CTR-808 AI Developer

About This Course

This course provides an in-depth and practical foundation for becoming an AI Developer. It is designed for technical professionals seeking to build, train, and deploy AI models using real-world tools and frameworks. Participants will explore machine learning, deep learning, and generative AI while developing and deploying intelligent applications using Python, TensorFlow/Keras, and cloud services. The course also emphasizes ethical AI development and prepares learners for real-world integration and deployment.

Audience Profile

This course is intended for:

- Developers and software engineers
- Data scientists and analysts
- Technical professionals interested in AI development
- Individuals aiming to build and deploy AI models in production environments

Course Outline

Module 1: Introduction to AI Development • AI vs ML vs Deep Learning: Key distinctions • Overview of AI development lifecycle • Setting up the AI development environment (Python, Jupyter, Colab) Learning Outcomes: ✓ Understand AI development stages ✓ Set up tools for AI development ✓ Recognize key AI domains and use cases

Module 2: Python for AI Developers • Essential Python libraries: Numpy, Pandas, Matplotlib • Data preprocessing and feature engineering • Exploratory Data Analysis (EDA) for AI models Learning Outcomes: ✓ Process and analyze data ✓ Prepare data for model input ✓ Visualize and interpret datasets

Module 3: Machine Learning Algorithms • Supervised and Unsupervised Learning (Regression, Classification, Clustering) • Building ML models with Scikit-learn • Model evaluation and optimization techniques Learning Outcomes: ✓ Build ML models from scratch ✓ Evaluate and optimize ML models ✓ Select the right algorithm for the problem

Module 4: Deep Learning with Neural Networks • Neural Networks: Architecture and training process • Using TensorFlow and Keras to build models • Applications: Image classification and basic NLP Learning Outcomes: ✓ Build deep learning models ✓ Train and evaluate neural networks ✓ Apply DL models to real-world tasks

Module 5: Natural Language Processing (NLP) • Text preprocessing, tokenization, and embeddings • Sentiment analysis and text classification • Introduction to Transformers (BERT, GPT) Learning Outcomes: ✓ Process and analyze text data ✓ Build NLP models ✓ Utilize pre-trained language models

Module 6: Generative AI and Large Language Models (LLMs) • Overview of Generative AI and LLMs • Using OpenAI API and other LLM platforms • Fine-tuning models for specific tasks Learning Outcomes: ✓ Understand LLM capabilities ✓ Use LLMs for content generation ✓ Customize AI model outputs

Module 7: Model Deployment and Integration • Deploying AI models using Flask, FastAPI, and Streamlit • Creating APIs for AI model access • Dockerizing AI applications for deployment Learning Outcomes: ✓ Deploy models as web services ✓ Create scalable AI APIs ✓ Package and deploy using Docker

Module 8: AI in the Cloud (AWS, Azure, GCP) • Overview of AI services in the cloud • Training and deploying models in cloud environments • Serverless AI workflows and automation Learning Outcomes: ✓ Utilize cloud AI tools ✓ Deploy AI models at scale ✓ Automate workflows using cloud platforms

Module 9: AI Ethics, Bias, and Responsible Development • Understanding AI fairness and bias • Ensuring transparency and explainability • Ethical deployment of AI models Learning Outcomes: ✓ Develop responsible AI applications ✓ Identify and mitigate AI bias ✓ Implement explainable AI practices

Module 10: Final Project: Full AI Application Development • Define and scope a real-world AI use case • Build, train, and deploy an AI solution • Present and document the end-to-end AI workflow Learning Outcomes: ✓ Execute a complete AI project ✓ Integrate AI into an application ✓ Present AI-driven solutions professionally

Prerequisites

Participants should have:

- Basic programming knowledge (preferably in Python)
- Familiarity with software development concepts
- Interest in AI, data, and building intelligent applications