Transftech ACADEMY

Full Stack AI Driven Data Analytics program

COURSE CURRICULUM

Learning Roadmap

1. Data Foundations & Ecosystem
2. Advanced Excel for Analytics
3. Database Management & SQL
4. Python Programming (Beginner → Intermediate)
5. Pandas, NumPy & ETL Pipelines
6. Data Visualization (Matplotlib, Seaborn, Plotly)
7. BI Dashboards (Tableau / Power BI)
8. Statistics, Math & Probability
9. Applied Machine Learning
10. Neural Networks & Deep Learning
11. Transformers & Modern DL Architectures
12. Generative AI & Prompt Engineering
13. LLM Fine-Tuning (LoRA, QLoRA, PEFT)
14. LangChain, RAG & Vector Databases
15. Big Data with PySpark
16. API Development & Full-Stack AI Apps
17. Docker, CI/CD & Deployment
18. Capstone Project + Demo Day + Career Prep

The Big Picture

The **Full Stack AI-Driven Data Analytics Bootcamp** by **Transfotech Academy** is built to transform beginners into job-ready Data & AI professionals.

You will learn the complete data lifecycle, from raw data collection to ML modeling, GenAI workflows, deployment, and full-stack analytics engineering.

Through hands-on labs, real datasets, interactive BI dashboards, machine learning systems, and end-to-end AI app development, you will gain practical experience that employers demand.
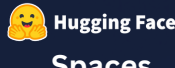
Career Paths You Can Pursue

- Data Analyst
- Business Intelligence (BI) Analyst
- Machine Learning (ML) Analyst
- Entry-Level Data Scientist
- AI Data Engineer
- RAG Pipeline Developer
- Full-Stack Analytics Engineer

Course Insights

- **Duration:** 5 Months
- **Live Classes:** 40 Sessions
- **Mode:** Instructor-Led + Hands-On Labs
- **Assignments:** Weekly, with real datasets
- **Capstone:** AI-Driven Data Project
- **Career Support:** Resume, GitHub, LinkedIn, Interview Prep
- **Tools Used:** Python, SQL, Tableau, Power BI, sklearn, TensorFlow, PyTorch, Hugging Face, LangChain, Docker, PySpark, FAISS, and more

Skills & Tools Mastery

Category	Skills & Tools
Programming & Data	EXCEL, SQL, python, pandas, NumPy
Visualization & BI	Matplotlib, seaborn, plotly, tableau, Power BI
Machine Learning & Deep Learning	Scikit-Learn, TensorFlow, Keras, PyTorch
Generative AI & LLMs	GPT-4, Claude, Gemini, Mistral, LLaMA, Prompt Engineering, LoRa, QLoRA, PEFT
Prompt Evaluation Tools	LangChain, Promptfoo, ragas, EvalLM
App Development & Deployment	Flask, gradio, Streamlit, docker, Render, Hugging Face Spaces
Big Data & Vector Databases	PySpark, FAISS, Chroma, Weaviate, Pinecone
Multimodal AI	Whisper, Stable Diffusion, bark, TTS APIs

CHAPTER 1: Data Foundations & Analytics Ecosystem

(Sessions 1–8)

Goal: Build foundational skills in data ecosystems, pipelines, and analytical tools.

Session 1: Data Foundations & Data Ecosystem

- What is a Data Ecosystem & Pipeline

- Data Types & Storytelling

- Advanced Excel (XLOOKUP, INDEX/MATCH, SUMIFS)

- Pivot Tables & Exploratory Charts

- Data Cleaning Fundamentals

Lab: Preprocess a real dataset using Excel

Assignment: Clean and wrangle a second dataset

Session 2: Database Management & SQL

- RDBMS, PostgreSQL/MySQL

- ER Diagrams, Data Modeling

- SQL for Analytics (Joins, CTEs, Window Functions)

Lab: Create relational tables; analytical queries

Assignment: Build & query a sales database

Session 3: Python Basics I

- What is AI?

