AI Engineering 18-Month Roadmap (Study + Resources)

This plan follows a 6 hours/day, 18-month structure. Each section includes the best free + paid resources for that stage.

■■ Months 1–3: Foundations (Python, Math, DSA)

Python Programming - Python for Everybody – Coursera - Automate the Boring Stuff with Python (Free book)

Mathematics for AI - 3Blue1Brown – Essence of Linear Algebra (YouTube) - Khan Academy – Calculus, Probability, Statistics

Data Structures & Algorithms - Book: Grokking Algorithms - Practice: LeetCode, HackerRank

■ Months 4–6: Machine Learning Basics

Core ML - Andrew Ng's Machine Learning – Coursera - Book: Hands-On Machine Learning with Scikit-Learn, Keras & TensorFlow

Projects - Kaggle Datasets for mini-projects - Document projects on GitHub (with notebooks + README)

■ Months 7–9: Deep Learning

Neural Networks - Deep Learning Specialization – Coursera - fast.ai Practical Deep Learning

CNNs (Computer Vision) - Implement LeNet, AlexNet, ResNet in PyTorch/TensorFlow - Kaggle Image Classification competitions

RNNs (NLP & Time Series) - Sequence models with LSTMs & GRUs - Text generation project

■ Months 10–12: Advanced Topics + Capstone

Reinforcement Learning - OpenAI Spinning Up - Deep Reinforcement Learning Nanodegree – Udacity

NLP - Hugging Face NLP Course - Implement BERT, GPT, Transformers

Capstone Project - End-to-end ML project (choose domain: NLP, CV, RL) - Write a detailed report + blog post - Showcase on GitHub

■■ Months 13–15: AI Engineering + Deployment

Deployment - Docker Official Docs - Deploy with FastAPI / Flask - AWS/GCP Free Tier

MLOps - Full Stack Deep Learning - Made With ML

■ Months 16–18: Specialization + Industry

Applications - Healthcare AI: medical imaging, diagnostics - Finance AI: fraud detection, trading - Robotics & Autonomous Systems

Networking - Conferences: NeurIPS, ICML, CVPR - Communities: Reddit r/MachineLearning, Weights & Biases Discord

■ Ongoing (Every Week / Month)

Research Papers: arXiv, Papers With Code Competitions: Kaggle, DrivenData Networking: LinkedIn, Discord, Reddit AI groups Open Source: Contribute to PyTorch, Hugging Face, Scikit-Learn

■■ Daily Routine (6 Hours/Day)

2–3 hrs: Learning Theory (courses, books, videos) 2–3 hrs: Hands-on Coding (projects, Kaggle, GitHub) 1–2 hrs: Review + Practice Problems (LeetCode, HackerRank) 1 hr: Networking / Community engagement