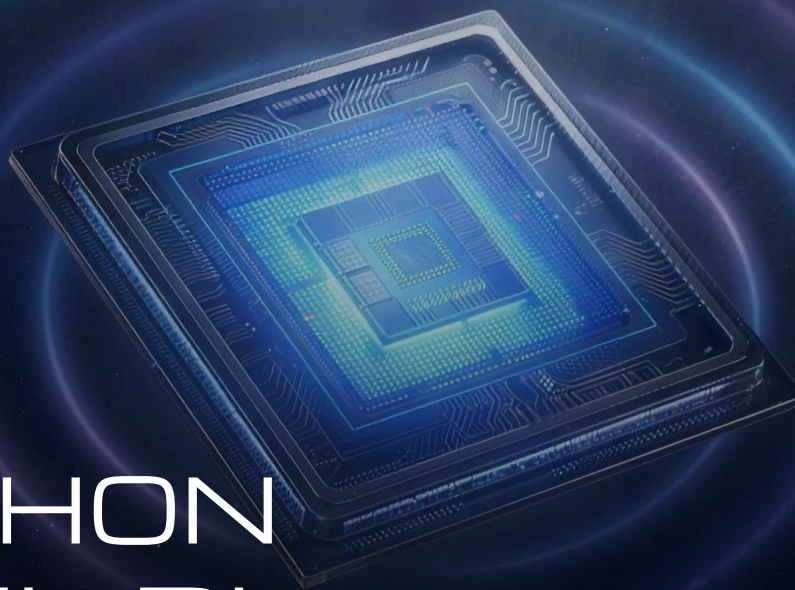




PYTHON AI, ML, DL PROGRAM

From Python fundamentals to real-world AI applications with Machine Learning, Deep Learning, Generative AI and LLMs.



12

MONTHS



16

TEACHING
WEEKS



11

MODULES



2 MO

PROJECT



6 MO

INTERNSHIP

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01 COURSE OVERVIEW

The course begins with Python programming, mathematics, statistics, probability, and data visualization, establishing the essential foundation required for AI and Machine Learning. Learners then progress through Machine Learning, Deep Learning, Computer Vision, Natural Language Processing, Reinforcement Learning, and Generative AI & Large Language Models.

A strong emphasis is placed on hands-on learning and real-world projects. Students will work on applications such as house price prediction, customer churn prediction, spam detection, image classification, sentiment analysis, handwritten digit recognition, reinforcement learning agents, AI chatbots, AI assistants, and RAG-based document chatbots.

By the end of the program, learners will have developed practical skills in Python, data analysis, Machine Learning, Deep Learning, Computer Vision, NLP, Reinforcement Learning, Generative AI, LLMs, and AI application development, along with experience using industry-relevant tools and frameworks such as NumPy, Pandas, Scikit-learn, TensorFlow, Keras, PyTorch, Hugging Face, OpenAI APIs, and FastAPI.

IN SIMPLE TERMS

This course takes you from Python fundamentals to building real-world AI applications using Machine Learning, Deep Learning, Generative AI, and Large Language Models.

02 WHY THIS COURSE

- **Complete AI Learning Path:** Progress from Python and mathematical foundations to advanced AI technologies.
- **Learn by Building:** Develop practical projects based on real-world industry applications.
- **Master Core AI Technologies:** Gain hands-on knowledge of Machine Learning, Deep Learning, Computer Vision, NLP, Reinforcement Learning, Generative AI, and LLMs.
- **Real-World Project Experience:** Build applications such as prediction systems, image classifiers, chatbots, AI assistants, and RAG-based applications.
- **Industry-Relevant Tools:** Work with popular frameworks and libraries including NumPy, Pandas, Scikit-learn, TensorFlow, Keras, PyTorch, Hugging Face, OpenAI APIs, and FastAPI.
- **AI Application Development:** Learn how to transform AI models into practical, usable applications.
- **Generative AI & LLM Skills:** Develop modern skills in LLMs, AI assistants, prompt-based applications, and RAG systems.
- **Career-Oriented Learning:** Build a strong portfolio of projects that demonstrates practical AI development skills.
- **Foundation to Advanced Level:** Suitable for learners who want a structured path from Python fundamentals to advanced AI application development.

