Data Analytics and Generative AI

1. Python for Data Analysis

Objective: Build strong programming fundamentals for analytics and AI.
Modules:
• Python basics
• Data types and control flow
• Functions and modules
• File handling
• Python for business tasks
Output: Clean Python scripts and mini projects

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2. Data Analytics Foundation

Objective: Develop core analytical skills using real datasets.
Modules:
• Statistics basics
• Probability concepts
• Data cleaning and preparation
• Exploratory data analysis
• Analytical problem solving
Output: Full EDA report

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3. Data Handling with Pandas and NumPy

Objective: Master essential libraries for analytics and AI pipelines.
Modules:
• DataFrames and Series
• Merging, grouping, pivoting
• Numerical operations
• Time series basics
• Data transformation techniques
Output: Data transformation notebook

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4. Data Visualization

Objective: Learn to convert raw insights into visual stories.
Modules:
• Matplotlib fundamentals
• Seaborn for statistical plots
• Business storytelling dashboards
• Trend and pattern analysis
Output: Dashboard with 6 to 8 visual charts

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5. SQL for Analytics

Objective: Develop strong data querying skills.
Modules:
• Joins, filters and aggregations
• Window functions
• Subqueries
• Analytical queries
Output: SQL analysis report

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6. Machine Learning Essentials

Objective: Build prediction and classification models.
Modules:
• Supervised and unsupervised learning
• Linear and logistic regression
• Decision trees and clustering
• Model evaluation and metrics
Output: ML prediction model

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7. Generative AI Fundamentals

Objective: Understand the core concepts of generative models.
Modules:
• What Generative AI is
• LLM fundamentals
• Tokens, embeddings
• Prompt engineering basics
Output: Prompt engineering workbook

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8. Applied Generative AI Tools

Objective: Use real AI tools in business environments.
Modules:
• ChatGPT automation
• AI workflows in marketing and product
• Image generation systems
• Text, code and data generation
Output: AI automation use case

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9. Python with AI Libraries

Objective: Use Python to run AI tasks.
Modules:
• Transformers library basics
• LangChain workflows
• Using open source LLMs
• Embedding generation
Output: Python AI pipeline

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10. Capstone Project: Data Analytics plus Generative AI

Objective: Combine analytics, Python and AI to build a complete solution.
Suggested Projects:
• AI powered business insights dashboard
• Automated data analysis bot
• Chatbot trained on custom company data
Output: One full project with documentation