%
CO2	10%	20%				20%	50%	100%
CO3			20%	30%			50%	100%
CO4			20%	30%			50%	100%
CO5				20%	30%		50%	100%
CO6				20%	30%		50%	100%

Curriculum Gap / Content Beyond Syllabus

1. Using NumPy, mathematical and logical operations on arrays
2. Building a web app with Python using a micro-framework called Flask.

Lecture Plan

No of classes available:	**22**	**No of Classes taken:**		
Sr. No.	**Topic Planned**	**Planned Date**	**Actual Date**	**Delivery Mechanisms**
1	Introduction to Lab Outcomes, Rubrics for evaluation of Experiments and Assignments. Introduction to Python, Features of python etc. Numbers in Python, Number formats, String Quotes, print(),input() function, Assigning values to names and changing data through names, copying data, Introduction to List, Tuple	3/1/19	3/1/19	Demonstration using projector
2	Tuples — Unchanging Sequences of Data, Operations on Tuples, Tuple methods, Lists Changeable Sequences of Data, Operations on List, List methods, Introduction to dictionary	7/1/19	4/1/19	Demonstration using projector
3	Dictionaries — 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.	10/1/19	10/1/19	Demonstration using projector
4	Range() function- Ranges of Sequences, Working with Sets, operations on set, set methods, Arrays, Control structures-for loop, while loop, if, if-else, if-elif-else with coding examples	15/1/19	11/1/19	Demonstration using projector
5	Functions: user defined functions, types of arguments, return statement, using coding examples	17/1/19	15/1/19	Demonstration using projector
6	Built-in functions, modules like math, calendar, time, datetime, user defined modules, lambda function	22/1/19	17/1/19	Demonstration using projector
7.	Handling Errors- try: statement, except: statement,	24/1/19	22/1/19	Demonstration using projector
8.	Creating a Class, Self Variables, Constructors, Types of Methods, Inner Classes.	29/1/19	24/1/19	Demonstration using projector

9	, Constructors in Inheritance, Polymorphism,, The super() Method, Method Resolution Order (MRO),	7/2/19	29/1/19	Demonstration using projector
10	Classes Operator Overloading, Method Overloading & Overriding, Interfaces in Python.	12/2/19	7/2/19	Demonstration using projector
11	Exceptions Handling: Errors in a Python Program, Exceptions, Exception Handling, Types of Exceptions, The Except Block, The assert Statement.	21/2/19	12/2/19	Demonstration using projector
12	Modules and Packages: Creating Modules and Packages, Documenting & Viewing Module, Basics of Testing Your Modules and Packages, Importing & exporting Modules	26/2/19	21/2/19	Demonstration using projector
13	Types of Files in Python, Opening a File, Closing a File. Writing Text Files, Knowing Whether a File Exists or Not,	28/2/19	26/2/19	Demonstration using projector
14	Guest Lecture- Python Hands on Training of Basics, Data Structures etc.	5/3/18	1/3/19	Demonstration using projector
15	Guest Lecture- Using NumPy, mathematical and logical operations on arrays, SciPy etc	7/3/18	1/3/19	Demonstration using projector
16	Guest Lecture- Building a web app with Python using a micro-framework called Flask, Json with Python etc.	12/3/18	1/3/19	Demonstration using projector
17	Working with Binary Files, Appending Text to a File, Reading Text Files, File Exceptions, The with Statement Pickle in Python, Lambda and Filter, Map & range functions.	14/3/18	5/3/19	Demonstration using projector
18	GUI Programming - Writing a GUI with Python: GUI Programming Toolkits, Creating GUI Widgets with Tkinter, Creating Layouts, Radio Buttons and Checkboxes, Dialog Boxes.	19/3/18	7/3/19	Demonstration using projector
19	Database Access - Python's Database Connectivity, Types of Databases Used with Python, Mysql database Connectivity with Python, Performing Insert, Deleting & Update operations on database	26/3/18	12/3/19	Demonstration using projector
20	Understanding Protocols, Introduction to Sockets, TCP/IP Server, TCP/IP Client,	28/3/18	14/3/19	Demonstration using projector

21	UDP Server, UDP Client, File Server, File Client,	2/4/18	19/3/19	Demonstration using projector
22	Two-Way Communication between Server and Client, Multithreaded Client-Server Chat Application	4/4/18	26/3/19	Demonstration using projector

Assignment Plan:

Sr. No.	Assignment	Date	Mapping to LO
1.	**Assignment No. 1**	**22/2/19**	**LO1, LO2**
2.	**Assignment No. 2**	**2/4/19**	**LO5, LO6**