03 COURSE AT A GLANCE

	PREREQUISITE	None
	COURSE DURATION	48 Weeks (12 Months)
	MODE OF INSTRUCTION	In-Person (Offline)
	TEACHING DURATION	16 Weeks (4 Months)
	PROJECT DURATION	8 Weeks (2 Months)
	INTERNSHIP DURATION	24 Weeks (6 Months)
	DAILY STRUCTURE	Teaching class 2 hours & Lab Practice 4 hours / day

04 PROGRAM TIMELINE



Sixteen weeks of classroom teaching and lab practice, followed by eight weeks of project work and a twenty-four week internship.

05

MODULE CURRICULUM

11 MODULES · TEACHING WEEKS 1-16

M01

INTRODUCTION

Python Fundamentals

WEEK 1-2

- 01 Python Basics
- 02 Variables
- 03 Data Types
- 04 Operators
- 05 Input/Output
- 06 Conditional Statements
- 07 Loops
- 08 Functions
- 09 Lambda Functions
- 10 File Handling
- 11 Exception Handling
- 12 Modules & Packages

M02

PYTHON DATA TOOLS

Python Libraries for Data Science

WEEK 3

- 01 NumPy
- 02 Pandas
- 03 Matplotlib
- 04 Seaborn

MO3

MATH FOR MACHINE LEARNING

Mathematics for AI/ML

WEEK 4

01 Linear Algebra

02 Matrices

03 Calculus Concepts

04 Distance Measures

MO4

STATISTICAL FOUNDATIONS FOR AI

Statistics & Probability

WEEK 5

01 Mean, Median, Mode

02 Variance

03 Standard Deviation

04 Probability

05 Normalization

06 Standardization

M05

COMPUTER VISION FUNDAMENTALS

Computer Vision Basics

WEEK 5

-
- 01 Digital Images
 - 02 Image Processing
 - 03 Image Classification
 - 04 Object Detection
-

M06

MACHINE LEARNING: FROM DATA TO MODELS

Machine Learning Fundamentals

WEEK 6-9

-
- 01 AI, ML, DL Overview
 - 02 Data Cleaning
 - 03 Feature Engineering
 - 04 Data Visualization
 - 05 Linear Regression
 - 06 Polynomial Regression
 - 07 Logistic Regression
 - 08 Decision Trees
 - 09 KNN
 - 10 Naïve Bayes
 - 11 Model Evaluation
-



-
- 01** Clustering
 -
 - 02** K-Means
 -
 - 03** Hierarchical Clustering
 -
 - 04** PCA
 -
 - 05** Random Forest
 -
 - 06** Gradient Boosting
 -
 - 07** Overfitting
 -
 - 08** Underfitting
 -
 - 09** Cross Validation
 -
 - 10** NLP Basics
 -
 - 11** TF-IDF
 -
 - 12** Sentiment Analysis
 -

M08^{DL} Deep Learning

WEEK 12

01 Neural Networks

02 TensorFlow

03 Keras

04 PyTorch

05 CNN

06 Transfer Learning

07 RNN

08 LSTM

09 Autoencoders

M09^{RL} Reinforcement Learning

WEEK 13

01 RL Concepts

02 Agent, Environment, Rewards

03 Q-Learning

04 Deep Q-Learning

05 Gymnasium

06 CartPole

07 FrozenLake

M10

APPLIED GENERATIVE AI

Generative AI & LLMs

WEEK 14

-
- 01 LLMs
 - 02 Transformers
 - 03 BERT
 - 04 GPT
 - 05 Prompt Engineering
 - 06 Hugging Face
 - 07 OpenAI APIs
 - 08 AI Agents
 - 09 FastAPI Deployment
-

