

Faizan Digital Institute

"Empowering Students with Modern Digital Skills for a Bright Future"

Course Outline

Course Information

Course Title	Full Stack AI, ML with Data Analytics
Type	Advanced Certification Course
Class Schedule	4 Days Per Week
Duration	4 Months (64 Days / 16 Lectures)
Eligibility	Students & Beginners Interested in AI, Machine Learning, Data Analytics & Freelancing

Course Description

This practical-based Full Stack AI, ML with Data Analytics course is specially designed for students who want to build a successful career in the AI and Data industry. The course focuses on modern AI development through 100% hands-on training and live project work, covering No-Code AI SaaS development, Chatbots & Agentic AI systems, Data Science & Analytics, Machine Learning & Deep Learning, and Freelancing & Client Hunting. Students will learn to build, automate, analyze, and deploy real AI-powered applications using industry-standard tools and technologies. By the end of the course, students will be able to develop complete AI/ML solutions and work confidently on freelance and professional projects.

Program Learning Outcomes (PLO)

Program Learning Outcome	Description
PLO1 No-Code AI SaaS Development Expertise	Design and build functional AI-powered applications using modern no-code and AI-assisted development tools.
PLO2 Agentic AI & Automation Systems	Develop chatbots, AI agents, and automated workflows using industry-standard conversational AI and automation platforms.
PLO3 Data Science & Analytical Proficiency	Analyze, clean, visualize, and interpret data to support real-world, data-driven business decisions.
PLO4 Machine Learning & Deep Learning Mastery	Build, evaluate, and deploy robust, explainable machine learning and deep learning models.
PLO5 Career, Freelancing & Client Readiness	Build the professional skills required for freelancing, client acquisition, and successful careers in the AI/Data industry.

Course Objectives (CO)

This course assumes that students build, automate, and deploy real AI-powered applications. When students complete this course, they will be able to:

(CO)	Objective	PLO
CO1	Understand the fundamentals of AI, Machine Learning, and the architecture of modern full-stack AI development.	PLO1
CO2	Learn and implement core no-code, data science, and automation tools used across the AI industry.	PLO3
CO3	Design and develop intelligent, data-driven, and automated applications using industry-standard practices.	PLO2
CO4	Build real-world AI/ML projects and a professional portfolio to enhance freelancing and career readiness.	PLO5

Course Learning Outcomes (CLO)

At the end of this course, students will be able to:

No.	Outcome	Relation with PLO	BT Level	PLO Level
CLO1	Understand the fundamental concepts, architecture, and workflow of full-stack AI/ML development.	PLO1	C4	I
CLO2	Develop functional AI-powered applications and automated workflows using modern frameworks and platforms.	PLO2	C3	I

CLO3	Apply modern AI/ML tools, no-code platforms, and cloud/deployment services in practical projects.	PLO3	C2	I
CLO4	Analyze real-world problems and create intelligent, data-driven solutions through live project implementation.	PLO4	C4	I
CLO5	Demonstrate professional, freelancing, and client-acquisition skills through project-based learning activities.	PLO5	C3	I

Lecture type: Lectures, Lab Sessions

What Students Will Learn — Detailed Pillar Breakdown

PILLAR 1 · ~4 WEEKS

Data Science & Analytics

1. Introduction to Data Science

- 1.1 What is Data Science & Analytics
- 1.2 Role of Python in Data Science
- 1.3 Data Science Workflow Overview
- 1.4 Tools Overview: Pandas, NumPy, Tableau

2. Python for Data Analysis

- 2.1 Python Fundamentals Refresher
- 2.2 NumPy Arrays & Operations
- 2.3 Pandas Series & DataFrames
- 2.4 Data Cleaning Techniques
- 2.5 Handling Missing Values

3. Exploratory Data Analysis

- 3.1 Univariate & Bivariate Analysis
- 3.2 Outlier Detection
- 3.3 Correlation Analysis
- 3.4 Data Visualization with Matplotlib/Seaborn

