Comprehensive AI Training Curriculum for GPT-Centric Knowledge Base & Assistant

This curriculum is designed using a **pyramid learning structure**, supporting both breadth and depth: every module builds from **Foundation Knowledge and Skills** to **Core Concepts**, then advances into **Specialized Topics**, and culminates in **Real World Applications**. Each section highlights internationally recognized thought leaders and best-in-class resources where possible.

Curriculum Overview

Tier	Focus Area	Sample Topics
Foundation Knowledge	Essentials and Tools	Python, GitHub, Basic Statistics, APIs, Data Viz
Core Concepts	Core ML and AI Mechanisms	Neural Nets, Decision Trees, Gradient Descent, CNNs
Advanced Topics	Specializations and LLMs, Modern ML Techniques	LSTMs, Vector DBs, RAG, Multi-Agent Systems
Real World Applications	End-to-End Project Integration	AI Agents, Video Creation, Fine-Tuning, Workflow

1 Real World Applications

2 Advanced Topics

3 Core Concepts

4 Foundation Knowledge
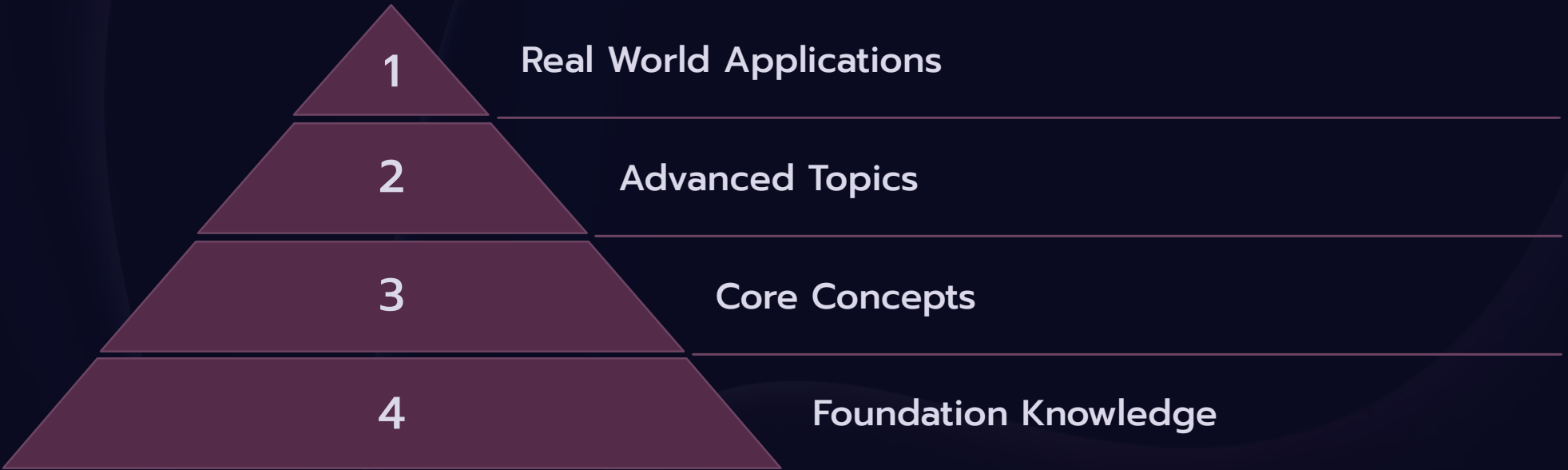
The pyramid structure ensures a comprehensive learning journey that builds progressively from essential skills to practical applications, creating a robust knowledge base for AI practitioners.

Foundation Knowledge and Skills

Objective: Equip learners with baseline coding ability, AI literacy, and data skills.

