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| **Course Title/ Code** | **Programming for Problem Solving using Python (CSW208B)** |
| **Course Type:** | Domain Core (Department) |
| **Course Nature:** | Workshop |
| **L-T-P-O Structure** | (0-0-3-0) |
| **Objective** | The course is designed to provide Basic knowledge of **Python**. **Python** programming is intended for software engineers, system analysts, program managers and user support personnel who wish to learn the **Python** programming language. |

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| **Syllabus** | **Sections** | **Weightage** |
| A | 25% |
| B | 25% |
| C | 25% |
| D | 25% |
| **TOTAL** | **100%** |

# Section-A

**Introduction**: Introducing the Python language, Understanding the Python shell, writing a simple program, Development environment setup, Concept of module and packages,

**Basic Operators** – Arithmetic, Relational, Assignment, Logical, Membership and Identity operators, Variables and Data Types, Understanding Mutable and Immutable types, Working with various type – None, Boolean(True/False), Numeric(int, float, long), Sequence(String, List & Tuple), Mapping(Dictionary) Understanding the concept of header & suites in the language construct, Conditionals and inline syntax, Multiple assignments in variables, Working with data type conversion, Working with Loops – While & For Effects of break, continue, pass & else statement in various construct.

**Section-B**

**Implementing custom functions**, Variable scope – Global vs. Local, Dealing with various function arguments – default, named and variable length arguments, Understanding the concept of pass by value and pass by reference, Returning multiple values from a function, Anonymous & Recursive function,

**Understanding Strings** in Python & different type of its delimiter, Working with special string operators & formatted strings, Exploring some useful built in string methods, Working with Date & Time,

# Section-C

**Understanding File Operations**, Working with the File Object for reading & writing, Object oriented programming in Python, Understanding Classes & Objects, and Exploring different components of a Class **, Class** inheritance & Method overriding, Working with multiple Inheritance, Understanding the Abstraction mechanism in Python, Built-in Class attributes, Exception handling,

**Section-D**

Python DB Interaction. Python Demonstration: Reading and Writing CSV files, The Series Data Structure, Querying a Series, The Data Frame Data Structure, Data Frame Indexing and Loading, Querying a Data Frame, Indexing Data frames, Missing Values.

**LIST OF EXPERIMENTS: Tool Used: -** Eclipse Java Oxygen

1. Using IDE to create and execute Python Program.
2. Programming Constructs in Python – Hands- on - Practice
3. Control Structure - Hands- on - Practice
4. String & List : Hands- on - Practice
5. Operation on Tuples : Hands- on - Practice
6. Mapping(Dictionary) : Hands- on - Practice
7. Function – Pass by reference : Hands- on - Practice
8. Working with the File Object for reading & writing
9. UML, Object Oriented Programming
10. Class inheritance & Method overriding : Hands- on – Practice
11. Exception handling : Hands- on - Practice
12. Python DB Integration

**Text Books:**

1. Dave Kuhlman, “A Python Book: Beginning Python, Advanced Python, and Python Exercises”, December 2013.
2. Mark Lutz’s, “Learning Python”, O'Reilly, 2001

**Reference Books:**

1. Sahana Kumaraswamy, Roy Antony Arnoid G, “Assignment for Object Oriented Programming using Python”, Infosys, Dec 2015.
2. Lutz, Mark, and Mark Lutz. Programming python. Vol. 8. O'Reilly, 1996.
3. Sommerville, “Software Engineering”, Addison Wesley, 1999.