THE BEGINNER ROADMAP

# Learn AI from zero, in the right order.

41 hand-picked resources in 8 steps: YouTube channels, free university courses, docs, practice sites and a few Udemy courses. Start at step 1, don't skip ahead.

| 41 | 35 | 12 | 5 |
|---|---|---|---|
| resources | free | YouTube | on Udemy |

**How to use this**

1. Do the steps in order. One course per step is enough, you don't need all of them.
2. After each step, build one small thing and put it on GitHub.
3. Tap any title to open it. The link is also printed under each one.

Links checked on 16 November 2026. Courses and prices change, so look at the date and reviews before paying for anything. Udemy courses are paid and often on sale.

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STEP 1 OF 8

# Start here: what AI actually is

Read or watch one of these first. No code, no maths.

01 **Elements of AI** — FREE COURSE
University of Helsinki
Plain-language intro to what AI can and can't do. No coding.
elementsofai.com

02 **Intro to Large Language Models** — FREE YOUTUBE
Andrej Karpathy
A one-hour talk on how ChatGPT-style models work.
youtube.com/watch?v=zjkBMFhNj_g

03 **Neural networks** — FREE YOUTUBE
3Blue1Brown
The best visual explanation of what a neural network is.
youtube.com/playlist?list=PLZHQObOWTQDNU6R1_67000Dx_ZCJB-3pi

04 **Deep Dive into LLMs like ChatGPT** — FREE YOUTUBE
Andrej Karpathy
Longer follow-up: training, hallucination, how to think about a model.
youtube.com/watch?v=7xTGNNLPyMI

STEP 2 OF 8

# Python: the one language you need

Get comfortable reading and writing small scripts before anything else.

01 **CS50's Introduction to Programming with Python** — FREE COURSE
Harvard
University-grade Python with problem sets.
cs50.harvard.edu/python

02 **CS50P full course video** — FREE YOUTUBE
freeCodeCamp
The same course as one long video, if you prefer watching.
youtube.com/watch?v=nLRL_NcnK-4

03 **Kaggle Learn: Python, Pandas, Intro to ML** — FREE COURSE
Kaggle
Short hands-on lessons that run in the browser.
kaggle.com/learn

04 **10 minutes to pandas** — FREE DOCS
pandas docs
The quickest way to learn working with tables of data.
pandas.pydata.org/docs/user_guide/10min.html

05 **The Complete Python Bootcamp** — PAID · UDEMY

Jose Portilla

Popular from-zero Python course. Check price and reviews before buying.

udemy.com/course/complete-python-bootcamp

06 **Python for AI and Machine Learning** — PAID · UDEMY

Udemy

Python basics, then scikit-learn, TensorFlow and PyTorch in Google Colab.

udemy.com/course/python-for-ai

STEP 3 OF 8

# Maths: just enough, no more

You don't need a maths degree. You need these three ideas: vectors and matrices, probability, and slopes (gradients).

01 **Essence of linear algebra** — FREE · YOUTUBE

3Blue1Brown

Vectors and matrices as pictures, not formulas.

youtube.com/playlist?list=PLZHQObOWTQDPD3MizzM2xVFitgF8hE_ab

02 **Linear algebra** — FREE · COURSE

Khan Academy

Practice problems to go with the videos.

khanacademy.org/math/linear-algebra

03 **Machine Learning playlist** — FREE · YOUTUBE

StatQuest with Josh Starmer

Probability and statistics behind ML, explained slowly and clearly.

youtube.com/playlist?list=PLblh5JKOoLUICTaGLRoHQDuF_7q2GfuJF

04 **Dive into Deep Learning** — FREE · BOOK

d2l.ai

Free interactive book with maths and code side by side. Dip in as needed.

d2l.ai

STEP 4 OF 8

# Machine learning: how computers learn from data

Do at least one full course and train a few models yourself.

01 **Machine Learning Specialization** — PAID CERTIFICATE · COURSE

Andrew Ng, DeepLearning.AI

The classic first ML course. Check Coursera for audit or aid options.

coursera.org/specializations/machine-learning-introduction

02 **Machine Learning Crash Course** — FREE · COURSE
Google
Short, practical lessons with exercises.
developers.google.com/machine-learning/crash-course

03 **100 Days of Machine Learning** — FREE · YOUTUBE · HINDI
CampusX
A full ML playlist taught in Hindi.
youtube.com/playlist?list=PLKnIA16_Rmvbr7zKYQuBfsVkjoLcJgxHH

04 **Machine Learning for Everybody** — FREE · YOUTUBE
freeCodeCamp
Gentle full-length intro with code.
youtube.com/watch?v=i_LwzRVP7bg

05 **ML for Beginners** — FREE · GITHUB
Microsoft
A structured curriculum with lessons, quizzes and projects.
github.com/microsoft/ML-For-Beginners

06 **scikit-learn: Getting started** — FREE · DOCS
scikit-learn docs
The library most beginner ML code uses.
scikit-learn.org/stable/getting_started.html

07 **Harvard CS50's AI with Python** — FREE · YOUTUBE
freeCodeCamp
Search, learning and neural networks in one course.
youtube.com/watch?v=5NgNicANyqM

08 **Machine Learning, Data Science & AI Engineering with Python** — PAID · UDEMY
Udemy
Long hands-on course. Check the last-updated date before buying.
udemy.com/course/data-science-and-machine-learning-with-python-hands-on

STEP 5 OF 8

# Deep learning: neural networks from scratch

Build one tiny network by hand, then switch to PyTorch.

