

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)*

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