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Artificial Intelligence (AI) Training Curriculum Online by Certified Consultant

Module 1: Introduction to Artificial Intelligence

- What is Artificial Intelligence?
- History and Evolution of AI
- Types of AI (Narrow AI, General AI, Super AI)
- AI vs Machine Learning vs Deep Learning
- Applications of AI Across Industries
- AI Trends and Future Scope
- Ethical Considerations in AI

Module 2: Python Programming for AI

- Introduction to Python
- Variables and Data Types
- Operators and Expressions
- Conditional Statements
- Loops and Iterations
- Functions and Modules
- Object-Oriented Programming (OOP)
- File Handling
- Exception Handling
- Python Libraries for AI

Module 3: Mathematics for AI

- Linear Algebra Fundamentals
- Matrices and Vectors
- Probability and Statistics
- Descriptive Statistics
- Inferential Statistics
- Calculus Basics
- Optimization Techniques
- Data Visualization Concepts



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Module 4: Data Science Fundamentals

- Data Collection Methods
- Data Cleaning and Preprocessing
- Data Exploration
- Exploratory Data Analysis (EDA)
- Feature Engineering
- Data Transformation Techniques
- Handling Missing Data
- Data Visualization

Module 5: Machine Learning Fundamentals

- Introduction to Machine Learning
- Supervised Learning
- Unsupervised Learning
- Reinforcement Learning
- Training and Testing Datasets
- Model Evaluation Techniques
- Overfitting and Underfitting
- Cross Validation

Module 6: Supervised Learning Algorithms

- Linear Regression
- Logistic Regression
- Decision Trees
- Random Forest
- Support Vector Machines (SVM)
- K-Nearest Neighbors (KNN)
- Naive Bayes
- Ensemble Learning Techniques

Module 7: Unsupervised Learning Algorithms

- Clustering Concepts
- K-Means Clustering
- Hierarchical Clustering
- DBSCAN
- Dimensionality Reduction
- Principal Component Analysis (PCA)



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- Association Rule Mining

Module 8: Deep Learning Fundamentals

- Introduction to Neural Networks
- Perceptrons
- Activation Functions
- Forward and Backpropagation
- Gradient Descent
- Deep Neural Networks (DNN)
- Model Training and Optimization

Module 9: Deep Learning with TensorFlow & Keras

- Introduction to TensorFlow
- Introduction to Keras
- Building Neural Network Models
- Model Compilation and Training
- Hyperparameter Tuning
- Model Evaluation
- Saving and Deploying Models

Module 10: Computer Vision

- Introduction to Computer Vision
- Image Processing Basics
- OpenCV Fundamentals
- Convolutional Neural Networks (CNN)
- Image Classification
- Object Detection
- Face Recognition
- Image Segmentation

Module 11: Natural Language Processing (NLP)

- Introduction to NLP
- Text Processing Techniques
- Tokenization
- Stemming and Lemmatization
- Sentiment Analysis



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- Text Classification
- Named Entity Recognition (NER)
- Language Models

Module 12: Generative AI and Large Language Models

- Introduction to Generative AI
- Foundation Models
- Large Language Models (LLMs)
- Prompt Engineering
- Retrieval-Augmented Generation (RAG)
- AI Chatbots and Virtual Assistants
- Fine-Tuning Concepts
- AI Content Generation

Module 13: AI Frameworks and Libraries

- NumPy
- Pandas
- Matplotlib
- Scikit-Learn
- TensorFlow
- Keras
- PyTorch
- OpenCV
- Hugging Face Transformers

Module 14: Reinforcement Learning

- Reinforcement Learning Concepts
- Agents and Environments
- Rewards and Policies
- Markov Decision Processes
- Q-Learning
- Deep Reinforcement Learning
- Real-World Applications

Module 15: MLOps and AI Deployment

- Introduction to MLOps



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- Model Versioning
- Model Monitoring
- CI/CD for Machine Learning
- Docker for AI Applications
- Kubernetes Basics
- Model Deployment Strategies
- API Development for AI Models

Module 16: Cloud AI Services

- AI on Cloud Platforms
- AI Services in Microsoft Azure
- AI Services in AWS
- AI Services in Google Cloud Platform (GCP)
- Model Hosting
- Scalable AI Solutions

Module 17: Responsible AI and Ethics

- AI Governance
- Explainable AI (XAI)
- Bias and Fairness
- Data Privacy
- Security in AI Systems
- Regulatory Compliance
- Responsible AI Development

Module 18: AI Project Development

- Problem Definition
- Data Collection
- Data Preparation
- Model Selection
- Model Training
- Evaluation and Optimization
- Deployment
- Documentation

Module 19: Industry Use Cases



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- AI in Healthcare
- AI in Finance
- AI in Retail and E-commerce
- AI in Manufacturing
- AI in Human Resources
- AI in Marketing
- AI in Cybersecurity
- AI in Education

Module 20: Capstone Projects

- AI-Powered Chatbot Development
- Customer Sentiment Analysis System
- Resume Screening Application
- Image Classification Project
- Recommendation System
- Fraud Detection Solution
- Predictive Analytics Project
- End-to-End Generative AI Application

Hands-On Projects

Project 1: AI Chatbot

- Prompt Engineering
- LLM Integration
- Conversation Management

Project 2: Customer Sentiment Analysis

- NLP Techniques
- Text Classification
- Dashboard Reporting

Project 3: Image Recognition System

- CNN Development
- Model Training
- Real-Time Prediction

Project 4: Recommendation Engine



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- Collaborative Filtering
- Content-Based Recommendations
- Model Evaluation

Project 5: Generative AI Application

- RAG Implementation
- Knowledge Base Integration
- AI Assistant Deployment