Generative AI Mastery Checklist (Comprehensive Version)

This detailed checklist breaks down the Generative AI mastery staircase into 15 progressive steps. Each step includes minute details so you can clearly benchmark your journey and guide your team's upskilling path.

Step 1: AI Foundations

- ☐ Learn basic AI and ML terminology (models, training, inference)
- ☐ Understand differences between AI, Machine Learning, and Deep Learning
- ☐ Study supervised, unsupervised, and reinforcement learning basics

Step 2: Prompt Engineering

- ☐ Explore zero-shot, one-shot, and few-shot prompting
- ☐ Experiment with role-based prompts (e.g., 'Act as a…')
- ☐ Learn prompt patterns (chain-of-thought, self-consistency)

Step 3: LLM Fundamentals

- ☐ Understand architecture of Large Language Models (transformers, attention mechanism)
- ☐ Learn differences between proprietary (OpenAI, Anthropic) and open-source (LLaMA, Mistral) models
- ☐ Test models using simple APIs or playgrounds

Step 4: Basic Applications

- ☐ Build a simple chatbot using an LLM API
- ☐ Generate summaries, translations, or text completions
- ☐ Test with real-world documents (PDFs, notes, reports)

Step 5: Responsible AI

- ☐ Understand AI ethics and bias issues
- ☐ Learn about data privacy and compliance (GDPR, HIPAA)
- ☐ Apply guardrails to avoid harmful or unsafe outputs

Step 6: Fine-Tuning

- ☐ Learn difference between fine-tuning, LoRA, and parameter-efficient tuning
- ☐ Prepare and clean domain-specific datasets
- ☐ Train and deploy a small fine-tuned model

Step 7: Integration into Stack

- ☐ Connect LLMs with your applications via APIs

- ☐ Use orchestration frameworks (LangChain, Haystack)
- ☐ Experiment with database integrations and workflow triggers

Step 8: Retrieval-Augmented Generation (RAG)

- ☐ Learn basics of vector databases (Pinecone, Weaviate, pgVector)
- ☐ Chunk and embed documents into vector stores
- ☐ Connect retrieval pipelines to enhance LLM responses

Step 9: Multi-Modal AI

- ☐ Work with models handling text, images, and audio (e.g., Gemini, GPT-4o)
- ☐ Build applications that combine modalities (captioning, vision + text Q&A)
- ☐ Explore speech-to-text and text-to-speech integrations

Step 10: Monitoring & Evaluation

- ☐ Set up logging and tracing for AI apps
- ☐ Define evaluation metrics (accuracy, relevance, latency)
- ☐ Create feedback loops for continuous improvement

Step 11: Agentic Workflows

- ☐ Understand concept of autonomous agents and planning loops
- ☐ Implement basic agent frameworks (LangGraph, CrewAI)
- ☐ Build multi-agent collaboration with defined roles

Step 12: Synthetic Data

- ☐ Generate synthetic datasets for training and testing
- ☐ Learn benefits and risks of synthetic data
- ☐ Apply synthetic data to improve scarce or sensitive datasets

Step 13: Domain-Specific Applications

- ☐ Explore case studies in healthcare, legal, and finance
- ☐ Train or fine-tune models on domain corpora
- ☐ Build proof-of-concepts for specialized AI solutions

Step 14: Scalability & Production

- ☐ Learn model deployment best practices (Docker, Kubernetes)
- ☐ Optimize inference speed and cost
- ☐ Implement monitoring for uptime and scaling

Step 15: Leadership & Contribution

- ☐ Share learnings via blogs, talks, or open-source contributions
- ☐ Mentor team members or lead AI adoption initiatives