4. Business Analytics & Tableau

- 4.1 Introduction to Tableau
- 4.2 Building Interactive Dashboards
- 4.3 KPI Visualization
- 4.4 Business Storytelling with Data

5. SQL for Data Analysis

- 5.1 SQL Basics
- 5.2 Querying & Filtering Data
- 5.3 Joins & Aggregations

6. Projects

- 6.1 Sales Performance Dashboard (Tableau)
- 6.2 EDA & Insights Report
- 6.3 KPI Dashboard for a Mock Company

Machine Learning & Deep Learning

1. ML Fundamentals

- 1.1 Supervised vs Unsupervised Learning
- 1.2 Traditional Programming vs Machine Learning
- 1.3 ML Project Lifecycle

2. Data Preprocessing & Feature Engineering

- 2.1 Encoding Categorical Variables
- 2.2 Feature Scaling
- 2.3 Train-Test Split & Cross-Validation

3. Regression & Classification

- 3.1 Linear & Polynomial Regression
- 3.2 Logistic Regression
- 3.3 Decision Trees & KNN
- 3.4 Support Vector Machines

4. Model Evaluation

- 4.1 Confusion Matrix
- 4.2 Accuracy, Precision, Recall, F1-Score
- 4.3 Cross-Validation Techniques

5. Advanced ML Techniques

- 5.1 Handling Imbalanced Data (SMOTE)
- 5.2 Ensemble Methods (Random Forest, XGBoost)
- 5.3 Clustering (K-Means)
- 5.4 Explainable AI (SHAP)

6. Deep Learning

- 6.1 Neural Network Basics
- 6.2 Introduction to TensorFlow / PyTorch
- 6.3 Building a Simple Neural Network
- 6.4 Image Classification Basics

7. Model Deployment

- 7.1 Saving & Loading Models
- 7.2 Introduction to FastAPI
- 7.3 Deploying ML Models as APIs

8. Projects

- 8.1 House Price Prediction

8.2 Titanic Survival Prediction

8.3 Loan Approval Predictor with SHAP

8.4 Customer Segmentation

8.5 Fake News Detection (NLP + SHAP)

8.6 Image Classification Neural Network

8.7 Deployed ML Model API

PILLAR 3 · ~4 WEEKS

No-Code AI SaaS Development

1. No-Code Development Foundations

- 1.1 What is No-Code Development
- 1.2 No-Code vs Traditional Development
- 1.3 When to Use No-Code Tools

2. Building with Bolt.new & Lovable

- 2.1 Prompt-Based App Generation
- 2.2 Designing UI with AI Prompts
- 2.3 Iterating on Generated Apps

3. AI-Assisted Coding with Cursor

- 3.1 Introduction to Cursor
- 3.2 AI Pair Programming Basics
- 3.3 Editing & Debugging with AI Assistance

4. No-Code Backend Development

- 4.1 Introduction to Xano
- 4.2 Building APIs without Code
- 4.3 Introduction to Supabase
- 4.4 Authentication & Database Setup

5. Connecting Frontend & Backend

- 5.1 Linking No-Code Apps to Backend Services
- 5.2 Testing End-to-End Functionality

6. Deployment & Hosting

- 6.1 Publishing a Live No-Code App
- 6.2 Custom Domains & Basics of Hosting

7. Projects

- 7.1 SaaS Landing Page + Waitlist App
- 7.2 CRUD App with Xano/Supabase Backend
- 7.3 Mini MVP Project (Booking / Feedback Tool)

PILLAR 4 • ~5 WEEKS

Chatbots & Agentic AI Systems

1. Foundations of Conversational AI

- 1.1 Chatbots vs Agentic AI
- 1.2 How Large Language Models Work (Conceptual)
- 1.3 Prompt Engineering Basics

