



Full Stack Data Science, ML & AI with Python

- **25 Live** classes (50 hours)
- You will learn basic to advanced ML/AI
- Theory & Python Implementations
- Real-world applications
- Projects with Deployment
- Assignments
- Course Certificate
- Course Fee: 7000tk

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Master at Kaggle & ICPC Asia-West Finalist

Bachelor in CSE at SUST, Sylhet

এই কোর্সটি শূন্য থেকে শুরু করে একজন শিক্ষার্থীকে ধাপে ধাপে Python প্রোগ্রামিং (basic, data structure, OOP) শেখাবে, যাতে সে real ডেটা নিয়ে কাজ করতে পারে। এরপর Machine Learning ও Deep Learning-এর গুরুত্বপূর্ণ অ্যালগরিদম ব্যবহার করে real-life problem সমাধানের দক্ষতা অর্জন করবে। পাশাপাশি FastAPI ব্যবহার করে ML মডেলকে API আকারে ডিপ্লয় করা, ডেটা ক্লিনিং, ফিচার ইঞ্জিনিয়ারিং ও মডেল ইভালুয়েশনসহ সম্পূর্ণ end-to-end Full Stack AI & Data Science প্রজেক্ট তৈরি করার বাস্তব অভিজ্ঞতা অর্জন করবে।

Instructor:

Kawchar Husain

[LinkedIn](#) | [Kaggle](#) | [GitHub](#) | [CodeForces](#)

◆ **Module 01: Introduction to Data Science & AI**

Class 01: Intro

- Data Science overview
- AI vs ML vs Deep Learning
- Supervised vs Unsupervised Learning
- Regression, Classification, Clustering
- Real-world use cases
- Career paths for ML/AI domain (ML+Analytics vs. Academic vs. ML+SWE)
- Required tools
- Required platforms (GitHub, Kaggle, Colab)
- Additional materials on Linear Algebra and Statistics
- Q&A Session

◆ **Module 02: Python for Data Science**

Class 02: Python Basics

- Setting up the IDE
- Python syntax
- Variables & data types
- Conditions
- Loops
- Break, Continue, Pass Statements
- Functions (def, return, parameters)
- Basic problem solving

 **Assignment:** Python problems

Class 03: Data Structures

- List
- Tuple
- Set
- Dictionary
- When & why to use each
- Hands-on practice

 **Assignment:** Python problems

Class 04: OOP & Exception Handling

- Class & object
- Constructor (`__init__`)
- Methods & attributes
- Inheritance & encapsulation
- Exception handling (`try/except`)
- Writing reusable ML-ready code

❖ Assignment: Python problems

◆ Module 03: Data Analysis & Preprocessing

Class 05: Data Understanding & Cleaning

- Different kinds of data types
- Raw data preprocessing
- Missing value handling techniques
- Outlier handling (practical rules)
- EDA using Pandas
- Visualization with Matplotlib, Seaborn, and Plotly
- Implementation with Python

Class 06: Data Transformation

- Encoding categorical variables
- Scaling & Normalization techniques
- Imbalanced data handling: SMOTE, SMOTETomek & Class weights
- Train, Test, Validation
- Preventing data leakage
- Implementation with Python

❖ Assignment: Data Cleaning and Transformation

◆ Module 04: Regression Algorithms

Class 07: Simple and Multiple Variable Regression

- Regression intuition
- Linear Regression
- Loss functions (conceptual)
- Regression metrics

- R^2 score
- Python sklearn implementation

Class 08: Polynomial Regression & Regularization Techniques

- Why polynomial over a linear
- Polynomial regression intuition
- Overfitting vs underfitting
- Lasso & Ridge (usage-focused)
- Feature impact understanding
- Implementation with Python

Class 09: KNN and Deployment Basics

- Distance-based regression
- Choosing K
- KNN for regression and classification
- ML Pipeline
- Introduction to Gradio

 **Project:** House Price Predictor with Web UI and Deployment

◆ Module 05: Classification Algorithms

Class 10: Logistic Regression

- Binary & multiclass classification
- Decision boundary intuition
- Implementation
- Confusion matrix
- Accuracy, precision, recall, F1
- ROC & AUC
- Implementation with Python

 **Assignment:** Model Evaluation

Class 11: Support Vector Machine (SVM) & Cross Validation

- Margin & hyperplane intuition
- Kernel idea (visual)
- Implementation with Python
- K-Fold & Stratified K-Fold CV

Class 12: Naive Bayes & NLP Fundamentals

- Basic probability
- Bayes theorem
- Naive Bayes (practical probability)
- Text Preprocessing & Vectorization

❖ **Project:** End-to-end Fake News Classifier App

❖ **Assignment:** End-to-end Amazon Product Review Analysis App

Class 13: Decision Tree & Ensemble Learning

- Decision Tree intuition
- Bagging vs. Boosting
- Gradient Boosting
- Random Forest
- XGBoost
- CatBoost
- Implementation with Python

❖ **Assignment:** Find wine quality using decision tree, random forest, XGBoost

◆ Module 06: Model Evaluation & Optimization

Class 14: Hyperparameter Tuning & Project

- Grid Search
- Random Search
- Bayesian Optimization (conceptual)
- Automated tuning (Optuna)

❖ **Assignment:** Search optimal parameters for the XGBoost model from class 13.

◆ Module 07: Unsupervised Learning

Class 15: Cluster Analysis

- Unsupervised learning concepts
- K-Means clustering
- Elbow method

📌 **Project:** End-to-End Cluster Analysis App with Streamlit

📌 **Assignment:** Customer segmentation

◆ **Module 08: Time Series Analysis**

Class 16: Time Series for Machine Learning

- Time-series basics
- Stationary vs non-stationary
- ARIMA & SARIMA
- Prophet

📌 **Project:** Stock Market Forecast

◆ **Module 09: Model Deployment with FastAPI**

Class 17: FastAPI for AI/ML

- What is FastAPI
- Importance of FastAPI for ML
- REST API basics (GET, POST)
- Creating an ML inference API
- Request/response schema with Pydantic
- Model loading & prediction endpoint
- Testing API with Swagger UI
- Basic deployment readiness
- Additional resource on FastAPI

📌 **Project:** ML Model Inference API using FastAPI

◆ **Module 10: Deep Learning with PyTorch**

Class 18: Neural Network Foundations

- Neuron
- Perceptron
- ANN
- Activation functions
- Loss functions
- Training workflow
- Optimizers

Class 19: PyTorch Fundamentals

- Tensors
- Dataset & DataLoader
- Training & evaluation loop
- Implementing ANN with PyTorch

Class 20: Computer Vision with CNN (Theory)

- CNN architecture
- Convolution & pooling
- Transfer learning
- Image classification project idea

Class 21: Object Detection with YOLO and Faster R-CNN

- Object detection basics
- Bounding Boxes

❖ **Project:** Real-Time Object Detection with YOLO

❖ **Assignment:** Object Detection with Faster R-CNN

Class 22: Sequential Models (Theory)

- RNN
- LSTM
- GRU
- Sequence modeling
- Time-series DL use cases

Class 23: Sequential Models with Python

- Sequence modeling with Python

❖ **Project:** End-to-End Sequence Predictor

Class 24: Transformer

- Transformer Architecture
- BERT Vs. DistilBERT

❖ **Project:** Text Classification with BERT

 **Assignment:** Real Vs. AI-Generated Text Classifier

Class 25: Career Guidelines: What NEXT?

- Building a Professional Resume
- Job and Internship Guidelines
- Kaggle Competition
- Final Project Discussion

Contact Details:

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