COMPLETE MASTER PROGRAM

DATA SCIENCE, MACHINE LEARNING & DEEP LEARNING

From Data to Intelligence – Analyze, Model & Predict

TOOLS & TECHNOLOGIES

Python	SQL	Jupyter	Pandas	NumPy
Matplotlib	Seaborn	Scikit-learn	TensorFlow	PyTorch

DURATION	GUIDED HOURS	WHO CAN JOIN?
4 Months	240 Hours	Students, graduates and working professionals (Beginner to Advanced)

PROGRAM APPROACH

Build skills progressively through SQL, Python, statistics, data visualization, machine learning, deep learning, AI, data engineering, model evaluation and a practical capstone project.

CAREER LAUNCHPAD

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MODULE 01 | 20 Hours | Weeks 1–2
SQL for Data Analysis

MODULE OVERVIEW
Build a strong foundation in SQL to work with real-world data.

TOPICS COVERED

- SQL basics and query writing
- Joins, subqueries and set operations
- Aggregation and window functions
- Data manipulation (DML)
- Working with real datasets

REAL-WORLD EXAMPLE
Analyze sales, customer and business data using SQL.

PRACTICE PROJECT
Write SQL queries to solve business use cases.

MODULE 02 | 24 Hours | Weeks 3–4
Python for Data Science

MODULE OVERVIEW
Learn Python programming for data analysis and data science.

TOPICS COVERED

- Python basics and data types
- Working with NumPy and Pandas
- Data cleaning and transformation
- Data analysis and manipulation
- Data visualization (Matplotlib & Seaborn)

REAL-WORLD EXAMPLE
Clean and prepare real business data (e.g., sales, marketing).

PRACTICE PROJECT
Perform end-to-end data analysis using Python.

MODULE 03 | 20 Hours | Weeks 5–6
Statistics for Data Science

MODULE OVERVIEW
Understand key statistical concepts and apply them for data analysis and modeling.

TOPICS COVERED

- Descriptive statistics
- Probability and distributions
- Inferential statistics
- Hypothesis testing (t-test, ANOVA)
- Confidence interval
- Correlation and regression analysis

REAL-WORLD EXAMPLE
Analyze A/B test results for business decision making.

PRACTICE PROJECT
Perform statistical analysis and interpret the results.

MODULE 04 | 20 Hours | Weeks 7–8
Data Analysis & Visualization

MODULE OVERVIEW
Turn raw data into meaningful insights using analysis and visualization.

TOPICS COVERED

- Exploratory Data Analysis (EDA)
- Data visualization best practices
- Interactive dashboards (Power BI / Tableau)
- Insight generation and storytelling

REAL-WORLD EXAMPLE
Build a business dashboard for sales and performance tracking.

PRACTICE PROJECT
Create an interactive dashboard with real-world data.

MODULE 05 | 30 Hours | Weeks 9–10
Machine Learning Fundamentals

MODULE OVERVIEW
Learn core ML concepts and build predictive models on real datasets.

TOPICS COVERED

- ML workflow and problem types
- Data preprocessing and feature engineering
- Supervised learning (Regression, Classification)
- Unsupervised learning (Clustering, PCA)
- Model evaluation (Accuracy, Precision, Recall, F1)

REAL-WORLD EXAMPLE
Customer churn prediction / customer segmentation.

PRACTICE PROJECT
Build and evaluate ML models using real datasets.

MODULE 06 | 24 Hours | Weeks 11–12
Advanced Machine Learning

MODULE OVERVIEW
Go deeper into advanced ML techniques and model optimization.

TOPICS COVERED

- Ensemble methods (Random Forest, XGBoost, LightGBM)
- Hyperparameter tuning and optimization
- Feature selection and model interpretation (SHAP)
- Imbalanced data handling
- Time series forecasting

REAL-WORLD EXAMPLE
Sales or demand forecasting using time series data.

PRACTICE PROJECT
Build an end-to-end model with tuning and interpretation.

MODULE 07 | 28 Hours | Weeks 13–14
Deep Learning

MODULE OVERVIEW
Learn deep learning concepts and build neural network models for real use cases.

TOPICS COVERED

- Neural networks and backpropagation
- Deep learning architectures (CNN, RNN, LSTM)
- Computer vision (image classification)
- NLP basics (text classification)
- Model training, tuning and evaluation

REAL-WORLD EXAMPLE
Image classification or sentiment analysis model.

PRACTICE PROJECT
Train and evaluate a deep learning model using real data.

MODULE 08 | 16 Hours | Week 15
Introduction to Artificial Intelligence

MODULE OVERVIEW
Get a foundational understanding of AI and its role in modern applications.

TOPICS COVERED

- What is AI and how it differs from ML
- Key AI concepts (search, reasoning, knowledge, learning)
- Real-world applications of AI
- AI trends and opportunities

REAL-WORLD EXAMPLE
Explore real-world AI use cases in healthcare, retail and finance.

PRACTICE PROJECT
Analyze and present an AI use case for a business domain.

MODULE 09 | 20 Hours | Week 16
Data Engineering for Data Science

MODULE OVERVIEW
Prepare, manage and build reliable data pipelines for ML and DL projects.

TOPICS COVERED

- Data ingestion, cleaning and transformation
- Working with structured and unstructured data
- ETL / ELT with Python (Pandas)
- Data pipeline design (batch and incremental)
- Data quality and best practices

REAL-WORLD EXAMPLE
Build a data pipeline to prepare model-ready data.

PRACTICE PROJECT
Create an end-to-end data preparation pipeline using Python.

MODULE 10 | 20 Hours | Week 17
Model Evaluation & Responsible AI

MODULE OVERVIEW
Ensure model performance, reliability and responsible use of ML/DL models.

TOPICS COVERED

- Model evaluation metrics (Regression, Classification, DL)
- Cross-validation and error analysis
- Bias, fairness and responsible AI (basics)
- Model interpretability (SHAP, feature importance)
- Model monitoring (concepts)

REAL-WORLD EXAMPLE
Evaluate and interpret a model for real business data.

PRACTICE PROJECT
Create a model evaluation and interpretability report.

MODULE 11 | 18 Hours | Weeks 18–19
Capstone Project & Career Preparation

MODULE OVERVIEW
Apply all the learned concepts to build a complete end-to-end Data Science / ML / DL solution and get career-ready.

TOPICS COVERED

- Real-world problem definition and solution design
- End-to-end data pipeline (data → model → insights)
- Model evaluation and business impact analysis
- Solution presentation with business use case
- Resume building, mock interviews and career guidance

REAL-WORLD EXAMPLE
A complete business solution (e.g., demand forecasting, churn prediction, or image classification).

PRACTICE PROJECT
Design, build and present a complete Data Science / ML / DL solution with code, documentation and demo.

KEY LEARNING OUTCOMES & CAREER OPPORTUNITIES

KEY LEARNING OUTCOMES

- ✓ Analyze, clean and prepare real-world data
- ✓ Apply statistical concepts for data analysis
- ✓ Build and evaluate ML and DL models
- ✓ Work with real datasets and business use cases
- ✓ Understand core AI concepts and modern AI trends
- ✓ Create a strong project portfolio for career growth

CAREER OPPORTUNITIES

➤ **Data Scientist**	➤ **Data Analyst (Advanced)**
➤ **Machine Learning Engineer**	➤ **Business Analyst (Analytics)**
➤ **Deep Learning Engineer**	➤ **Analytics Engineer**
➤ **AI/ML Analyst**	➤ **Data Engineer**

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