2. Building Chatbots

- 2.1 Introduction to Dialogflow
- 2.2 Designing Conversation Flows
- 2.3 OpenAI / ChatGPT API Basics
- 2.4 Google Gemini API Basics

3. Workflow Automation with N8N

- 3.1 Introduction to N8N
- 3.2 Connecting Apps & APIs
- 3.3 Building Automated Workflows

4. Agentic AI with CrewAI

- 4.1 Introduction to Multi-Agent Systems
- 4.2 Defining Agent Roles & Tasks
- 4.3 Coordinating Multiple Agents

5. Retrieval-Augmented Generation (RAG)

- 5.1 Introduction to RAG
- 5.2 Connecting AI to Documents / Knowledge Bases
- 5.3 Building a Simple RAG Q&A Bot

6. Responsible AI Basics

- 6.1 Guardrails & Limitations of AI Agents
- 6.2 Ethical Considerations

7. Projects

- 7.1 Customer Support Chatbot
- 7.2 Automated Workflow with N8N
- 7.3 Multi-Agent System with CrewAI
- 7.4 RAG-Based Document Q&A Bot

PILLAR 5 · ~2 WEEKS + ONGOING

Freelancing & Client Hunting

1. Building a Professional Portfolio

- 1.1 GitHub Portfolio Essentials
- 1.2 Writing Clean READMEs
- 1.3 Organizing Project Repositories

2. Freelance Platform Setup

- 2.1 Setting Up Fiverr Profile
- 2.2 Setting Up Upwork Profile
- 2.3 Gig & Proposal Writing

3. Client Communication & Pricing

- 3.1 Writing Winning Proposals
- 3.2 Pricing Your Services
- 3.3 Client Communication Best Practices

4. Business Automation for Freelancers

- 4.1 Introduction to Zapier
- 4.2 Automating Repetitive Tasks
- 4.3 Introduction to Stripe
- 4.4 Accepting Payments as a Freelancer

5. Personal Branding

- 5.1 LinkedIn Branding for AI/Data Professionals
- 5.2 Sharing Projects Publicly

6. Projects / Deliverables

- 6.1 Published Fiverr Gig
- 6.2 3 Real Proposals for Job Postings
- 6.3 One End-to-End Zapier Automation
- 6.4 Portfolio Website (Built with No-Code Tools)

Final Advanced Projects

Sr	Project Category	High-Class Projects
1	Data Science & Analytics	Sales Performance Dashboard, EDA & Insights Report, KPI Dashboard for a Mock Company
2	Machine Learning Projects	House Price Prediction, Titanic Survival Prediction, Loan Approval Predictor with SHAP, Customer Segmentation
3	Deep Learning & NLP Projects	Fake News Detection (NLP + SHAP), Image Classification Neural Network
4	No-Code AI SaaS Projects	SaaS Landing Page + Waitlist App, CRUD App with Xano/Supabase, Mini MVP Project
5	Chatbots & Agentic AI Projects	Customer Support Chatbot, N8N Automated Workflow, CrewAI Multi-Agent System, RAG Document Q&A Bot
6	Deployment Projects	Deployed ML Model API (FastAPI), Live No-Code App Hosting
7	Freelancing Deliverables	Published Fiverr Gig, Real Client Proposals, Zapier Automation, Portfolio Website
8	Final Advanced Capstone Projects	2 Production-Level End-to-End AI/ML Applications combining No-Code, Agentic AI, ML & Deployment

Final Advanced Project Options

- AI-Powered SaaS Product (No-Code Frontend + ML Backend)
- Multi-Agent Customer Support System (CrewAI + RAG)
- End-to-End ML Model with Explainability Dashboard (SHAP)
- Automated Business Intelligence Dashboard (Tableau + Python)
- Freelance-Ready AI Portfolio Website with Live Projects
- AI Chatbot with Payment Integration (Stripe)
- Full-Stack Data Analytics + ML SaaS Application

THANK YOU!