THINKLAND.AI

AI Coding (15+ y/o)

AI Programming 500 – Building with Generative AI

Course Description
This course is an applied introduction to Generative AI for students who want to understand how GenAI works and how to build with it. Through hands-on exercises, students will learn the fundamentals of large language models (LLMs) and practice creating their own projects.

By the end of the course, students will be able to:

- Understand how large language models work at a conceptual level, including how they learn, generate language, and adapt to tasks through methods like fine-tuning or retrieval-augmented generation.
- Evaluate AI tools responsibly by comparing outputs across models and recognizing issues such as hallucination, bias, and misuse.
- Apply effective prompting strategies from simple instructions to structured techniques like few-shot examples and chain-of-thought reasoning.
- Build basic Generative AI applications using APIs, multi-modal tools, and frameworks such as LangChain or LlamaIndex.
- Create and present projects that demonstrate both conceptual understanding and real-world applications of Generative AI.

Structure
The course is structured around **16 modules** that progress from foundations to applications. Early modules introduce students to Generative AI, LLMs, and prompting, while later modules dive into advanced applications, frameworks, and project-building. Throughout the course, students will explore real tools (e.g., ChatGPT, Gemini, NotebookLM) and libraries (e.g., LangChain, LlamaIndex).

Final Project
Throughout the course, students will build a single Generative AI project that develops step by step as they learn new concepts and techniques. By the end of the course, this project will grow into a fully functioning application that demonstrates their technical skills and creativity. Students will present their work as a finished product they can showcase beyond the classroom.

Who Should Enroll
This course is for students with basic Python experience who want to learn how Generative AI works and how to build with it, with no prior AI knowledge required.

Level 1:

Module 1: Introduction to Gen AI and Large Language Models
Module 2: Responsible AI Use
Module 3: Exploring AI Systems
Module 4: Prompting Fundamentals
Module 5: First Applications (Text-based)
Module 6: Multi-Modal and Creative AI
Module 7: Evaluation and Efficiency (Cost) (?)
Module 8: AI Application UI/UX
Capstone Part I

Level 2:

Module 9: Deeper LLM Mechanics
Module 10: Fine-tuning & Instruction Following
Module 11: Embeddings & RAG
Module 12: Tool Use & Agents
Module 13: Safety & Deployment

Module 14: Exploring Frameworks for LLM Applications
Module 15: Exploring Specialized LLM Applications
Capstone Part II

(note: largely modeled after the open source course by Microsoft)

Level 3:

Module 16: Advanced LLM Architectures
Module 17: Memory & Long-Context Models
Module 18: Multi-Agent Systems
Module 19: Optimization & Efficiency at Scale
Module 20: Advanced RAG Systems
Module 21: Multi-Modal Foundation Models
Module 22: Safety, Alignment & Governance
Module 23: Capstone Part III

(Level 3 is completely theoretical, if not too difficult for AI401 and should be in AI500)

About: https://school.thinkland.ai/about

Teachers: https://school.thinkland.ai/teacher

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