Python for Data Science

- Introducing Python - Python Basics, Operators, Loops, Functions, Strings, List, Tuples, Dictionary, Set, Object-oriented concepts(OOPs) and much more.
- Data Toolkit - Getting started with Files, Inventory Management System with Files, Inventory Management System with JSON, Mastering Numpy Arrays, Getting Started with OS , Jupyter Notebook Setup, OS with Python, etc.
- Libraries - Numpy, Pandas, Matplotlib, Streamlit, etc.

Statistics

- Linear Algebra Essentials
- Scalars, Vectors, Matrices, Matrix Operations, Inverse, Rank
- Systems of Equations & Eigen Concepts
- Solving Linear Systems, Determinants, Eigenvalues & Eigenvectors
- Vector Spaces & Norms
- Dot Product, Norms, Distance Metrics
- Calculus Basics
- Derivatives, Partial Derivatives, Chain Rule, Gradients
- Optimization
- Gradient Descent, Cost Functions, Minima/Maxima
- Multivariable Calculus

Data Analytics

- Data Analysis with Python: Getting started with Pandas, Data Preprocessing with Google Play store, Introduction to EDA, Data Cleaning, Data Visualization, Data Analysis
- Excel: Exploring Data, Preparing Data, Analysing Data, Important Interview Questions
- Power BI - Introduction to Power BI, Understanding Parameters, Basic Plots, Fundamentals of Power BI, Designing the Plots, etc

- Web Scraping - Learn how to Scrape, Selenium, Image Dataset Creation, and much more
- SQL - Databases Fundamentals, SQL Fundamentals, Data Manipulation(DML), Querying, Intermediate SQL Queries, Joining and combining Data, Set Theory Clauses, Subqueries, Window Functions, Data Preprocessing and analysis

Machine Learning & AI

- Introduction to AI, How Data Science Comes into Play,
- Linear Regression, Multiple Linear Regression & Polynomial Linear Regression,
- Support Vector Machines, Decision Trees, Random Forests,
- Classification Algorithms, Clustering Algorithms, Feature Engineering, and much more
- Statistical Foundation for ML: Descriptive & Inferential Statistics, Correlation & Covariance, Outlier Detection, Sampling Strategies, Statistical Bias & Variance, Central Limit Theorem

Specialization

- Deep Learning - Perceptrons, Multi-layer perceptron architecture, and Convolutional Neural Network (CNN)
- Image Processing - Fundamentals of Image Formation, Image Processing Techniques, Image Processing on Live WebCam, Taking a Selfie Program with OpenCV, Image Manipulation, DIY Instagram Filters, Masking, Adding Logo on a Live VideoFace Detection and Manipulation
- Natural Language Processing - Getting Started with NLP, Mastering Strings and ASCII Codes, Regular Expression from Scratch, Getting started with Spacy, Text Sequencing using Word Cloud, and much more

Generative AI

- What is Generative AI?
- Prompt Engineering Essentials

- Using OpenAI/Hugging Face APIs
- Text Generation Models (LLMs)
- Text-to-Image Generation (Stable Diffusion, DALL E)
- Image Dataset Generation Projects
- Building a Chatbot with LangChain
- Fine-tuning Concepts (High-level)
- Responsible & Ethical Use of GenAI

Projects

Data Analytics: Sugarcane Production , Black Friday Sales Data Analysis , Data Visualization on Heart Disease Dataset, GDP Analysis , Sales Data Analysis Using Covered Functions and Pivot Table , Superstore Sales Analysis Dashboard, Covid-19 World Dashboard , Wikipedia Scraper , Youtube Scrapper , Stock Images Infinite Scroll

Machine Learning: Predicting House Prices , Predictive Analysis in Diabetes , Customer Segmentation , Spell Checker, Guessing the title of a Corpus , Creating Own Instagram Filters , Selfies Capturing , Text Summarizer

Note: Additional projects will be assigned by the mentors during live sessions to enhance hands-on learning and practical understanding.