M11

REAL-WORLD AI PROJECTS

Capstone Projects

WEEK 15-16

-
- 01 House Price Prediction
 - 02 Customer Churn
 - 03 Spam Detection
 - 04 CNN Projects
 - 05 Face Recognition
 - 06 AI Chatbot
 - 07 AI Assistant
 - 08 RAG Chatbot
 - 09 Self-Driving Car Sensors and AI Concepts
-

06 PROJECT PHASE & INTERNSHIP



COURSE PROJECT

WEEK 17-24

- Project work



INTERNSHIP

WEEK 25-48

Twenty-four weeks of internship experience following the teaching and project phases.

By the end of the program, learners finish with sixteen weeks of teaching, eight weeks of project work, and a twenty-four week internship.

07 ADDITIONAL SKILLS TRAINING

Along with the technical curriculum, students will receive dedicated training in professional and career-development skills:

- **English Language Skills:** Improve grammar, vocabulary, reading, writing, and workplace English.
- **Communication Skills:** Develop effective verbal and written communication.
- **Soft Skills Development:** Build confidence, teamwork, problem-solving, and interpersonal skills.
- **Public Speaking & Presentation Skills:** Improve presentation, speaking, and audience-engagement skills.
- **Resume Preparation:** Create professional, industry-ready resumes.
- **Interview Preparation:** Learn interview techniques, question handling, and professional responses.
- **Mock Interviews:** Participate in practice interviews with feedback and performance evaluation.
- **5 Real-World Interview Opportunities:** Get opportunities to attend five actual industry interviews.
- **Career Guidance & Placement Preparation:** Receive guidance for career planning, job opportunities, and placement readiness.

08 JOB SCOPE

JOB TITLE	DEMAND	AVG. PACKAGE
Python Developer	High Demand	₹5-10 LPA
Data Analyst	High Demand	₹5-10 LPA
Machine Learning Engineer	High Demand	₹8-18 LPA
AI Engineer	High Demand	₹8-20 LPA
Deep Learning Engineer	Growing Demand	₹8-20 LPA
Computer Vision Engineer	Growing Demand	₹8-18 LPA
NLP Engineer	Growing Demand	₹8-20 LPA
Data Scientist	High Demand	₹8-20 LPA
AI/ML Software Engineer	High Demand	₹8-20 LPA
Generative AI Engineer	Very High Demand	₹10-25 LPA
LLM Engineer	Very High Demand	₹10-25 LPA
AI Application Developer	High Demand	₹7-18 LPA
MLOps Engineer	Growing Demand	₹8-20 LPA
AI Research Engineer	Specialized Demand	₹10-25 LPA
Robotics / AI Engineer	Growing Demand	₹7-18 LPA

09

PROFESSIONAL CAPABILITIES DEVELOPED

 Python Engineering

- Write clean Python programs using variables, loops, conditionals, functions and lambda expressions
- Handle files and exceptions properly and organise code into reusable modules

 Data Analysis

- Clean, transform and analyse datasets using NumPy and Pandas
- Build clear charts and visual summaries using Matplotlib and Seaborn
- Turn raw data into findings that can be explained to a non-technical audience

 Maths and Statistics

- Apply the linear algebra, matrices and calculus concepts that power ML algorithms
- Use probability, variance, standard deviation and distance measures to reason about data
- Normalise and standardise data correctly before model training

 Classical Machine Learning

- Build and evaluate regression, logistic regression, decision tree, KNN and Naive Bayes models
- Engineer features from messy data and use cross validation to control overfitting and underfitting
- Apply K-Means, hierarchical clustering, PCA, random forest and gradient boosting on real datasets

 Deep Learning

- Design and train neural networks using TensorFlow, Keras and PyTorch
- Build CNNs for image tasks and RNN and LSTM models for sequence data
- Use transfer learning and autoencoders, and train reinforcement learning agents with Q-learning in Gymnasium

