3-Month Course Schedule: Python, ML & Generative AI

Course Schedule

Week	Day	Topic
Week 1	Day 1	Python intro & setup (Jupyter, VSCode, Anaconda)
	Day 2	Data types, variables, list Comprehensions
	Day 3	Conditionals & loops, file handling
	Day 4	Functions and lambda , args and kwargs
	Day 5	Object-oriented programming in Python
Week 2	Day 6	File handling (read/write, text, JSON, CSV)
	Day 7	Error handling & logging
	Day 8	Python standard libraries (math, datetime, etc.)
	Day 9	NumPy arrays & operations
	Day 10	Indexing, slicing, broadcasting in NumPy
Week 3	Day 11	Pandas Series & DataFrames
	Day 12	DataFrame operations & filtering
	Day 13	GroupBy, aggregation, merging, joins
	Day 14	Handling missing data, duplicates
	Day 15	Feature engineering basics & data type casting
Week 4	Day 16	Descriptive statistics & summary functions
	Day 17	Matplotlib basics (line, bar, scatter)
	Day 18	Seaborn basics (distributions, heatmaps)
	Day 19	Mini project: Data cleaning & EDA in Pandas
	Day 20	Summary & Quiz 1
Week 5	Day 21	ML overview & types
	Day 22	Train/test split, cross-validation, pipeline
	Day 23	Linear Regression
	Day 24	Metrics: RMSE, MAE, R^2
	Day 25	Mini project
Week 6	Day 26	Logistic Regression
	Day 27	Classification metrics: Precision, Recall, F1
	Day 28	K-Nearest Neighbors
	Day 29	Decision Trees

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	Day 30	Practice: Model comparison
Week 7	Day 31	Random Forests
	Day 32	Intro to Gradient Boosting (XGBoost)
	Day 33	SVM
	Day 34	Hyperparameter tuning: GridSearchCV
	Day 35	Mini project: Classification task
Week 8	Day 36	Model persistence: joblib, pickle
	Day 37	Serving ML model via API
	Day 38	Project
	Day 39	Project
	Day 40	Summary & Quiz 2
Week 9	Day 41	Introduction to LLM, transformer
	Day 42	Embeddings: what & why
	Day 43	Accessing all LLM APIs
	Day 44	LangChain
	Day 45	Introduction to vector databases
Week 10	Day 46	Mini project: Text similarity search
	Day 47	RAG from scratch (Techniques)
	Day 48	Prompts Techniques
	Day 49	Project 1
	Day 50	Project 1 (Cont)
Week 11	Day 51	AI Agents
	Day 52	Capstone project build (Day 1)
	Day 53	Capstone project build (Day 2)
	Day 54	Capstone project build (Day 3)
	Day 55	Capstone checkpoint & feedback
Week 12	Day 56	Final touch-ups
	Day 57	Project presentations (Team 1-2)
	Day 58	Project presentations (Team 3-4)
	Day 59	Advancements in Gen AI (AI Agents + MCP)
	Day 60	Discussion and Feedback