

# Data Science Roadmap with Timeline

## Phase 1: Foundations (1-2 Months)

- Learn Python/R programming
- Understand basic statistics and probability
- Get comfortable with data types, loops, and functions
- Familiarize with Jupyter Notebooks and basic data visualization (Matplotlib, Seaborn)

## Phase 2: Data Handling & Analysis (2-3 Months)

- Learn NumPy and Pandas for data manipulation
- Work with real-world datasets (CSV, JSON, Excel)
- Explore data cleaning and preprocessing techniques
- Visualize data insights using advanced plots

## Phase 3: Machine Learning Basics (2-3 Months)

- Understand supervised vs unsupervised learning
- Learn ML algorithms (Linear Regression, Decision Trees, KNN, Clustering)
- Use Scikit-learn for model building
- Evaluate models with metrics like accuracy, precision, recall, F1-score

## Phase 4: Advanced Topics (3-4 Months)

- Deep dive into Neural Networks & Deep Learning (using TensorFlow/Keras)
- Explore NLP, Computer Vision, and Time Series
- Learn about cloud deployment (AWS, Azure, GCP)
- Build and deploy end-to-end ML projects

## Continuous Learning & Career Prep

- Practice on platforms like Kaggle and HackerRank
- Build a strong portfolio with GitHub projects
- Contribute to open-source or research papers
- Prepare for interviews with case studies and mock tests