Python Programming

- Core syntax, functions, data structures, OOP
- Suggested resource: Python for Everybody (Dr. Chuck), Automate the Boring Stuff

Data Analysis & Visualization

- Pandas, NumPy, Matplotlib, Seaborn
- Fundamental statistics and exploratory analysis

APIs & Web Integration

- Interacting with RESTful APIs, basic requests

Git & GitHub

- Version control, repository workflows, collaboration

Foundational Math for AI

- Linear algebra, probability, calculus basics
- Recommended: Khan Academy (Sal Khan), 3Blue1Brown

AI Literacy

- History, branches of AI, ethical principles, responsible AI, data privacy fundamentals

Core Concepts

Objective: Introduce the central mechanisms and methods underpinning AI and ML.

Neural Networks & Machine Learning Fundamentals

- Perceptrons, backpropagation, activation functions
- Andrew Ng, Deep Learning Specialization

Decision Trees & Gradient Descent

- Classification/regression trees, boosting, ensemble methods
- Mathematical formulation/explanation of gradient descent
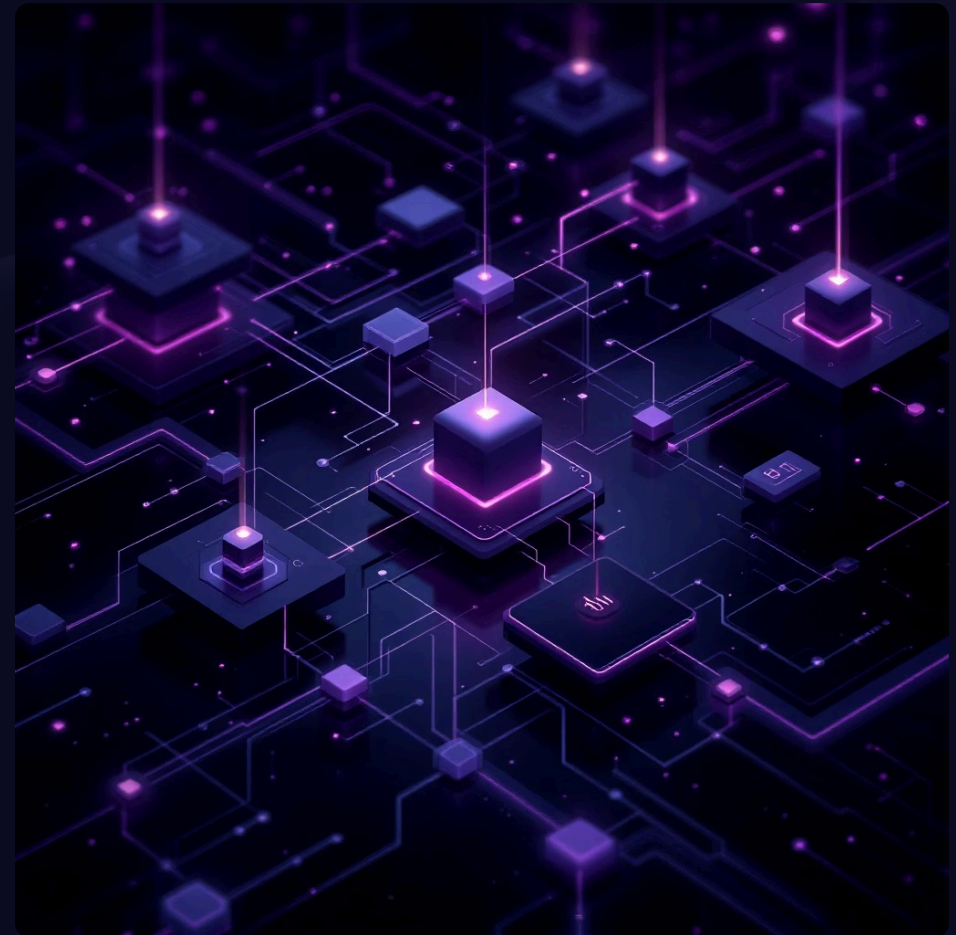
Deep Learning Core

- CNNs (Convolutional Neural Networks): image processing, architectures

Sequence Learning

- LSTMs and RNNs: sequence learning (text/time series)

Model Training

- Model training, validation, overfitting

Data Engineering & Data Prep

- Data ingestion, cleaning, feature engineering
- Use of relevant code languages besides Python (R, JavaScript, etc.)

