VASAVI COLLEGE OF ENGINEERING(Autonomous)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031
Department of Computer Science & Engineering

MATHEMATICAL COMPUTING FOR AI & ML WITH PYTHON
Stream- Artificial Intelligence & Machine Learning
(OPEN ELECTIVE-II)
(COMMON for CIVIL, ECE, EEE & MECH)
SYLLABUS FOR B.E IV SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code:**U24OE420CS**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

Course objective	Course outcomes
Students should be able to	At the end of the course, students will be able to
1. Implementation with Python for mathematical computation to deepen the knowledge.	1. Develop a deep understanding of array usage with Numpy 2. Understanding and Analysing the Pandas Dataframe. 3. Basic concepts of data visualization and its importance in data analysis 4. Solve real life problem using the Linear Regression technique 5. Data representation using Scikit-learn library in Python

CO-PO and CO-PSO mapping

CO	PO												PSO		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	1	2	1	1								2		2
CO2	2	2	2	2	2								2		3
CO3	3	2	3	2	2								2		3
CO4	3	2	2	2	1								2		3
CO5	3	2	2	2	2								2		3

UNIT-I
Numpy Fundamentals: Creating arrays, array indexing, Basic Array Operations, one dimensional and n dimensional array, Creating Matrices using Numpy arrays, Matrix multiplication.

UNIT-II
Introduction to Pandas: Importing Pandas, Read CSV Files, Analysing Data, Cleaning Data, Pandas Data Structures- Series and Dataframe, Data Correlation.

UNIT-III
Data Visualization: Introduction to matplotlib, Data exploration with matplotlib- Loading the data, Pie chart, Scatter plot, Box Plot, Bar Chart, 3D plot.

UNIT-IV
Regression: Introduction to Regression, Linear Regression, Multiple Linear Regression, Polynomial Regression, Logistic Regression

UNIT-V
Scikit Learn – Introduction, Import packages and classes, Dataset Loading, Splitting the Dataset, Train the Model, Simple Linear Regression With scikit-learn, Multiple Linear Regression With scikit-learn.

Learning Resources:

1. Python Packages By Tomas Beuzen, Tiffany Timbers, 1st edition in 2022 by Chapman & Hall
2. Lambert K.A, Fundamentals of Python –First Programs, 1st Edition(2015), Cengage Learning India
3. Python for Data Analysis: Data Wrangling with pandas, NumPy, and Jupyter, Third Edition by Wes McKinney in 2022 published by Oreilly.
4. Python Machine Learning: Machine Learning and Deep Learning with Python, scikit-learn, and TensorFlow 2 by by Sebastian Raschka (Author), Vahid Mirjalili by packt publication on December 2019.
5. https://www.udemy.com/course/machine-learning-basics-building-regression-model-in-python/
6. https://www.geeksforgeeks.org/data-visualization-with-python/

The break-up of CIE : Internal Tests + Assignments + Quizzes

1	No. of Internal Tests:	02	Max.Marks for each Internal Tests:	30
2	No. of Assignments:	03	Max. Marks for each Assignment:	5
3	No. of Quizzes:	03	Max. Marks for each Quiz Test:	5

Duration of Internal Test: 1 Hour 30 Minutes