# Free AI Training and Learning from Huggingface.co



Hugging Face hosts a large catalog of f**ree, open-source AI courses**, cookbooks, and interactive learning resources under its **Hugging Face Learn** hub. All courses are self-paced, include hands-on Google Colab notebooks, and offer **free certificates** upon completion. Here are some of their most popular courses:

## 1. Official Hugging Face Courses

| Course | Focus & Curriculum | Prerequisites |
|---|---|---|
| **LLM Course** *(formerly NLP Course)* | Using the `transformers`, `datasets`, `tokenizers`, and `accelerate` libraries; fine-tuning models, building RAG pipelines, and deploying LLMs. See below for study plan. | Basic Python & PyTorch/TensorFlow |
| **AI Agents Course** | Building autonomous agents from scratch and using frameworks (`smolagents`, LlamaIndex, LangGraph) for tool-calling and reasoning. See below for course overview. | Basic Python & LLM familiarity |
| **Deep Reinforcement Learning Course** | Theory and practice of RL—Q-Learning, Deep Q-Networks, Policy Gradients, PPO, and multi-agent environments using Unity ML-Agents and Gymnasium. | Python & basic deep learning |
| **Diffusion Models Course** | How image and audio generation models work under the hood, training diffusion models from scratch, and fine-tuning Stable Diffusion with the `diffusers` library. | Python & PyTorch basics |
| **Computer Vision Course** | Image classification, object detection, segmentation, vision transformers (ViT), and multimodal vision-language models. | Python & basic ML concepts |
| **Audio Course** | Speech recognition (ASR), audio classification, text-to-speech (TTS), and working with architectures like Whisper and Wav2Vec2. | Python & basic deep learning |
| **ML for Games Course** | Integrating AI into game development—NPC dialogue, procedural generation, and running lightweight models inside Unity and Unreal Engine. | Basic game dev or Python |
| **ML for 3D Course** | 3D data representations (point clouds, meshes, NeRFs, Gaussian Splatting) and generating 3D assets with machine learning. | Python & basic 3D/ML familiarity |
| **Open-Source AI** | A living collection of practical, code-first notebooks | Varies by recipe |

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|---|---|---|
| Cookbook | covering advanced RAG, model evaluation, quantization, fine-tuning, and multimodal workflows. | |

## 2. Additional Free Learning Resources on Hugging Face

- **Hugging Face Tasks:** An interactive reference encyclopedia covering dozens of ML tasks (e.g., Text Generation, Image-to-Text, Zero-Shot Classification). Each page breaks down the problem, lists top open-source models, provides sample inference code, and links to live demos.
- **Library Documentation & Tutorials:** Step-by-step developer guides for the core ecosystem, including **PEFT** (Parameter-Efficient Fine-Tuning / LoRA), **TRL** (Transformer Reinforcement Learning / RLHF / DPO), **optimum** (hardware acceleration), and **Gradio** (building web UIs for ML models).
- **Hugging Face Spaces:** Thousands of interactive, community-built web apps where you can inspect the source code (`app.py`) to see how models are loaded, prompted, and chained together in production.
- **Daily Papers:** A curated feed of trending AI research papers with community discussions, direct links to the models/datasets released alongside the paper, and quick summaries.
- **Hugging Face Blog:** Deep-dive technical walkthroughs written by Hugging Face engineers and open-source researchers on new model architectures, fine-tuning benchmarks, and optimization techniques.

## 3. Hugging Face AI Agents Course Overview

The **Hugging Face AI Agents Course** is a free, hands-on curriculum designed to take developers from basic agentic theory to building, evaluating, and benchmarking production-ready autonomous agents.

| Unit | Title | Core Focus & Takeaways |
|---|---|---|
| **Unit 0** | Onboarding | Setting up your Hugging Face account, development environment, and choosing between the self-audit track or the free certification track. |
| **Unit 1** | Introduction to Agents | Core agentic concepts: the **Think → Act → Observe** loop, how LLMs act as the reasoning engine via chat templates and special tokens, and building raw Python function tools from scratch without frameworks. |
| **Unit 2** | Frameworks for AI Agents | Implementing agent architectures across three major open-source libraries:<br>• **2.1 `smolagents`:** Hugging Face's lightweight, code-first agent library.<br>• **2.2 `LlamaIndex`:** Building data-aware agents using indexes, query engines, and workflows.<br>• **2.3 `LangGraph`:** Designing stateful, multi-step production workflows with fine-grained control over execution graphs. |
| **Unit 3** | Use Case: | Moving beyond static Retrieval-Augmented Generation to build |

| Unit | Title | Core Focus & Takeaways |
| --- | --- | --- |
| | **Agentic RAG** | dynamic agents that decide when and how to search, combine web/weather/dataset tools, and synthesize multi-source answers. |
| **Unit 4** | **Final Assignment & Benchmark** | Building and deploying a complete agent to compete on a live student leaderboard evaluated against the **GAIA benchmark** (a rigorous real-world assistant evaluation suite). |