Advanced Topics

Objective: Deepen practical expertise, engage with emerging tools and methods.

Large Language Models (LLMs) & Retrieval-Augmented Generation (RAG)

- Foundations of LLMs and transformer architecture
- Principles/implementation of RAG and embedding search
- Fine-tuning LLMs, prompt engineering (including using Claude, OpenAI models)
- Recommended leaders: Andrej Karpathy, Yann LeCun, Ethan Mollick, OpenAI, Anthropic's Claude team

Embeddings & Vector Databases

- Semantic search, FAISS, Pinecone, Chroma, Milvus

Multi-Agent & Agentic Systems

- Building and orchestrating AI agents (crewAI, AutoGen, LangChain, OpenAI agents APIs)
- Multi-agent workflows, orchestration platforms, agent design patterns
- MCPs (Multi-Chain Protocols): Orchestrating tools, inter-agent communication

Specialized AI Workflows

- Fine-tuning models, knowledge-base construction, advanced data pipelines
- Versioning and deployment (MLOps basics & tools: Vertex AI, Hugging Face Hub)

Video Creation & Generative Media

- AI-powered video tools (Descript, Synthesia), deepfakes, storyboard automation
- MidJourney, generative art, synthesis and prompt design for visual media

Interaction with Analytics & Business Tools

- Using Claude and other LLMs with GA4, connecting outputs to business intelligence dashboards

Real World Applications

Objective: Integrate previous tiers into applied, project-based, and professional contexts.

Project Development

- End-to-end AI solution (from dataset, via model, to deployment and enduser experience)
- Full-stack integration: APIs, microservices, web apps leveraging AI models
- Case studies: ChatGPT as a knowledge base, agent assistant deployments

Evaluation & Continuous Improvement

- Testing outputs, collecting user feedback, regular updates as AI advances
- Quality and compliance audits

AI for Staff Training/AI Knowledge Base

- Structuring organizational AI knowledge, onboarding new agents, supporting human teams
- Building retrieval-augmented, high-accuracy training assistants

AI for Project Assistance

- Automating research, summarization, code review, and documentation generation

Leading Experts and Recommended Sources

Area	Notable Experts/Organizations
Python & Programming	Dr. Charles Severance, Guido van Rossum
Machine Learning	Andrew Ng, François Chollet, Aurélien Géron
Neural Nets/Deep Learning	Yann LeCun, Geoffrey Hinton, Andrej Karpathy
LLMs & Prompt Engineering	OpenAI (Sam Altman), Anthropic, Ethan Mollick
Data Science	Cassie Kozyrkov, Hilary Mason
AI Ethics	Timnit Gebru, Margaret Mitchell
Agentic Systems	Microsoft Research, Stanford AI Lab, LangChain
Visualization	Hans Rosling, Hadley Wickham
AI in Education	Sal Khan, Charles Fadel, Priten Shah

This curated list of experts provides learners with access to the most authoritative voices in each specialized area of AI and machine learning, ensuring high-quality, cutting-edge knowledge throughout the curriculum.

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Sample Learning Pathway and Course Features

Foundation

Python, Git/GitHub, data analysis, AI basics, responsible AI

Core Concepts

ML algorithms (regression, trees, clustering), neural networks, gradient descent, APIs

Advanced/Specialization

LLMs, RAG, agentic systems (AutoGen, crewAI), vector DBs, MLOps, prompt engineering, video AI

Application

Build a custom GPT-based assistant, deploy as staff knowledge base, integrate with project tools, real-world capstone projects

Course Features for High Quality

Blended Learning

Video lectures, interactive projects, hands-on labs, quizzes per tier

Global Leader Content

Integrate guest lectures from renowned experts in each module

Case Studies

Practical applications in finance, healthcare, business, and edtech

Curated Resources

Stay cutting-edge as new AI trends emerge with continuously updated resources

This curriculum is structured to ensure the GPT built from this training is a robust, explainable, up-to-date resource for staff, AI agents, and project teams approaching AI education with rigor, application, and expertise at every level.