



TECHNOCATION FREELANCING TRAINING INSTITUTE & SOFTWARE HOUSE

# Professional Generative AI Course Outline

## Module 1: Introduction to Generative AI

- What is Generative AI?
  - Evolution of AI: From Rule-Based to Generative Models
  - Applications of Generative AI (Text, Images, Audio, Video, Code)
  - Ethical Considerations & AI Bias in Generative Models
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## Module 2: Fundamentals of Deep Learning for Generative AI

- Overview of Neural Networks & Deep Learning
  - Understanding Autoencoders & Variational Autoencoders (VAEs)
  - Backpropagation & Optimization Techniques
  - Introduction to PyTorch & TensorFlow for Generative AI
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## Module 3: Language Models & Text Generation

- Natural Language Processing (NLP) Basics
  - Working with Large Language Models (LLMs)
  - Text Generation using GPT (ChatGPT, GPT-4, LLaMA)
  - Fine-Tuning & Customizing Language Models for Specific Tasks
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## Module 4: Image Generation with Generative AI

- Introduction to Convolutional Neural Networks (CNNs)

- Style Transfer & Image Synthesis
  - Generative Adversarial Networks (GANs) for Image Generation
  - Diffusion Models (Stable Diffusion, DALL·E)
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## **Module 5: Audio & Video Generation**

- Speech Synthesis & Text-to-Speech (TTS) Models
  - Music Generation using AI (Jukebox, Magenta)
  - Deepfake Technology & Video Synthesis
  - Ethical & Legal Considerations in AI-Generated Media
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## **Module 6: Code Generation & AI for Software Development**

- AI-Powered Code Assistants (GitHub Copilot, Tabnine)
  - Generating Code with LLMs (Codex, ChatGPT)
  - Automating Software Development with AI
  - Debugging & Code Optimization using Generative AI
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## **Module 7: Fine-Tuning & Custom AI Model Training**

- Collecting & Preprocessing Data for Custom AI Models
  - Transfer Learning & Model Fine-Tuning Techniques
  - Training Custom GPT, Stable Diffusion, or GANs
  - Evaluating & Deploying Fine-Tuned Models
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## **Module 8: Deploying Generative AI Applications**

- Using APIs (OpenAI, Hugging Face, Stability AI)
  - Building AI-Powered Chatbots & Virtual Assistants
  - Cloud-Based AI Deployment (Google Cloud, AWS, Azure)
  - Monetizing Generative AI Applications
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## **Final Module: Capstone Project & Certification**

- Hands-on Project: AI-Generated Content in a Real-World Scenario
- Model Evaluation & Performance Optimization
- AI Ethics, Bias Mitigation & Responsible AI Practices
- Course Completion Certification