

AI & Data Science Course — Phase-Wise Project Plan

Phase 1: Python Programming Foundations

Lay the groundwork for strong programming logic, clean coding, and problem-solving with Python fundamentals.

-  **Expense Tracker CLI** – Build a console app to record daily expenses and generate monthly reports. (*Assignment Project*)
 -  **Student Record Management System** – Create an OOP-based system to store and manage student information. (*Class Project*)
 -  **Data Cleaning Automation Script** – Develop a Python utility that cleans and standardizes CSV data automatically. (*Assignment Project*)
 -  **Mini Text Adventure Game** – Design an interactive game using loops, conditionals, and random events. (*Assignment Project*)
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Phase 2: Web Development with Python

Learn how to create dynamic, data-driven web applications using Flask, Django, and REST APIs.

-  **Property Listing Web App** – Build a Flask web platform for browsing and filtering property listings. (*Class Project*)
-  **Smart Expense Tracker Web App** – Turn your CLI tracker into a full web app with charts and analytics. (*Assignment Project*)
-  **Stock Market Insight API** – Create a FastAPI service that serves live stock trends and price updates. (*Assignment Project*)

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-  **Mini Learning Management System (LMS)** – Develop a Django-based platform for managing online courses and learners. (*Class Project*)



Phase 3: Data Science & Visualization

Master data wrangling, analytics, and visualization to tell compelling business stories with data.

-  **Global Energy Consumption Dashboard** – Visualize renewable energy trends and CO₂ emissions worldwide. (*Class Project*)
 -  **E-Commerce Customer Behavior Analysis** – Analyze customer purchase patterns to discover top products and segments. (*Assignment Project*)
 -  **YouTube / Netflix Content Insights** – Explore streaming data to identify trending genres and viewer engagement. (*Assignment Project*)
 -  **HR Analytics Dashboard** – Investigate attrition, diversity, and workforce trends through rich visualizations. (*Class Project*)
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Phase 4: Machine Learning Applications

Apply machine learning to real-world business challenges, focusing on predictions, insights, and deployment.

-  **Customer Lifetime Value Prediction** – Predict the potential lifetime revenue of each customer. (*Class Project*)
-  **Loan Default Risk Predictor** – Build a FinTech model to evaluate borrower credit risk and deploy via FastAPI. (*Assignment Project*)
-  **Predictive Maintenance System** – Anticipate equipment failures using IoT and operational data. (*Assignment Project*)
-  **Sales Forecasting Dashboard** – Forecast product demand and sales using Prophet or ARIMA models. (*Assignment Project*)

-  **AI Resume Screening System** – Implement an ML model to rank resumes and assist recruiters in candidate selection. (*Class Project*)
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Phase 5: Deep Learning & Neural Networks

Dive into advanced AI concepts like computer vision and natural language processing, emphasizing deployable models.

-  **Face Mask Detection System** – Train a CNN to detect mask compliance from live camera feeds. (*Class Project*)
 -  **Retail Product Image Classifier** – Fine-tune ResNet or MobileNet to classify retail products by image. (*Assignment Project*)
 -  **Real-Time Sign Language Translator** – Use CNN + MediaPipe to translate sign language gestures into text. (*Assignment Project*)
 -  **Customer Review Sentiment Analyzer (BERT)** – Fine-tune BERT to analyze and visualize customer sentiments. (*Assignment Project*)
 -  **AI-Powered Document Classifier** – Combine OCR and NLP to categorize documents like invoices and contracts. (*Class Project*)
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Phase 6: Model Deployment & MLOps

Learn to operationalize AI models through APIs, dashboards, and automated pipelines.

-  **ML Model Deployment API** – Deploy trained models as RESTful APIs using FastAPI and Uvicorn. (*Class Project*)
 -  **End-to-End AI Pipeline** – Build a Dockerized workflow for data ingestion, training, and real-time inference. (*Assignment Project*)
 -  **Model Monitoring Dashboard** – Create a live dashboard to track performance and drift of deployed models. (*Assignment Project*)
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Phase 7: Generative AI & Agentic AI

Step into the future of AI — building intelligent, context-aware, and autonomous systems powered by LLMs and agents.

- **AI Resume Screener (LLM)** – Use LLMs and vector databases to match candidates to job roles intelligently. (*Class Project*)
- **Business Insights Agent** – Develop an agent that analyzes datasets and answers analytical questions conversationally. (*Assignment Project*)
- **AI Content Generator for Marketing** – Create an AI assistant that writes marketing copy and product descriptions. (*Assignment Project*)
- **RAG-Powered Chatbot** – Implement a chatbot that retrieves accurate answers from a private knowledge base. (*Class Project*)
- **Autonomous Data Analysis Agent** – Build an agentic AI capable of performing end-to-end data analysis automatically. (*Capstone Project*)