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6-Month Generative AI Study & Training Plan: Weekly Breakdown with Learning Resources

Month 1: Core Foundations (Python + Math)

Week 1:

- Learn Python syntax, variables, data types, functions
Resources: Python for Everybody (Coursera), W3Schools Python, Replit tutorials
- Practice on HackerRank or LeetCode (easy problems)
Platform: [hackerrank.com](https://www.hackerrank.com), leetcode.com
- Install Jupyter Notebook/Google Colab
Tools: [Google Colab](https://colab.research.google.com), Anaconda

Month 2: ML & Deep Learning Foundations

Week 1:

- ML Basics: Supervised vs Unsupervised Learning
Course: Andrew Ng's ML Course (Coursera)
- Linear and Logistic Regression
Resource: StatQuest YouTube, Scikit-Learn docs
- Practice on Scikit-Learn
Platform: Google Colab, Kaggle notebooks

Week 2:

- Neural Networks: perceptrons, activation functions
Course: Deep Learning Specialization (Coursera)
- Forward/backpropagation intuitively
Resource: 3Blue1Brown "Neural Networks" series
- TensorFlow/Keras basics
Resource: TensorFlow official tutorials, Keras.io

Week 3:

- CNNs: filters, pooling, image classification task
Resource: Stanford CS231n (intro lectures)
- Build a CNN for MNIST or CIFAR-10
Platform: Kaggle or Colab notebook

Week 4:

- Autoencoders: compression and reconstruction
Resource: DeepLearning.ai, Keras blog
- Mini project: Build an image denoiser

Month 3: Introduction to Generative Models

Week 1:

- VAE: theory and code implementation
Resource: PyTorch examples, Deep Learning with Python (François Chollet)
- Use VAE to generate handwritten digits

Week 2:

- GANs: architecture and training stability challenges
Resource: Ian Goodfellow's NIPS talk, DeepLearning.ai GAN specialization
- DCGAN implementation on CelebA or MNIST
Resource: PyTorch DCGAN tutorial

Week 3:

- Transformer introduction: self-attention, multi-head
Resource: The Illustrated Transformer by Jay Alammar
- Jay Alammar's Illustrated Transformer
Link: jalammar.github.io

Week 4:

- Build a Transformer for text generation (small dataset)
Tool: PyTorch or TensorFlow

- Compare outputs of VAE vs GAN vs Transformer
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Month 4: LLMs & Text Generation

Week 1:

- Dive into GPT-2 architecture
Resource: OpenAI blog, paperswithcode.com
- Use Hugging Face Transformers to load pre-trained models
Tool: huggingface.co

Week 2:

- Generate text using GPT-2 and T5
Resource: Hugging Face tutorials
- Experiment with prompts and temperature settings

Week 3:

- Fine-tune GPT-2 on a custom dataset (stories, articles)
Tool: Hugging Face Trainer API
- Evaluate model outputs

Week 4:

- Build a simple chatbot using Hugging Face pipeline
Tool: Transformers pipeline + Gradio
 - Deploy on Streamlit with interactive UI
Platform: streamlit.io
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Month 5: Multimodal Generative AI (Image, Audio, Video)

Week 1:

- Use Stable Diffusion to generate images
Tool: Hugging Face Diffusers
- Try the Diffusers library from Hugging Face

Week 2:

- Explore StyleGAN2 and its configuration
Resource: NVIDIA StyleGAN repo, YouTube tutorials
- Train on a subset of images (e.g., art or faces)

Week 3:

- Bark or MusicGen for audio generation
Tool: Hugging Face Spaces or Replicate
- Play with text-to-audio models via APIs

Week 4:

- Build a pipeline that combines text + image + audio
 - Example: Story prompt -> Image + Narration
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Month 6: Projects, Portfolio & Deployment

Week 1:

- Choose capstone project (e.g., Story generator, AI DJ)
- Set up GitHub repo and project outline
Platform: GitHub, Notion for planning

Week 2:

- Develop project core functionality
Tools: Streamlit, Gradio, Hugging Face

Week 3:

- Polish frontend, integrate multiple modalities (if needed)
- Deploy using Hugging Face Spaces, Render, or Heroku

Week 4:

- Finalize documentation and GitHub README
Resource: Make a good README guide (GitHub)
- Write LinkedIn post + Medium blog explaining the journey
- Apply to open source AI projects or beginner Kaggle challenges

Would you like this exported into a Notion board, Trello board, or Google Sheet for daily tracking?

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