- Setting up Python (Colab, VS Code)

- Syntax, Variables, Operators, Strings

Lab: "Hello AI World" + Calculator

Assignment: Personal Budget Calculator

Session 4: Python Basics II

- Loops, Conditionals, Functions
- Lists, Sets, Tuples, Dictionaries
- JSON handling

Lab: AI Decision Maker App

Assignment: Quiz Program + Movie Aggregator

Session 5: Pandas, NumPy & ETL Pipelines

- NumPy Arrays & Matrix Ops
- DataFrames, Merging, Cleaning
- Connecting Python to SQL
- ETL/ELT Fundamentals

Lab: Explore Sales Dataset

Assignment: Customer Insights Dashboard

Session 6: Data Visualization

- Matplotlib, Seaborn, Plotly
- Visual Storytelling Techniques

Lab: Product Sales Trend Visualization

Assignment: Data Story Notebook

Session 7: Tableau / Power BI

- Connecting Data
- Interactive Dashboards
- **Parameters, Drill-Downs**

Lab: BI Dashboard Build

Assignment: E-commerce Performance Report

Session 8: Statistics & Probability

- Linear Algebra for ML
- Variance, Standard Deviation
- Probability Distributions
- Covariance & Correlation

Lab: Regression visualization & correlation map

Assignment: Gradient Descent Demo + Dataset Analysis

CHAPTER 2: Machine Learning & Deep Learning

(Sessions 9–16)

Goal: Build predictive models, understand neural networks, and learn advanced DL architecture.

Session 9: Introduction to Machine Learning

- ML Types: Supervised, Unsupervised, RL
- ML Pipeline

Lab: Titanic Classifier

Assignment: ML Survival Prediction

Session 10: Regression Models

- Linear, Multiple Regression
- MSE, RMSE, R^2 Metrics

Lab: Housing Price Prediction

Assignment: Regression Project

Session 11: Classification Models

- Logistic Regression, Trees, Random Forest
- Precision, Recall, F1
- Train-Test Split, Cross-Validation

Lab: Customer Churn Model

Assignment: Model Comparison

Session 12: Clustering & Unsupervised Learning

- K-Means
- Hierarchical Clustering
- PCA

Lab: Customer Segmentation

Assignment: Market Segmentation Report

Session 13: Neural Networks

- Neurons, Perceptrons
- Activation Functions
- Backpropagation

Lab: NN with NumPy

Assignment: Visualize 2-Layer Network

Session 14: Deep Learning with TensorFlow & Keras

- Model Building
- CNN Image Classification

Lab: MNIST CNN

Assignment: CNN Analysis

Session 15: PyTorch for Deep Learning

- Tensors, DataLoader
- Training Loop

Lab: Binary Classifier

Assignment: Convert Keras Model to PyTorch

Session 16: Advanced Architectures (CNNs, RNNs, Transformers)

- CNNs for Vision
- RNNs for NLP/Time Series
- Intro to Transformers

Lab: LSTM vs Transformer

Assignment: Architecture Comparison

CHAPTER 3: Generative AI & LLM Systems

(Sessions 17–26)

Goal: Master prompt engineering, LLM workflows, evaluation, and model adaptation.

Session 17: Generative AI Landscape

- GPT, Claude, Mistral, LLaMA

- Industry Use Cases

Lab: Compare LLM Outputs

Assignment: AI Across Industries

Session 18: Prompt Engineering Fundamentals

- Prompt Patterns: CoT, ReAct, Persona

- Role + Context + Instructions

Lab: Business & Coding Prompts

Assignment: Fix Poor Prompts

Session 19: Prompt Optimization

- Zero/Few-Shot

- Chain-of-Thought

- Self-Refinement

Lab: CoT for Complex Reasoning

Assignment: Prompt Strategy Report

Session 20: Prompt Evaluation

- Metrics: Accuracy, Bias, Hallucination
- Tools: Promptfoo, Ragas, EvalLM

Lab: A/B Evaluation

Assignment: Prompt Evaluation Dashboard

Session 21: Fine-Tuning & PEFT

- Fine-Tuning vs Prompt-Tuning
- LoRA, QLoRA, PEFT Frameworks

Lab: Fine-Tune GPT-2 on Custom Text

Assignment: Build Support Chatbot

Session 22: Hugging Face Workflows

- Pipelines: Text Gen, Summarization
- Model Deployment

Lab: Summarizer Tool

Assignment: Explore 3 Models

Session 23: Multimodal AI

- Whisper, Bark, Stable Diffusion
- Audio + Text + Image Workflows

Lab: Voice-Controlled Chatbot

Assignment: Multimodal App Idea

Session 24: Responsible AI

- Ethics, Bias, Transparency
- Copyright & Safety

Lab: Identify Harmful Outputs

Assignment: Ethical AI Guidelines

Session 25–26: Applied GenAI Workshop

- Multi-Model Integration
- Prompt Chaining
- LLM APIs

Lab: Multi-Agent AI Assistant

Assignment: Portfolio Prompt Pack

CHAPTER 4: Full–Stack AI App Development

(Sessions 27–40)

Goal: Build & deploy complete end-to-end AI applications with modern tools.

