Module 4: **Language Models and Transformer-based Generative Models Topics:**

• Exploring Language Models

• Types of Language Models

• Applications of Language Models

• The Transformer Architecture: Attention Mechanism

• Advanced Transformer Models

• GPT

• BERT

• Applications of Transformer-based Models

Module 5: **Prompt Engineering**

**Topics:**

• Prompt Engineering Principles

• What is Prompt Engineering?

• Importance and Applications

• Prompt Design Strategies

• Types of Prompting

• Crafting Effective Prompts

• Parameter Tuning

Module 6: **Generative AI with LLMs**

**Topics:**

• LLMs and Generative AI Project Lifecycle

• LLM Pre-Training and Scaling

• Fine-Tuning LLMs with Specific Instructions

• Efficient Fine-Tuning of Parameters

• Reinforcement Learning from Human Response

Module 7: **LLMs for Search, Prediction, and Generation Topics:**

• Search Query Completion

• Next Word Prediction

• Word Embeddings

• Transformers

• Generating Text

• Stacking Attention Layers

Module 8: **LangChain for LLM Application Development**

**Topics:**

• LangChain Foundations

• Benefits of using LangChain

• Using LangChain to Develop LLM Applications

• Value Propositions of LangChain

• Components of LangChain

• Off-the-Shelf Chains in LangChain

• Build and Deploy LLM-Powered Applications using LangChain

Module 9: **Interacting with Data Using LangChain and RAG Topics:**

• Understanding Retrieval-Augmented Generation (RAG)

• Document Loading and Splitting

• Vector Stores and Embeddings

• Retrieval

• Question Answering with Chatbots

• Building RAG Models using LangChain

Module 10: **Generative AI on Cloud**

**Topics:**

• Cloud Computing Foundations

• AWS S3

• Amazon EC2 Trn1n

• Amazon EC2 Inf2

• Amazon Sagemaker

• Amazon CodeWhisperer

• Amazon Bedrock

• Azure OpenAI

Module 11: **Working with ChatGPT (Self-paced)**

**Topics:**

• Introduction to ChatGPT

• Leveraging ChatGPT for Productivity

• Mastering Excel through ChatGPT

• Becoming a Data Scientist using ChatGPT

• Data Analysis in PowerBI with ChatGPT

• Creating a Content Marketing Plan

• Social Media Marketing using ChatGPT

• Keyword Search and SEO using ChatGPT

• Generating Content using ChatGPT

• Implementing ChatGPT for Customer Service

• ChatGPT for Developers

• ChatGPT for Creating Programs

• ChatGPT for Debugging

• ChatGPT for Integrating New Features

• ChatGPT for Testing

• Documenting the Code with ChatGPT

Module 12: **Python with Generative AI (Self-paced)**

**Topics:**

• Python Code Generation with Generative AI

• Gen AI Tools for Coding

• Advanced Code Optimization with ChatGPT Gen AI Tool • Coding with ChatGPT

• Building an Application in Python with ChatGPT

Module 13: **Evaluating LLM Performance (Self-paced)**

**Topics:**

• LLM Performance Comparison

• Perplexity

• BLEU Score

• Human Evaluation

• Choosing the Right Metrics

• Interpreting the Results

Module 14: **Industry Case Studies and In-class Project (Self-paced)** Topics:

• In-class Project: AI-Powered Text and Image Generator

• Case Study: Generative AI for Personalized Learning

• Case Study: Generative AI for Creative Content Generation

• Case Study: Generative AI for Business

Module 15: **Bonus Module - Machine Learning with Generative AI (Self-paced)** Topics:

• Artificial Intelligence Essentials

• Disciplines of AI

• Types of AI

• Machine Learning Fundamentals

• Predictive ML Models

• ML Algorithms: Deep Dive

• Supervised Learning

• Unsupervised Learning

• Semi-Supervised Learning

• Reinforcement Learning

Module 16: **Bonus Module - Generative AI Tools (Self-paced)**

Topics:

• Hugging Face Transformers

• OpenAI GPT3 API

• Google Cloud AI Platform

• MidJourney

• DALL E- 2

• Google Bard