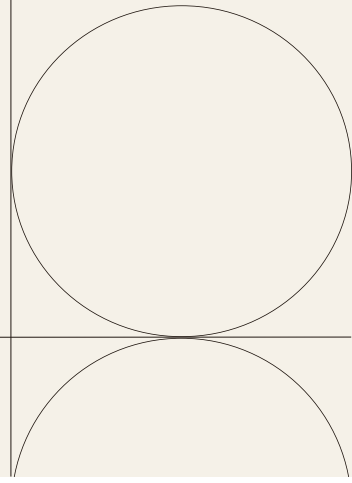


# AYOMI AI - Classes



## DATA Science (Syllabus)

1. Introduction to Data Science	<ul style="list-style-type: none"> <li>• What is Data Science?</li> <li>• Data Science vs. Machine Learning vs. Artificial Intelligence</li> <li>• Applications of Data Science</li> <li>• Roles and Responsibilities of a Data Scientist</li> </ul>
2. Mathematics and Statistics for Data Science	<ul style="list-style-type: none"> <li>• Linear Algebra (vectors, matrices, eigenvalues/eigenvectors)</li> <li>• Probability Theory (distributions, Bayes' theorem)</li> <li>• Descriptive Statistics (mean, median, variance, etc.)</li> <li>• Inferential Statistics (hypothesis testing, p-values, confidence intervals)</li> <li>• Sampling Methods and Estimations</li> <li>• Regression Analysis (simple and multiple)</li> </ul>
3. Programming for Data Science	<ul style="list-style-type: none"> <li>• Introduction to Python or R <ul style="list-style-type: none"> <li>◦ Python Libraries: NumPy, Pandas, Matplotlib, Seaborn</li> <li>◦ R Libraries: ggplot2, dplyr, tidyr</li> </ul> </li> <li>• Data Structures (lists, arrays, dataframes)</li> <li>• Functions, Loops, and Conditional Statements</li> <li>• File Handling (reading, writing data from CSV, JSON, SQL)</li> </ul>
4. Data Preprocessing	<ul style="list-style-type: none"> <li>• Data Cleaning (handling missing data, outliers)</li> <li>• Data Transformation (scaling, encoding, normalization)</li> <li>• Feature Engineering (creating new features, feature selection)</li> <li>• Text Data Processing (tokenization, stopwords, TF-IDF)</li> </ul>
5. Exploratory Data Analysis (EDA)	<ul style="list-style-type: none"> <li>• Data Visualization (histograms, boxplots, scatterplots, etc.)</li> <li>• Correlation and Covariance</li> <li>• Identifying trends and patterns</li> <li>• Summary Statistics</li> <li>• Using Matplotlib, Seaborn, and Plotly for visualizations</li> </ul>
6. Machine Learning	<ul style="list-style-type: none"> <li>• Supervised Learning: <ul style="list-style-type: none"> <li>◦ Linear Regression</li> <li>◦ Logistic Regression</li> <li>◦ Decision Trees and Random Forests</li> <li>◦ Support Vector Machines (SVM)</li> <li>◦ k-Nearest Neighbors (k-NN)</li> <li>◦ Neural Networks</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>● Unsupervised Learning: <ul style="list-style-type: none"> <li>○ Clustering (K-means, Hierarchical)</li> <li>○ Dimensionality Reduction (PCA, t-SNE)</li> </ul> </li> <li>● Model Evaluation (cross-validation, metrics like accuracy, precision, recall, F1 score)</li> </ul>
7. Deep Learning	<ul style="list-style-type: none"> <li>● Introduction to Neural Networks</li> <li>● Backpropagation and Gradient Descent</li> <li>● Convolutional Neural Networks (CNNs)</li> <li>● Recurrent Neural Networks (RNNs) and LSTMs</li> <li>● TensorFlow and Keras</li> </ul>
8. Natural Language Processing (NLP)	<ul style="list-style-type: none"> <li>● Text Preprocessing (tokenization, lemmatization, stemming)</li> <li>● Bag-of-Words, TF-IDF, Word2Vec</li> <li>● Sentiment Analysis</li> <li>● Named Entity Recognition (NER)</li> <li>● Text Classification and Clustering</li> </ul>
9. Big Data and Data Engineering	<ul style="list-style-type: none"> <li>● Introduction to Big Data Tools (Hadoop, Spark)</li> <li>● Distributed Data Processing</li> <li>● Working with NoSQL Databases (MongoDB, Cassandra)</li> <li>● Data Pipelines and ETL (Extract, Transform, Load)</li> <li>● Cloud Platforms (AWS, Azure, Google Cloud)</li> </ul>
10. Model Deployment and Production	<ul style="list-style-type: none"> <li>● Model Deployment using Flask/Django</li> <li>● Introduction to REST APIs</li> <li>● Cloud Deployment (AWS, GCP, Heroku)</li> <li>● Continuous Integration and Continuous Deployment (CI/CD)</li> <li>● Model Monitoring and Maintenance</li> </ul>
11. Capstone Project	<ul style="list-style-type: none"> <li>● Working on a real-world dataset</li> <li>● Applying Data Science techniques to solve a business problem</li> <li>● Presenting results and insights using visualizations</li> </ul>
Optional: Special Topics in Data Science	<ul style="list-style-type: none"> <li>● Reinforcement Learning</li> <li>● Advanced Deep Learning (GANs, Transformers)</li> <li>● Time Series Analysis</li> <li>● Recommender Systems</li> </ul>

