

# Microsoft AI Bootcamp for Freshers

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**Duration:** 96 hours

**Courseware:** Unofficial PPT/PDF + AI-900 Official Courseware + AI-102 Official Courseware

**Labs:** Koenig DC + AI-900 LOD + AI-102 LOD

**Course Objectives:**

- Develop foundational skills in Python and machine learning
  - Understand and apply Generative AI techniques with LLMs
  - Gain hands-on experience with text and image-based AI models
  - Implement AI solutions using Microsoft Azure Cognitive Services
  - Design and deploy scalable AI solutions on Azure
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## Module 01: Introduction to Python (12 hours)

- Introduction
- Data Types
- Variables
- Decision Control Files
- Operators
- List, Tuples, Sets, Dictionary
- Functions and Methods
- File Handling
- Module
- String
- Iterators and Generators
- Regular Expressions
- OO Programming Concepts
- NumPy
- Pandas

## Module 02: Machine Learning Essentials – 20 hours

- Machine Learning (ML) Overview
- Machine Learning Environment
- Machine Learning Concepts
- Feature Engineering (FE)
- Linear regression
- Logistic Regression
- Classification - SVM (Supervised Vector Machines)
- Classification - Decision Trees & Random Forests
- Classification - Naive Bayes

- Clustering (K-Means)
- Principal Component Analysis (PCA)
- Recommendation (Collaborative filtering)
- Natural Language Processing

### **Module 3: Generative AI Essentials – 24 hours**

#### **Module 3.1: Introduction of Generative AI**

- Introduction to Generative AI & its Architecture
- Introduction to Generative Adversarial Networks (GANs)
- Applications of Generative AI using Transformer Library
- Hands-on: Basic GenAI application creation using transformer library (Hugging face)

#### **Module 3.2: Working with Text Based Large Language Model**

- Architecture of Large Language Models
- Types of Large Language Models (LLMs)
- Hands-on: Task based Text AI LLMs – Translation, Summarization, Sentence Similarity, etc.
- Introduction to Ollama
- Hands-on: Consuming Major Text AI LLMs using Ollama (Qwen, Cohere, Falcon, LLama)
- Role based prompting of LLMs using Ollama
- Hands-on: Applying role-based prompting & Consuming LLMs using Ollama (Llama)

#### **Module 3.3: Working with Image Based Large Language Models**

- Image AI Models & Services
- Hands-On: Performing multiple tasks using LLMs (Object Detection, Image Segmentation, Image Retrieval, Image Captioning, Visual QnA, Zero-shot Image Classification)

#### **Module 3.4: Fine-tuning LLMs (Quantization) using Open Source Models**

- Introduction to Quantization
- Optimization of model weights (data types)
- Modes of Quantization
- Hands-on: Fine tuning Llama model

#### **Module 3.5: Basic LLM Systems (RAG) using Large Language Models**

- Introduction to Retrieval Augmented Generation (RAG)
- Introduction to LangChain
- Concept of Embedding, Retrieval, Chain and Agents using LangChain
- Lab: Build a Simple LLM Application using LangChain
- Lab: Build a Chatbot LangChain

### **Module 4: AI-900 Microsoft Azure AI Fundamentals – 08 hours**

- Implement Computer Vision Solutions using User Interface
- Implement Natural Language Processing Solutions using User Interface
- Implement Knowledge Mining Solutions using User Interface
- Implement Generative AI Solutions using User Interface

**Module 5: Designing and implementing a Microsoft Azure AI Solution – 32 hours**

- Plan and Manage an Azure Cognitive Services Solution
- Implement Computer Vision Solutions
- Implement Natural Language Processing Solutions
- Implement Knowledge Mining Solutions
- Implement Generative AI Solutions