



SRI VENKATESWARA UNIVERSITY

I Year Syllabus for 4-Year UG Honours in B.Sc. (Data Mining) as Major in consonance with Curriculum framework w.e.f. AY 2025-26

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
I	I	1	Computer Fundamentals and Office Automation	3	3
			Computer Fundamentals and Office Automation-Practical	2	1
		2	Core Python Programming	3	3
			Core Python Programming-Practical	2	1
	II	3	Fundamentals of Data Mining	3	3
			Fundamentals of Data Mining-Practical	2	1
		4	R Programming Essentials for Data Mining	3	3
			R Programming Essentials for Data Mining-Practical	2	1

SEMESTER-I
COURSE 2: CORE PYTHON PROGRAMMING

Theory

Credits: 3

3 hrs/week

Objective

The objective of this course is to provide a comprehensive foundation in Python programming, enabling students to develop practical coding skills and a deep understanding of core concepts. Learners will:

- Gain proficiency with Python syntax, keywords, operators, data types, input/output, type conversion, and debugging.
- Understand program flow, selection, loops (including nested structures), and string manipulation techniques.
- Explore the design and implementation of functions (built-in, user-defined, recursive) and grasp variable scope.
- Acquire object-oriented programming skills in Python, including class creation, inheritance, polymorphism, and the use of modules and packages.
- Develop robust applications with exception handling, highlighting the differences from similar languages like Java.

Syllabus:

Unit-I

Getting Started with Python: Introduction to Python, Python Keywords, Identifiers, Variables Comments, Data Types, Operators, Input and Output, Type Conversion, Debugging. Flow of Control, Selection, Indentation, Repetition, Break and Continue Statement, Nested Loops. Strings- String Operations, Traversing a String, String handling Functions.

Unit-II

Functions: Functions, Built-in Functions, User Defined Functions, recursive functions. Scope of a Variable; **Python and OOP:** Defining Classes, Defining and calling functions passing arguments, Inheritance, polymorphism, Modules - date time, math, Packages; **Exception Handling-** Exception in python, Types of Exception, User-defined Exceptions.

Unit-III

List: Introduction to List, List Operations, Traversing a List, List Methods and Built-in Functions. Tuples and Dictionaries, Introduction to Tuples, Tuple Operations, Tuple Methods and Built-in Functions, Nested Tuples. Introduction to Dictionaries, Dictionaries are Mutable, Dictionary Operations, Traversing a Dictionary, Dictionary Methods and Built-in functions.

Unit-IV

Introduction to NumPy: Array, NumPy Array, Indexing and Slicing, Operations on Arrays Concatenating Arrays, Reshaping Arrays, Splitting Arrays, Statistical Operations on Arrays.

Unit V – File Handling and Modules

Reading and writing text files; Working with CSV, JSON, and XML files; **File operations:** open, close, delete, rename; Importing standard Python libraries (math, os, sys, datetime); Creating and using custom modules; Working with external libraries using pip.

Textbooks

1. Core Python Programming Wesley J. Chun Publisher: Prentice Hall PTR First Edition December 14, 2000 ISBN: 0-13-026036-3.
2. Reema Thareja – *Python Programming: Using Problem Solving Approach*, Oxford University Press, 2017.
3. Charles Dierbach – *Introduction to Computer Science Using Python: A Computational Problem-Solving Focus*, Wiley, 2015.

Reference Books

1. Allen B. Downey – *Think Python: How to Think Like a Computer Scientist*, 2nd Edition, Green Tea Press, 2015.
2. Wes McKinney – *Python for Data Analysis*, 2nd Edition, O'Reilly Media, 2017.
3. Eric Matthes – *Python Crash Course: A Hands-On, Project-Based Introduction to Programming*, No Starch Press, 2nd Edition, 2019.
4. David M. Beazley & Brian K. Jones – *Python Cookbook*, 3rd Edition, O'Reilly Media, 2013.
5. John Zelle – *Python Programming: An Introduction to Computer Science*, 3rd Edition, Franklin, Beedle & Associates, 2016.

SEMESTER-I
COURSE 2: CORE PYTHON PROGRAMMING

Practical

Credits: 1

2 hrs/week

Lab / Practical / Experiments / Tutorials Syllabus:

1. Write, execute, and debug Python programs.
2. Implement decision-making, looping, and modular programming.
3. Apply Python data structures effectively in problem-solving.
4. Handle files and work with structured data formats.
5. Use Python libraries and create reusable modules.
6. Develop small-scale applications using Python.
7. Program to find the Factorial of a Number using Recursion
8. Program to Generate Fibonacci Series using Loops
9. Program to Create and Display Student Marks using Dictionary
10. Program to Perform File Handling Operations (Write and Read a File)
11. Program to Implement a Simple Calculator using Functions

Tutorial / Practice Activities:

1. Debugging and error handling exercises.
2. Mini-project: Simple calculator, student database, or file-based contact manager.
3. Case study: Data analysis on a small CSV dataset.

SRI VENKATESWARA UNIVERSITY::TIRUPATI
B.Sc. Data Mining Honours
I year I Semester
Course 2: CORE PYTHON PROGRAMMING

MODEL QUESTION PAPER

Time: **3 Hours**

Max. Marks: **75**

PART-A

Answer any **FIVE** of the following. Each Question Carries 3 marks.

(5X3=15)

1. Short answer question from unit-I
2. Short answer question from unit-I
3. Short answer question from unit-II
4. Short answer question from unit-II
5. Short answer question from unit-III
6. Short answer question from unit-III
7. Short answer question from unit-IV
8. Short answer question from unit-IV
9. Short answer question from unit-V
10. Short answer question from unit-V

PART-B

Answer any **FIVE** of the following. Each Question Carries 12 marks.

(5X12=60)

11. a) Essay question from Unit-I
OR
b) Essay question from Unit-I
12. a) Essay question from Unit-II
OR
b) Essay question from Unit-II
13. a) Essay question from Unit-III
OR
b) Essay question from Unit-III
14. a) Essay question from Unit-IV
OR
b) Essay question from Unit-IV
15. a) Essay question from Unit-V
OR
b) Essay question from Unit-V