

12-Week Learning Plan: Data Science, AI & ML

Week 1-2: Python for Data Science

Topics:

- List, dict, tuple operations
- Functions, OOP basics
- File I/O and exception handling
- Lambda, map, filter, reduce

Resources:

- Python for Data Science (freeCodeCamp video)
- Practice on HackerRank

Project:

- Build a CSV reader that summarizes data (e.g., count, average)

Week 3-4: NumPy, Pandas, and Matplotlib

Topics:

- NumPy: arrays, broadcasting, vectorized operations
- Pandas: Series, DataFrames, filtering, merging, grouping
- Matplotlib/Seaborn: plotting charts

Resources:

- NumPy & Pandas tutorial
- Seaborn guide

Project:

- Analyze a dataset and visualize patterns

Week 5: Statistics & Math for ML

Topics:

- Descriptive statistics

12-Week Learning Plan: Data Science, AI & ML

- Probability distributions
- Correlation and regression
- Central Limit Theorem

Resources:

- Khan Academy: Statistics & Probability
- StatQuest YouTube Channel

Project:

- Write Python scripts to calculate basic statistics

Week 6-7: Machine Learning with Scikit-learn

Topics:

- ML pipeline
- Regression, KNN, Trees, SVM
- Model evaluation metrics

Resources:

- Scikit-learn tutorials
- Google ML Crash Course

Project:

- Build a house price or iris flower prediction model

Week 8: SQL and Data Handling

Topics:

- SQL basics and joins
- Python + SQL integration

Resources:

12-Week Learning Plan: Data Science, AI & ML

- SQLBolt
- Mode Analytics SQL Tutorial

Project:

- Analyze dataset via SQL and visualize in Python

Week 9-10: Deep Learning with TensorFlow or PyTorch

Topics:

- Neural Network basics
- CNNs and backprop

Resources:

- TensorFlow Crash Course
- PyTorch Beginner Guide

Project:

- Handwritten digit recognizer (MNIST)

Week 11: NLP and Hugging Face

Topics:

- Tokenization, Word2Vec, TF-IDF
- Transformers (BERT)

Resources:

- Hugging Face NLP Course
- RealPython NLTK tutorial

Project:

- Build sentiment analysis tool

12-Week Learning Plan: Data Science, AI & ML

Week 12: Model Deployment & Portfolio

Topics:

- Streamlit/Gradio
- Model saving and deployment

Resources:

- Streamlit Docs
- Gradio Tutorial

Project:

- Deploy an ML model as a web app