01 **Neural Networks: Zero to Hero** — FREE · YOUTUBE
Andrej Karpathy
You code a neural network and a language model, step by step.
youtube.com/playlist?list=PLAqhIrjkxbuWI23v9cThsA9GvCAUhRvKZ

02 **Practical Deep Learning for Coders** — FREE · COURSE
fast.ai
Code first, theory later. Very practical.
course.fast.ai

03 **PyTorch: Learn the Basics** — FREE · DOCS

PyTorch

Official starter tutorial for the framework most AI teams use.

pytorch.org/tutorials/beginner/basics/intro.html

04 **AI for Beginners** — FREE · GITHUB

Microsoft

A curriculum from classic AI to neural networks.

github.com/microsoft/AI-For-Beginners

STEP 6 OF 8

## LLMs and transformers: the tech behind ChatGPT

This is where modern AI jobs live.

01 **Transformers, the tech behind LLMs** — FREE · YOUTUBE

3Blue1Brown

A visual walk through how a transformer works.

youtube.com/watch?v=wjZofJX0v4M

02 **Let's build GPT: from scratch, in code** — FREE · YOUTUBE

Andrej Karpathy

Build a small GPT yourself. The best way to really understand it.

youtube.com/watch?v=kCc8FmEb1nY

03 **LLM Course** — FREE · COURSE

Hugging Face

Use and fine-tune open models with real code.

huggingface.co/learn/llm-course

04 **Short courses** — MANY FREE · COURSE

DeepLearning.AI

One-hour courses on prompting, RAG, agents and more.

deeplearning.ai/short-courses

05 **Generative AI for Beginners: AI, ML and LLM Fundamentals** — PAID · UDEMY

Udemy

Lighter on maths and code. Check reviews first.

udemy.com/course/generative-ai-for-beginners-ai-ml-llm-fundamentals

STEP 7 OF 8

## Build with AI: prompts, RAG and agents

Stop only watching. Ship small things.

01 **Prompt engineering interactive tutorial** — FREE · GITHUB

Anthropic

Hands-on lessons on writing prompts that work.

github.com/anthropics/prompt-eng-interactive-tutorial

02 **Anthropic courses** — FREE · GITHUB

Anthropic

Notebooks on the API, tool use and evaluation.

github.com/anthropics/courses

03 **Generative AI for Beginners** — FREE · GITHUB

Microsoft

Lessons on building apps with generative AI.

github.com/microsoft/generative-ai-for-beginners

04 **AI Agents Course** — FREE · COURSE

Hugging Face

Learn how agents work and build your own.

huggingface.co/learn/agents-course

05 **Learn Prompting** — FREE · COURSE

Learn Prompting

A free guide to prompting techniques.

learnprompting.org

06 **Model Context Protocol: introduction** — FREE · DOCS

modelcontextprotocol.io

How AI apps connect to tools and data.

modelcontextprotocol.io/introduction

07 **LangChain Academy** — FREE · COURSE

LangChain

Courses on building with LangChain and LangGraph.

academy.langchain.com

08 **Complete Generative AI Course: RAG, AI Agents and Deployment** — PAID · UDEMY

Udemy

Needs basic Python and ML first. Check reviews before buying.

udemy.com/course/generative-ai-for-beginners-chatbots-rag-mcp-ai-agents

STEP 8 OF 8

## Practice: where you actually get good

Do these alongside the courses, not after.

01 **Titanic: Machine Learning from Disaster** — FREE · PRACTICE

Kaggle

The classic first ML project. Predict who survived.

kaggle.com/c/titanic

02 **Kaggle Learn** FREE PRACTICE

Kaggle

Finish the micro-courses, then enter a competition.

kaggle.com/learn

## Four first projects

1. A spam or sentiment classifier on a small dataset (scikit-learn).
2. A model that predicts house prices from a Kaggle dataset, then explain why it is wrong sometimes.
3. A chatbot over your own PDFs (a small RAG app).
4. A tiny agent that reads your email subjects and sorts them with an LLM.

## Four mistakes to skip

- **Watching ten courses and building nothing.** After every module, build something small and put it on GitHub.
- **Starting with the heaviest maths.** Use the maths only when a lesson needs it. Come back to it later.
- **Skipping Python.** Everything else sits on it. Be comfortable before you start ML.
- **Jumping straight to agents and frameworks.** Learn what a model is first. Frameworks change every few months, basics don't.

Made by chalkesahil. If a link stops working, comment on the reel and it gets fixed.