**■ Data Analysis & AI Teaching Syllabus**

Duration: 4-6 months (24 Weeks) | 3 Lectures per Week | Each Lecture = 2 Hours

# Month 1 – Preparation & Fundamentals

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| Week | Day(1) | Day(2) | Day(3) |
| Week(1) | Python Basics  (loops, functions) | OOP Basics + Exercises | Workshop: Python Practice |
| Week(2) | NumPy (arrays, indexing) | Pandas (DataFrames, Series) | Dataset Exploration Workshop |
| Week(3) | Matplotlib Basics | Seaborn (heatmap, pairplot) | Dashboard Visualization Workshop |
| Week(4) | Statistics: Mean, Median, Mode | Variance & Distributions | Statistical Analysis Project |

* Month 2 – Advanced Data Analysis

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| Week | Day(1) | Day(2) | Day(3) |
| Week(5) | Data Cleaning (missing values) | Handling Outliers | Practical Data Cleaning |
| Week(6) | Feature Engineering | Scaling & Encoding | Workshop: Feature Creation |
| Week(7) | SQL Basics | SQL Joins & Aggregation | Case Study with SQL |
| Week(8) | Mini Project 1: Real Dataset Analysis | Hands-on Project Work | Project Presentations |

* Month 3 – Intro to AI & ML

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| Week | Day(1) | Day(2) | Day(3) |
| Week(9) | Intro to ML (Supervised/  Unsupervised) | Scikit-learn Basics | Workshop: ML Pipeline |
| Week(10) | Linear Regression | Multiple Regression | Regression Project |
| Week(11) | Logistic Regression | KNN Classification | Workshop: Classification Models |
| Week(12) | Mini Project 2 | Project Work | Presentations |

* Month 4 – Advanced Algorithms

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| Week | Day(1) | Day(2) | Day(3) |
| Week(13) | Decision Trees | Tree Pruning | Workshop: Tree Models |
| Week(14) | Random Forest | Ensemble Methods | Comparison Workshop |
| Week(15) | K-Means Clustering | Hierarchical Clustering | Clustering Workshop |
| Week(16) | Mini Project 3 | Project Work | Presentations |

* Month 5 – Deep Learning

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| Week | Day(1) | Day(2) | Day(3) |
| Week(17) | Neural Networks Basics | Forward & Backpropagation | NN Workshop |
| Week(18) | TensorFlow Basics | PyTorch Basics | Hands-on TF/PyTorch |
| Week(19) | CNN Concepts | CNN for Images | Workshop: CNN Models |
| Week(20) | Mini Project 4 | Project Work | Presentations |

* Month 6 – Advanced AI Applications

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| Week | Day(1) | Day(2) | Day(3) |
| Week(21) | NLP Basics | Text Preprocessing | Workshop: Sentiment Analysis |
| Week(22) | RNN Concepts | LSTM Overview | Workshop: Text Prediction |
| Week(23) | MLOps Concepts | Model Deployment with Flask | Workshop: Streamlit App |
| Week(24) | Final Project | Project Development | Capstone Presentations |