Roadmap to Becoming an AI Engineer

Phase 1: Foundations of Programming & Math

Skills to Build:
- Python: syntax, functions, OOP, modules, NumPy, pandas, matplotlib
- Math: Linear Algebra, Calculus, Probability, Statistics
- Data Structures & Algorithms

Resources:
- Python for Everybody (Coursera)
- Khan Academy – Linear Algebra & Probability
- CS50 (Harvard) for algorithms

Phase 2: Core AI & Machine Learning Knowledge

Skills to Build:
- Supervised & Unsupervised Learning
- ML Tools: scikit-learn, XGBoost, TensorFlow, PyTorch
- Model Evaluation: accuracy, precision, recall, AUC, F1-score

Resources:
- Andrew Ng's ML Course (Coursera)
- Hands-On ML with scikit-learn, Keras & TensorFlow (Aurélien Géron)

Phase 3: Specialization in AI Disciplines

Focus Areas:
- NLP: sentiment analysis, summarization, transformers (Hugging Face, spaCy)
- Computer Vision: image classification, object detection (OpenCV, YOLO)
- AI Agents: LangChain, OpenAI API, RAG

Projects to Build:
- Chatbot using LLM (OpenAI API)
- Image classifier for diagnosis
- News summarizer or translator

Phase 4: AI System Design & Deployment

Skills to Build:
- MLOps: model training → deployment → monitoring (MLflow, FastAPI, Docker)
- Cloud: AWS SageMaker, Lambda, Docker, Kubernetes

Resources:
- Full Stack Deep Learning
- Made With ML

Phase 5: Real-World Experience

Strategies:
- Build a GitHub portfolio (3–5 projects)
- Contribute to open source (LangChain, Hugging Face)
- Join hackathons, Kaggle, internships, freelancing

Phase 6: Stay Ahead of the Curve

Ongoing Habits:
- Follow research (arXiv, The Batch, Two Minute Papers)
- Track new models and tools (Claude, Gemini, etc.)
- Fine-tune your own models (LoRA, QLoRA)