| **Course Code** | **Course Name** | **Course Type** | **Cd** | **L** | **T** | **P** | **Marks** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Sessional** | **Final Exam** | **Total** |
| COM-303 | Python Programming | PCC | 4 | 3 | 1 | 0 | 50 | 100 | 150 |

**Course Outcomes:**

| At the end of the course the student will be able to: | |
| --- | --- |
| CO1 | Demonstrate thorough understanding of basic data types in Python and permissible operations on them |
| CO2 | Apply available programming constructs in Python to solve programming problems |
| CO3 | Apply object-oriented decomposition to model real-world scenarios and applications. |
| CO4 | Implement functions and utilize modules in Python to deliver the desired functionality. |
| CO5 | Demonstrate ability to use advanced I/O operations, exception handling and debugging. |

**Detailed Syllabus**

**Section-A**

**Unit 1:** Introduction to Python Programming Language: Introduction to Python Language, Strengths and Weaknesses, Built-in Functions, Conversions, Numeric Data Types, String Operators, String Slices, String Operations, String values, Naming Conventions, Integrated Development and Learning Environment, Dynamic Types.

**(10 Hrs)**

**Unit 2:** Data Collections and Language Component: Introduction, Control Flow and Syntax, Indenting, If Statement, Relational Operators, Logical Operators, Boolean, Bit Wise Operator, The While Loop, break and continue, For Loop, Lists, Tuples, Sets, Dictionaries, Sorting Dictionaries, Copying Collections.

**(8 Hrs)**

**Unit 3:** Object and Classes: Classes in Python, Principles of Object Orientation, Creating Classes, Instance Methods, File Organization, Special Methods, Class Variables, Inheritance, Polymorphism, Type Identification, Custom Exception Classes.

**(10 Hrs)**

**Section-B**

**Unit 4:** Functions and Modules: Introduction, defining your own Function, Parameters, Function Documentation, Keyword and Optional Parameters, Passing Collections to a Function, Variable Number of Arguments, Scope, Functions- “First Class Citizens”, Passing Function as an Argument, Mapping Functions in a Dictionary, Lambda, Modules, Standard Modules- ‘sys’, ‘math’, ‘time’, The ‘dir’ Function.

**(12 Hrs)**

**Unit 5:** I/O and Error Handling in Python: Introduction, Data Streams, creating your own Data Streams, Access Modes, Writing Data to a File, Reading Data from a File, Additional File Methods, Using Pipes as Data Streams, Handling I/O Exceptions, Working with Directories, Metadata, Errors, Run Time Errors, The Exception Model, Exception Hierarchy, and Handling Multiple Exceptions. **(12 Hrs)**

**Text Books**

| S. No. | Name of the Books | Author | Publisher | Edition (Pub. Yr.) |
| --- | --- | --- | --- | --- |
| 1 | Think Python | Allen B. Downey | O’Reilly | 2nd (2015) |
| 2 | Learning Python | Mark Lutz | O’Reilly | 5th (2013) |
| 3 | Core Python Programming | Wesley J. Chun | Pearson | 2nd (2007) |