Session 27–28: MLOps & Deployment

- Docker Basics

- CI/CD

- Hugging Face Spaces / Render Deployment

Lab: Containerize App

Assignment: Deployment + README

Session 29: APIs & Gradio

- Flask APIs

- REST Endpoints

- Gradio UI Prototyping

Lab: REST API + Gradio Interface

Assignment: API Documentation

Session 30: LangChain & RAG

- Chains, Tools, Memory

- RAG Architecture

Lab: RAG Study Assistant

Assignment: Custom RAG Pipeline

Session 31–32: Big Data & Vector Databases

- PySpark Basics

- Data Lake vs Warehouse

- Parquet/ORC Formats

- FAISS, Chroma, Weaviate

Lab: Document Q&A Bot

Assignment: Retriever Demo

Session 33–34: Full-Stack Integration

- Frontend + Backend + Model

- Session Memory

- Logging & Error Handling

Lab: Fully Integrated AI App

Assignment: MVP on GitHub

Session 35–40: Capstone & Career Prep

- End-to-End Capstone Build

- Data → ML → Deployment Pipeline

- Demo Day Presentation

- Resume + GitHub + LinkedIn Prep

- Interview Guidance

Final Deliverable:

A Portfolio-Ready Full-Stack AI Application

Who Are We?

Transfotech Academy is a leading IT training institute with over **12 years** of experience in preparing students for successful careers in the tech industry. As an **E-Verified** organization recognized by USCIS, we specialize in job-ready, industry-aligned training programs supported by lifetime career guidance. Founded by *Sheikh Galib Rahman*, Transfotech Academy operates as a core entity of **Shera International Group**, a U.S.-based education and technology organization.

Over the years, **we have trained more than 3,000 students, with over 60% successfully placed into competitive job roles across the United States and beyond.** Our programs are designed to meet both current market demands and future workforce needs, equipping students with hands-on experience, real-world projects, and mentorship from certified professionals. We are also affiliated with several accredited universities in the United States, expanding academic and career pathways for our learners.

With physical **offices located in New York and Los Angeles**, Transfotech Academy stands as a trusted bridge between education and employment—providing a robust foundation for students to thrive in today's rapidly evolving tech landscape.

Sheikh Galib Rahman
Founder & CEO

Fayek Chowdhury
Data Analyst | Technical Lead | SQL & Python | Data Quality & Automation | Analytics & Process Improvement
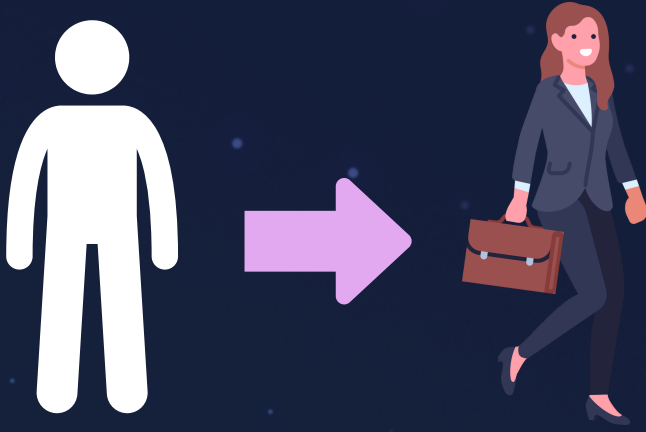
Fuad Bin Saif
Data Analyst, 6+ years experience in Data Analytics & Machine Learning

Why Choose Transfotech?

Data is transforming every industry, shaping how businesses operate, innovate, and make smarter decisions. Our *Full Stack AI Driven Data Analytics program* is designed to give you the complete skill set needed to thrive in this data-driven world, even if you are starting with no technical background. You will learn industry-standard tools to collect, clean, analyze, and visualize real datasets. At *Transfotech Academy*, we prepare professionals to lead with data. Now it is your turn to build real analytical impact for businesses and your career.

This is not just a course. It is your entry point into a data-powered future.

Our *Full Stack AI Driven Data Analytics program* gives you practical experience with real datasets, dashboards, and analytical tools used by top companies.

From cleaning and analyzing data to presenting insights that drive decisions, you will gain the skills employers value most.

Start today and build the data-driven career you deserve.

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