**DATA SCIENCE COURSE SYLLABUS**

**### Module 1: Introduction to Data Science**

**- Overview of Data Science**

**- Applications of Data Science**

**- Understanding Data, Information, and Knowledge**

**- Role of Data Scientist**

**- Data Science Process**

**### Module 2: Python for Data Science**

**- Python Basics**

**- Data Types and Variables**

**- Control Structures (If, Else, For, While)**

**- Functions and Modules**

**- Working with Libraries: NumPy, Pandas, Matplotlib, Seaborn**

**### Module 3: Data Collection and Data Cleaning**

**- Importing Data from CSV, Excel, Database**

**- Data Cleaning Techniques**

**- Handling Missing Values**

**- Data Transformation**

**- Feature Engineering**

**### Module 4: Exploratory Data Analysis (EDA)**

**- Descriptive Statistics**

**- Data Visualization Techniques**

**- Correlation and Covariance**

**- Outlier Detection and Handling**

**### Module 5: Statistics for Data Science**

**- Probability and Probability Distributions**

**- Measures of Central Tendency and Dispersion**

**- Hypothesis Testing**

**- Statistical Tests (T-test, Chi-square, ANOVA)**

**### Module 6: Machine Learning Algorithms**

**- Supervised vs Unsupervised Learning**

**- Linear Regression**

**- Logistic Regression**

**- Decision Trees and Random Forest**

**- Support Vector Machines (SVM)**

**- K-Means Clustering**

**- Principal Component Analysis (PCA)**

**### Module 7: Model Evaluation and Improvement**

**- Model Validation**

**- Cross Validation Techniques**

**- Performance Metrics (Accuracy, Precision, Recall, F1 Score)**

**- Hyperparameter Tuning**

**- Model Optimization**

**### Module 8: Deep Learning Basics**

**- Introduction to Neural Networks**

**- Forward and Backward Propagation**

**- Activation Functions**

**- Introduction to TensorFlow and Keras**

**- Building and Training Neural Networks**

**### Module 9: Natural Language Processing (NLP)**

**- Text Preprocessing (Tokenization, Lemmatization, Stopwords)**

**- Word Embeddings (Word2Vec, GloVe)**

**- Sentiment Analysis**

**- Text Classification**

**- Chatbots and Virtual Assistants**

**### Module 10: Model Deployment and Version Control**

**- Introduction to Model Deployment**

**- Deployment on Cloud Platforms (Streamlit, Gradio, Flask)**

**- Building APIs using Flask/FastAPI**

**- Containerization using Docker**

**- Version Control with Git and GitHub**

**- Continuous Integration and Continuous Deployment (CI/CD)**

**### Module 11: Git and Version Control**

**- Purpose of Version Control**

**- Popular Version Control Tools**

**- Git Distribution Version Control**

**- Terminologies**

**- Git Workflow and Architecture**

**- Creating New Repositories (Init, Clone)**

**- Code Commits, Pull, Fetch, and Push**

**- Handling Merge Conflicts**

**- Working with GitHub and Bitbucket**

**- Creating GitHub Account**

**- Collaborating with Developers**

**### Module 12: Capstone Project**

**- End-to-End Data Science Project**

**- Problem Statement Definition**

**- Data Collection and Cleaning**

**- Model Building and Evaluation**

**- Deployment of Model**