

**SES's L.S. RAHEJA COLLEGE OF ARTS AND COMMERCE
(AUTONOMOUS)**



BOARD OF STUDIES: Information Technology and Data Science

Programme: B.Sc. (Artificial Intelligence & Data Science)

Semester: II

Nomenclature of the Course: Python for AI

NEP Vertical: VSC

Credit: 02

Total Marks: 50

Academic Year: 2026–27

(As per Choice Based Credit System under NEP 2020)



Unit-wise Detailed Syllabus

Unit	Detailed Contents	Andragogy (Theory + Hands-on)	Hours
Unit I: Python Libraries for Data Processing & Visualization	1. Introduction to Python Ecosystem for AI 2. NumPy – Arrays, Vectorized Operations 3. Matrix Operations using NumPy 4. Pandas – Series and DataFrames 5. Data Cleaning & Preprocessing 6. Handling Missing Values 7. Matplotlib – Basic Plotting 8. Seaborn – Statistical Visualization	Live coding sessions, Dataset-based exercises Hands-on: • Creating NumPy arrays • Performing matrix operations • Data cleaning using Pandas • Creating line, bar, histogram & scatter plots	15
Unit II: Introduction to Machine Learning using Python	1. Introduction to Machine Learning in AI 2. Supervised vs Unsupervised Learning 3. Scikit-learn Overview 4. Simple Linear Regression Implementation 5. Classification – k-Nearest Neighbors (Concept + Basic Implementation) 6. Model Training and Testing 7. Model Evaluation – Accuracy, Confusion Matrix 8. Mini AI Workflow – Data → Train → Predict	Concept explanation + coding demonstration Hands-on: • Build regression model • Implement simple classification model • Train-test split • Evaluate model performance	15

Learning Objectives

1. To understand Python libraries used in AI development.
2. To preprocess and visualize datasets using Python tools.
3. To implement basic machine learning models.
4. To evaluate AI models using standard metrics.
5. To develop a simple AI workflow using real datasets.

Course Outcomes (CO)

CO No.	Course Outcome	Bloom's Level
CO1	Perform data manipulation using NumPy and Pandas	Apply (L3)
CO2	Visualize datasets using Matplotlib and Seaborn	Apply (L3)
CO3	Implement basic machine learning models using Scikit-learn	Apply (L3)
CO4	Evaluate model performance using appropriate metrics	Analyze (L4)
CO5	Develop a simple AI workflow from data preprocessing to prediction	Analyze (L4)

Suggested Readings

Sr. No.	Title	Author
1	Python for Data Analysis	Wes McKinney
2	Hands-On Machine Learning with Scikit-Learn	Aurélien Géron
3	Introduction to Machine Learning with Python	Andreas Müller
4	Official Scikit-learn Documentation	scikit-learn.org

QUESTION PAPER PATTERN

(A) FOR CONTINUOUS EVALUATION

Particulars	Marks
Class Test	10
Assignment / Programming Task	10
Total	20

B) FOR SEMESTER END EXAMINATION

Maximum Marks: 30

Duration: 1 Hour

Question No.	Description	Total Marks
Q1	Attempt Unit I	
	A – Understanding	15
	B – Applying	
	C – Analysing	
OR		
	P – Understanding	15
	Q – Applying	
	R – Analysing	
Q2	Attempt Unit II	
	A – Understanding	15
	B – Applying	
	C – Evaluating	
OR		
	P – Understanding	15
	Q – Applying	
	R – Evaluating	