

Machine Learning to Generative AI: The Placement Blueprint

*A comprehensive From-Scratch Masterclass for starting a career
in Data Science.*

What to Expect

This program bridges the gap between academic theory and industry reality. We prioritize **business problem scenarios over technical jargon**, ensuring you intuitively understand the *why* before the math.

Our proven pedagogical methodology includes:

- **Business-First Approach:** Every concept is introduced by stating the business problem it solves.
- **The A-I-O-M-E Framework:** Master complex algorithms through structured learning steps: Architecture, Intuition, Optimization, Math, and Evaluation.
- **Multiple Hands-on Projects:** Apply your knowledge directly by building an EDA mini-project, a mid-term predictive model, and a fully deployed Generative AI final capstone.

Prerequisites

Absolutely Zero Coding Experience Required!

This course is built from the ground up. Whether you are a fresh college graduate looking to enter the tech industry or a mid-career professional aiming to switch domains, all you need is a working laptop and the curiosity to learn.

Course Structure (35 Classes)

Note: Each class represents a 3-hour intensive session, optimized for weekend learning.

Phase 1: Python Foundations (Classes 1-4)

- **Class 1: Python Syntax & Logic.** Variables, data types, if/else statements, and basic loops.
- **Class 2: Data Structures.** Deep dive into Lists, Dictionaries, Sets, and Tuples. Nested loops.
- **Class 3: Functions & Error Handling.** Writing reusable code, lambda functions, and try/except blocks.
- **Class 4: Object-Oriented Programming (OOP) Basics.** Classes, objects, and writing a mini Python script from scratch.

Phase 2: Data Handling & Essential Math (Classes 5-10)

- **Class 5: Vectorization with NumPy.** Arrays, matrices, and mathematical operations.
- **Class 6: Data Wrangling with Pandas.** Series, DataFrames, filtering, group-bys, and handling missing values.
- **Class 7: EDA & Visualization.** Spotting trends and outliers using Matplotlib and Seaborn.
- **Class 8: Feature Engineering.** Encoding categorical variables, scaling, and creating new features.
- **Class 9: Intuitive Math & Stats.** Descriptive stats, probability, and essential linear algebra/calculus.
- **Class 10: SQL for Data Extraction.** SELECT, JOINS, and Window Functions.

Phase 3: Core Machine Learning (Classes 11-21)

- **Class 11: Linear Regression.** Understanding $y = mx + b$ at scale. Ridge and Lasso regularization.
- **Class 12: Logistic Regression.** Classification basics and the sigmoid function.
- **Class 13: Decision Trees.** Splitting criteria (Gini, Entropy) and feature importance.
- **Class 14: Random Forests.** Ensemble learning, bagging, and preventing overfitting.
- **Class 15: Gradient Boosting.** XGBoost and LightGBM for tabular data modeling.
- **Class 16: Support Vector Machines (SVMs) & KNN.** Margin maximization and distance-based classification.
- **Class 17: Unsupervised Learning.** K-Means Clustering and hierarchical clustering.
- **Class 18: Dimensionality Reduction.** PCA and t-SNE for handling high-dimensional datasets.
- **Class 19: Model Evaluation.** Precision, Recall, F1-Score, ROC-AUC, and RMSE.

- **Class 20: Hyperparameter Tuning.** Grid Search, Random Search, and Cross-Validation techniques.
- **Class 21: Mid-Term Project.** Building an end-to-end predictive model from scratch.

Phase 4: Deep Learning Foundations (Classes 22-25)

- **Class 22: Neural Network Basics.** Perceptrons, activation functions, forward and backward propagation.
- **Class 23: PyTorch/TensorFlow Workflow.** Building and training a Multilayer Perceptron (MLP).
- **Class 24: Computer Vision (CNNs).** Convolutions, pooling layers, and building an image classifier.
- **Class 25: Sequential Data (RNNs/LSTMs).** Handling time-series data and an introduction to early text modeling.

Phase 5: Generative AI & LLMs (Classes 26-31)

- **Class 26: NLP Foundations.** Tokenization, embeddings (Word2Vec), and traditional text processing limits.
- **Class 27: The Transformer Architecture.** The Attention mechanism and the shift from BERT to GPT.
- **Class 28: Working with LLM APIs.** OpenAI/Anthropic APIs, prompt engineering techniques, and open-source models.
- **Class 29: Retrieval-Augmented Generation (RAG).** Vector databases, document chunking, and querying custom data.
- **Class 30: AI Orchestration Frameworks.** Building agentic workflows using LangChain or LlamaIndex.
- **Class 31: Fine-Tuning Basics.** PEFT and LoRA for adapting models without massive compute.

Phase 6: Deployment & Capstone (Classes 32-33)

- **Class 32: Model Deployment.** Building APIs with FastAPI and creating a simple UI using Streamlit.

- **Class 33: Capstone Presentations.** Presenting final end-to-end GenAI or ML applications.

Phase 7: Career Readiness (Classes 34-35)

- **Class 34: The Portfolio & Profile.** Crafting ATS-friendly resumes, optimizing LinkedIn, and building a strong GitHub portfolio.
- **Class 35: The Interview Prep.** Cracking take-home assignments, technical live-coding strategies, and behavioral STAR interviews.