# Microsoft AI Bootcamp for Freshers

## Course Duration: 96 Hours

## Overview

The Microsoft AI Bootcamp for Freshers is an immersive course designed to introduce newcomers to the fundamentals of artificial intelligence and machine learning, with a special focus on Microsoft AI technologies. Throughout the program, participants will gain hands-on experience with Microsoft Artificial Intelligence platforms and tools. Module 1 lays the groundwork with Python programming, covering everything from basic syntax and control structures to advanced topics like Object-oriented programming and data manipulation with libraries such as NumPy and Pandas. Module 2 delves into Machine Learning Essentials, equipping learners with knowledge on a variety of algorithms and data processing techniques. Module 3 introduces the basics of Microsoft Azure, while Module 4 and 5 dive deeper into the specific AI capabilities of Azure, teaching students how to design and implement AI solutions using Azure's cognitive services. By the end of the bootcamp, participants will be well-versed in Microsoft AI and ready to tackle real-world AI challenges.

## Audience Profile

The Microsoft AI Bootcamp for Freshers is designed to equip new entrants with foundational skills in Python, Machine Learning, and Azure AI.

- The bootcamp is ideal for:
- Recent graduates with a degree in computer science or related fields
- Aspiring data scientists and machine learning enthusiasts
- Junior software developers looking to specialize in AI
- IT professionals transitioning into AI and machine learning roles
- Freshers interested in developing AI solutions on the Microsoft Azure platform
- Technical professionals seeking to understand the basics of cloud services for AI
- Career changers aiming to enter the tech industry with a focus on artificial intelligence
- Non-technical professionals with a strong analytical background who aspire to gain technical AI skills • Final-year college students looking to enhance their employability with AI expertise

## Course Syllabus

### Module 01: Introduction to Python (12 hours)

- Introduction
- Data Types
- Variables
- Decision Control Structures
- Operators
- Lists, Tuples, Sets, and Dictionaries

- Functions and Methods
- File Handling
- Modules
- Strings
- Iterators and Generators
- Regular Expressions
- Object-Oriented Programming (OOP) Concepts
- NumPy
- Pandas

## Module 02: Machine Learning Essentials (20 hours)

- Overview of Machine Learning (ML)
- Machine Learning Environment Setup
- Core Machine Learning Concepts
- Feature Engineering (FE)
- Linear Regression
- Logistic Regression
- Classification: Support Vector Machines (SVM)
- Classification: Decision Trees & Random Forests
- Classification: Naïve Bayes
- Clustering (K-Means)
- Principal Component Analysis (PCA)
- Recommendation Systems (Collaborative Filtering)
- Natural Language Processing (NLP)

## Module 03: Generative AI Essentials (24 hours) Module

### 3.1: Introduction to Generative AI

- Overview of Generative AI & Its Architecture
- Introduction to Generative Adversarial Networks (GANs)
- Applications of Generative AI Using the Transformer Library
- Hands-on: Creating a Basic GenAI Application Using the Transformer Library (Hugging Face)

### Module 3.2: Working with Text-Based Large Language Models (LLMs)

- 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 for LLMs Using Ollama

- Hands-on: Applying Role-Based Prompting & Consuming LLMs Using Ollama (LLaMA)

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

- Overview of Image AI Models & Services
- Hands-on: Performing Multiple Tasks Using LLMs (Object Detection, Image Segmentation, Image Retrieval, Image Captioning, Visual Q&A, 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 the LLaMA Model

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

- Introduction to Retrieval-Augmented Generation (RAG)
- Introduction to LangChain
- Concepts of Embedding, Retrieval, Chains, and Agents Using LangChain
- Lab: Building a Simple LLM Application Using LangChain
- Lab: Building a Chatbot Using LangChain

## Module 04: AI-900 – Microsoft Azure AI Fundamentals (8 hours)

- Implementing Computer Vision Solutions Using the User Interface
- Implementing Natural Language Processing Solutions Using the User Interface
- Implementing Knowledge Mining Solutions Using the User Interface
- Implementing Generative AI Solutions Using the User Interface

## Module 05: Designing and Implementing a Microsoft Azure AI Solution (32 hours)

- Planning and Managing an Azure Cognitive Services Solution
- Implementing Computer Vision Solutions
- Implementing Natural Language Processing Solutions
- Implementing Knowledge Mining Solutions
- Implementing Generative AI Solutions