CERTIFICATE COURSE ON DATA SCIENCE WITH PYTHON PROGRAMMING

1.PYTHON PROGRAMMING

UNIT-I

Introduction to Python: What is Data Science and why Data Science?

Applications and Components of data Science,Why Python for Data Science?

Basics of Algorithm/ Pseudocode , Program, Kinds of Programming Languages, Compilers, and Interpreters Introduction to Python, Types of IDE (Anaconda/PyCharm)

Identifiers, Variables, Operators, Data Types,

Conditions, Loops

UNIT-II

Introduction to Data Structures using Python:

Strings: Introduction, functions, and operations on Strings, Application Programs on Strings.

List: Introduction, functions and operations on List, Application Programs on Lists

Tuple: Introduction, functions, and operations on Tuple

Dictionaries: Introduction, functions and operations on Dictionaries, Application Programs on Dictionaries.

Sets: Introduction, functions, and operations on Sets, Applications on Sets, Frozensets List Comprehension, Dictionary Comprehension

UNIT-III

Functions, Modules and Collections : Functions Defining and Invoking functions, Scope, Parameter types Recursive functions, Built in Functions such as enumeration, zip, sorted, map, filter and Applications

Modules in Python, creating custom modules and calling them

Lambda functions , Collections, Iterators, Generators, Decorators, OrderedDict, defaultdictetc

UNIT-IV

Working with Databases and Text: File I/O operations: Reading and Writing data from various formats,Regular Expressions, Identifiers, Quantifiers. Application Programs on Regular Expressions

Working with Databases: Databases and Data Science, SQLite database and Insert, Update, Delete, Retrieve operations,

Exception Handling: Need for Exception handling, Raising exceptions,

UNIT-V

Object Oriented Programming using Python : Need for Static, Static members, Static functions Need for Encapsulation and Abstraction, Private Attributes, Getter, and Setter Methods– Python Implementation

Inheritance: Need for Inheritance, Kinds of Inheritance

Polymorphism Abstract methods, Overloading and Overriding

Statistics for Data Science

Use Case: Mathematical Computing with NumPy

UNIT-VI

Exploratory Data Analysis: Statistics and Probability using Numpy

Data Manipulation and Exploratory Data Analysis with Pandas

Matplotlib and Seaborn libraries for Visualization

Web Programming using Flask, GUI programming TCL TK