 Vision and Language

- Process digital images and build image classification and object detection systems
- Apply NLP techniques such as TF-IDF and build sentiment analysis models
- Take a vision or text problem from raw input to a working model

 Generative AI

- Work with transformer models such as BERT and GPT through Hugging Face and OpenAI APIs
- Write effective prompts and build AI agents and RAG-based chatbots

 Deployment and Portfolio

- Deploy ML models and LLM applications as working APIs using FastAPI
- Present a portfolio of end-to-end capstone projects, from house price prediction to an AI assistant
- Explain design choices in each project the way interviewers expect

10 PROGRAM OUTCOMES

- Can build, train, evaluate and deploy machine learning and deep learning models using industry-standard tools such as TensorFlow, Keras and PyTorch
- Can take a raw dataset through the full workflow: cleaning, feature engineering, model building, evaluation and improvement
- Can build and deploy generative AI applications, including RAG chatbots and AI agents, using Hugging Face, OpenAI APIs and FastAPI
- Leaves with a portfolio of capstone projects covering prediction, churn, spam detection, computer vision, face recognition and chatbot applications
- Carries eight weeks of dedicated project experience plus a twenty-four week internship applying these skills on real work
- Can explain the maths and statistics behind model choices, a skill hiring teams regularly test in interviews

11 CAREER ALIGNMENT

This program prepares learners for the applied layer of the AI job market: the teams that build, train and ship models and AI applications, rather than pure research. Graduates enter through pathway roles such as junior ML engineer or AI application developer and grow into specialist positions. In interviews, a working portfolio of capstone projects plus internship experience carries more weight than certificates alone, because hiring teams in India increasingly test hands-on skills.

TARGET ROLES

Python Developer (AI and Data Teams)

Data Analyst

Junior Machine Learning Engineer

AI Application Developer

Generative AI Engineer (Entry Level)

Junior Data Scientist

12 PREREQUISITES

✓ REQUIRED

- Basic computer use: managing files and folders, installing software
- Commitment to attend daily classes and complete the daily lab practice

★ RECOMMENDED BACKGROUND

- Comfort with school-level maths; the maths module refreshes everything needed
- Prior exposure to any programming language is helpful, but not required
- Patience to experiment, make mistakes and debug code

i HOW THE PROGRAM BUILDS TECHNICAL READINESS

No prior technical background is expected. The program starts from Python basics in week one and builds each layer on the previous one: Python first, then data handling, then the maths and statistics behind the models, then machine learning itself. Daily lab practice of four hours turns each concept into working code the same day, so learners are never left with theory alone.

⊗ NOT REQUIRED

- No prior programming experience: Python is taught from scratch
- No engineering or computer science degree
- No prior exposure to AI, ML or data science
- No advanced mathematics: every required concept is taught inside the program

13 DELIVERY APPROACH

TRAINING PHASE • WEEKS 1-16

- 16 teaching weeks: 2 hours of concept teaching followed by 4 hours of supervised lab practice every day
- Every concept is applied the same day in the lab: learners write the code, break it, fix it and build small working pieces themselves
- A mix of individual exercises and team mini projects builds the habits real AI teams expect: shared code, reviewing each other's work and presenting results

BEYOND THE CLASSROOM • WEEKS 17-48

- Weeks 17 to 24: eight weeks of dedicated project work, turning capstone ideas into complete, portfolio-ready applications
- Weeks 25 to 48: a twenty-four week internship where learners apply their skills on real work and gain industry experience before the job search

ASSESSMENT

- Assessment is continuous and hands-on: project-based work throughout the course, culminating in capstone projects in weeks 15 and 16

14 CURRICULUM GOVERNANCE

This curriculum is reviewed and refreshed on a regular cycle to keep pace with the fast-moving AI, machine learning and generative AI tooling landscape, so that learners consistently train on current, industry-relevant tools and practice rather than a static snapshot of today's syllabus.

LET'S BUILD YOUR **AI** CAREER.



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