

6-Month AI/ML Foundations Plan (Free Resources)

Detailed 6-Month Weekly Plan to Build AI/ML Foundations

Month 1: Python Programming Basics

Week 1:

- Python syntax, variables, data types, control flow
- Resources: Python for Everybody (Coursera, audit for free) Weeks 1-2, Automate the Boring Stuff, Chapters 1-3

Week 2:

- Functions, loops, conditionals
- Practice coding problems on HackerRank (Python domain)

Week 3:

- Lists, dictionaries, file handling
- Practice coding challenges on LeetCode (easy)

Week 4:

- Classes and OOP basics
- Practice coding problems on LeetCode, Python basics

Month 2: Python for Data Science

Week 5:

- NumPy basics: arrays, math operations
- Resource: NumPy Quickstart Tutorial (official docs)

Week 6:

- Pandas basics: DataFrames, reading CSV files
- Resource: Pandas 10-minute tutorial (official docs)

Week 7:

- Data visualization basics
- Resource: Matplotlib tutorial (official docs)

Week 8:

- Practice data manipulation with small project (Titanic or Iris dataset)

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Month 3: Math Fundamentals for ML

Week 9:

- Linear algebra basics: vectors, matrices, multiplication
- Resource: 3Blue1Brown Essence of Linear Algebra (first 6 videos)

Week 10:

- Linear algebra continued: eigenvalues, eigenvectors
- Resource: 3Blue1Brown continuation + Khan Academy Linear Algebra

Week 11:

- Calculus basics: derivatives, gradients
- Resource: Khan Academy Calculus 1 (derivatives sections)

Week 12:

- Probability & statistics basics: distributions, mean, variance
- Resource: Khan Academy Statistics and Probability fundamentals

Month 4: Intro to Machine Learning

Week 13:

- What is ML? Types, workflow
- Resource: Andrew Ng ML Course (Coursera) Week 1

Week 14:

- Linear regression, gradient descent
- Resource: Andrew Ng ML Course Week 2

Week 15:

- Logistic regression, classification basics
- Resource: Andrew Ng ML Course Week 3

Week 16:

- Decision trees, overfitting, model evaluation
- Resource: Andrew Ng ML Course Week 4

Month 5: More ML Algorithms & Tools

Week 17:

- Support Vector Machines, KNN

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- Resources: Andrew Ng ML Course Week 5 + Google ML Crash Course

Week 18:

- Clustering (K-Means) and Unsupervised learning
- Resources: Andrew Ng ML Course Week 6 + Google ML Crash Course

Week 19:

- Model evaluation metrics (accuracy, precision, recall)
- Resources: Andrew Ng ML Course Week 7 + practice with scikit-learn

Week 20:

- Hands-on with Scikit-learn: basic models
- Resources: Scikit-learn tutorials + small classification project

Month 6: Mini Projects & Portfolio Building

Week 21:

- Titanic Dataset: Data cleaning, feature engineering
- Resources: Kaggle Titanic tutorial + practice data manipulation

Week 22:

- Titanic Dataset: Build and evaluate models
- Resources: Train logistic regression, decision trees using Scikit-learn

Week 23:

- MNIST Dataset: Image recognition intro
- Resources: Load dataset, build simple classifier with Scikit-learn

Week 24:

- Portfolio setup: Document projects on GitHub
- Resources: Create GitHub repos, write README, optional blog posts

Tips for Success:

- Practice daily (1 hour minimum)
- Keep notes of key concepts
- Join ML communities (Reddit, Kaggle)
- Ask questions frequently