### Introduction to ML (20 pages)

* 1. What is Machine Learning
  2. ML Vs DL vs AI
  3. Types of Machine Learning
  4. Applications of Machine Learning
  5. Challenges in ML
  6. ML Development Lifecycle
  7. Data-based job profiles

### End to End project (20 pages)

* 1. Overview of the project
  2. Data ingestion
  3. Data preprocessing
  4. EDA
  5. Feature Engineering
  6. Model Building
  7. Model Evaluation

### Data Ingestion & Data Cleaning (25 pages)

* 1. Data analysis process
  2. Data gathering from .csv
  3. Data gathering using SQL
  4. Data gathering from APIs
  5. Data gathering using Web Scraping
  6. How to assess data
  7. Types of unclean data
  8. Cleaning the data

### Exploratory Data Analysis (EDA) (20 pages)

* 1. Introduction to EDA
  2. Why do we need EDA
  3. Steps for EDA
  4. Univariate Analysis
  5. Bivariate Analysis

### Feature Engineering 1 - Feature Scaling, Feature Encoding & Feature Transformation (30 pages)

* 1. Ordinal Encoding
  2. Label Encoding
  3. One Hot Encoding
  4. Discretization
  5. Standardization
  6. Min Max Scaling
  7. Robust Scaling
  8. Log Transform
  9. Box-Cox Transform
  10. Yeo-Johnson Transform

### Feature Engineering 2 - Handling Missing Values & Outlier Detection (30 pages)

* 1. Simple Imputer
  2. KNN Imputer
  3. Iterative Imputer
  4. Outliers & their impact
  5. Univariate outlier detection and removal
  6. Multivariate outlier detection and removal

### Linear Models (40 pages)

* 1. The intuition behind Simple Linear Regression
  2. Code Example
  3. Multiple Linear Regression
  4. Code Example
  5. Gradient Descent
  6. Regression Metrics
  7. Regression Analysis
  8. Polynomial regression
  9. Multicollinearity

### Regularized Linear Models (25 pages)

* 1. Bias-Variance Tradeoff
  2. Overfitting & Underfitting
  3. Ridge Regression
  4. Lasso Regression
  5. Elastic-net Regression

### Non-Linear Models (40 pages)

* 1. SVM Classifier
  2. SVM Regressor
  3. KNN Classifier
  4. KNN Regressor
  5. Naive Bayes Classifier
  6. Decision Tree Classifier
  7. Decision Tree Regressor

### Ensemble Methods (40 pages)

* 1. Voting Ensemble
  2. Bagging
  3. Random Forest
  4. Boosting
  5. Gradient Boosting
  6. XGBoost
  7. Stacking

### Dimensionality Reduction (30 pages)

* 1. Curse of Dimensionality
  2. Feature Selection
  3. Feature Extraction using PCA
  4. T-sne

### Clustering (25 pages)

* 1. Applications of Unsupervised Learning
  2. K-Means Clustering
  3. Hierarchical Clustering
  4. DBSCAN

### Model Evaluation & Selection (30 pages)

* 1. ML Evaluation Metrics
  2. Cross Validation
  3. Data Leakage
  4. Hyperparameter Tuning

### Handling Imbalanced Datasets (25 pages)

* 1. Problem with Imbalanced data
  2. Undersampling
  3. Oversampling
  4. SMOTE
  5. Ensemble methods

### Recommender Systems [Optional] (20 pages)

* 1. The need for recommender systems
  2. Types of Recommender Systems
  3. Creating a Content-based Recommender System