Course Description

Title of Course: Advance Programming Lab-I Course Code: 18B17CI373

**L-T-P scheme: 0-0-2**  **Course Credits: 2**

**Prerequisite:** No explicit prerequisite course work is required, but students are expected to have a fundamental understanding of basic computer principles and previous experience using a personal computer.

## Objective: To emphasize object-oriented programming concepts and the design of algorithms and related data structures. Problem decomposition and principles of software engineering are stressed throughout the course. Advance aspects of programming may be taken care off through Python.

**Learning Outcomes:**

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| **Course Outcome** | | **Description** | | |
| CO1 | | Installation and understanding features of Python. | | |
| CO2 | | Describe Python data types to handle programming problems | | |
| CO3 | | Develop understanding looping to handle new data types | | |
| CO4 | | Identify appropriate methods to solve challenging problems. | | |
| CO5 | | Apply programming knowledge to solve real world problems in the form of Project | | |

**Course Contents:**

**An Introduction to Python:** Introductory Remarks about Python, Strengths and Weaknesses, A Brief History of Python, Python Versions, Installing Python, Environment Variables, Executing Python from the Command Line, IDLE, Editing Python Files, Getting Help, Dynamic Types, Python Reserved Words, Naming Conventions.

**Basic Python Syntax:** Introduction, Basic Syntax, Comments, String Values, String Operations, The format Method, String Slices, String Operators, Numeric Data Types, Conversions, Simple Input and Output, The print Function.

**Language Components:** Introduction, Control Flow and Syntax, Indenting, The if Statement, Relational Operators, Logical Operators, True or False, Bit Wise Operators, The while Loop, break and continue, The for Loop.

**Collections:** Introduction, Lists, Tuples, Sets, Dictionaries, Sorting Dictionaries, Copying Collections, Summary.

**Functions:** Introduction, Defining Your Own Functions, Parameters, Function Documentation, Keyword and Optional Parameters, Passing Collections to a Function, Variable Number of Arguments, Scope Functions- “First Class Citizens”, Passing Functions to a Function, Mapping Functions in a Dictionary, Lambda, Closures.

**Exceptions:** Errors, Run Time Errors, The Exception Model, Exception Hierarchy, Handling Multiple, Exceptions, raise, assert, Writing Your Own Exception Classes.

**Classes in Python:** Classes in Python, Principles of Object Orientation, Creating Classes, Instance Methods, File Organization, Special Methods, Class Variables, Inheritance, Polymorphism, Type Identification, Custom Exception Classes, Class Documentation-pydoc.

**GUI in Python:** Introduction, Base window, Widgets, Functions, Lambda Functions, Geometry manager, Sqlite3 Backend Connectivity, Handling images.

**Project:** Based on Learning in this course with database connectivity.

**Text Book**

1. Programming Python /Mark Lutz.

**Reference Books**

1. Think Python / Allen B Downey
2. Python 101 / Dave Kuhlman

**Evaluation scheme:**

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| **Exams** | | **Marks** | **Coverage** |
| P-1 | | 15 Marks | **Based on Lab Exercises: 1-7** |
| P-2 | | 15 Marks | **Based on Lab Exercises: 8-14** |
| **Day-to-Day Work** | Viva | 20 Marks | **70 Marks** |
| Demonstration | 20 Marks |
| Lab Record | 15 Marks |
| Attendance & Discipline | 15 Marks |
| **Total** | | **100 Marks** | |