

**2/ 4 / 6-Weeks Online Live**  
**FDP | Internship Training | Industrial Training**  
on  
**Agentic AI, Machine Learning, Deep Learning, Computer Vision,  
NLP & Chat GPT)**

**Training Duration:**

Duration	Training Hours per day	Total Training Hours
<b>6-Weeks</b>	3-hours (Mon-Friday)	90 Hours
<b>4-Weeks</b>	3-hours (Mon-Friday)	60 Hours
<b>2-Weeks</b>	3-hours (Mon-Friday)	30 Hours

**Training Highlights:**



**10+ AI Projects**  
will be covered during the training.



online Live Training.



**Training includes:** Assignments, Projects  
with Code, Training PPT's & Recording.



The **certificate of completion** will be  
provided to each participant by Edulabs in  
association with Mechanica IIT Madras

**Certifications:**

We offer following type of training certificates

- 2/4 Weeks Training **Completion** Certificate from Edulabs in association with Mechanica IIT-M


- 2/4 Weeks **FDP** Certificate of Completion from Eduxlabs association with Mechanica IIT-M
- 2/4 Weeks **Industrial** Certificate of Completion from Eduxlabs association with Mechanica IIT-M
- 2/4 Weeks **Internship** Completion Letter from Eduxlabs (Only for Internship Participants)

## 2 / 4 /6-WEEKS TRAINING PROGRAM OUTLINES:

<b>64-WEEKS</b>	<b>MODULE</b>	<b>HOURS</b>
<b>1<sup>ST</sup>-WEEK</b>	<ul style="list-style-type: none"> <li>• Python Programming from scratch</li> <li>• Data Processing using Python</li> <li>• Data Science fundamental</li> </ul>	<b>15-HRS</b>
<b>2<sup>ND</sup>-WEEK</b>	<ul style="list-style-type: none"> <li>• Data Analysis using Python</li> <li>• Data Visualisation using Python</li> <li>• Machine Learning Foundation</li> </ul>	<b>15-HRS</b>
<b>3<sup>RD</sup>- WEEK</b>	<ul style="list-style-type: none"> <li>• Machine Learning Intermediate</li> <li>• Machine Learning Advance</li> <li>• Recommendation Systems</li> <li>• Deep Learning Foundation</li> <li>• Deep Learning Advanced</li> </ul>	<b>15-HRS</b>
<b>4<sup>TH</sup> - WEEK</b>	<ul style="list-style-type: none"> <li>• Computer Vision</li> <li>• Natural language processing (NLP)</li> <li>• Chat Bots</li> <li>• Time Series</li> </ul>	<b>15-HRS</b>
<b>5 &amp; 6 - WEEK</b>	<ul style="list-style-type: none"> <li>• AI Agents, LLMs, RAG, Vector DB &amp; Prompt Engineering</li> <li>• Build AI agents for social media, emails, web research &amp; automation</li> <li>• Create a personal AI assistant like Microsoft Copilot using open-source LLMs</li> <li>• Learn deployment, selling, security &amp; business use cases</li> </ul>	<b>30-HRS</b>

**To Know More Visit:** <https://www.eduxlabs.com/machinelearning>

## TRAINING PROJECTS WEEK WISE

<p><b>2-weeks</b>  <b>MACHINE LEARNING PROJECTS</b></p>	<p> <b>Project 1:</b> House price prediction using Linear Regression</p> <p><b>Project 2:</b> Diabetics prediction</p> <p><b>Project 3:</b> Customer churn prediction using Decision tree &amp; Random Forest</p>
<p><b>2-weeks</b>  <b>DEEP LEARNING PROJECTS</b></p>	<p> <b>Project 1:</b> Bike Sharing Predication of bike rental count hourly or daily based on the environmental and seasonal settings.</p> <p> <b>Project 2:</b> Time Series Forecasting (LSTM) and Prediction Curve-Global</p> <p> <b>Project 3:</b> ECG Heart Beat Analysis, Visualization and Heart Beat Classification using ANN Classification</p> <p> <b>Project 4:</b> Classification of Devanagari Handwritten Characters Classify handwritten Devanagari characters using Neural Network.</p>
<p><b>COMPUTER VISION PROJECTS</b></p> <p>+</p> <p><b>DEEP LEARNING PROJECTS</b></p>	<p> <b>Project 1:</b> Face and Eye Detection – Using Haar Cascade and Cascade Classifier</p> <p><b>Project 2:</b> Face Recognition using Computer Vision and Deep Learning</p> <p><b>Project 3:</b> Time Series on Flights Passengers Forecasting.</p>
<p><b>NLP PROJECT</b></p> <p>+</p> <p><b>CHABOT PROJECT</b></p>	<p> <b>Project 1:</b> Amazon Product Reviews Sentiment Analysis</p> <p><b>Project 2:</b> Zomato Restaurant Reviews Sentiment Analysis using LSTM Algorithm</p> <p> <b>Project 3:</b> Conventional Chatbot using Open AI, GPT. (Built your ChatBot with OpenAI GPT3)</p>
<p><b>AGENTIC AI PROJECTS</b></p>	<ul style="list-style-type: none"> <li>• Build AI agents for social media, emails, web research &amp; automation</li> <li>• Create a personal AI assistant like Microsoft Copilot using open-source LLMs</li> <li>• Learn deployment, selling, security &amp; business use cases</li> </ul>

## 2 / 4/ 6-WEEKS COURSE CONTENT ON

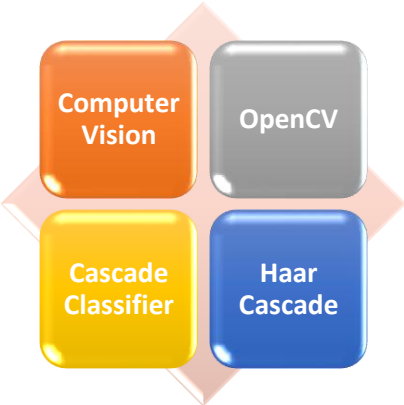
### AI & Machine Learning, Deep Learning, Computer Vision, NLP & Chabot

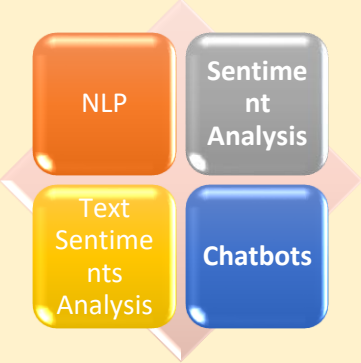
2/ 4 /6-Weeks	MODULES
<p><b>1<sup>st</sup> – Week</b></p> <p><b>Data Analysis Fundamentals with Python</b></p> <div style="text-align: center; margin-top: 20px;">  </div>	<p><b>Module 1: Data Science Fundamentals</b></p> <ul style="list-style-type: none"> <li>Introduction to Data Science</li> <li>Introduction to Machine Learning</li> <li>Artificial Intelligence vs Machine Learning</li> <li>Benefits of Machine Learning w.r.t. traditional methodologies</li> <li>Deep Learning - Introduction</li> <li>How DL is different from all other Machine Learning methods</li> <li>Supervised and Unsupervised learning</li> <li>Reinforcement Learning</li> <li>AI Training &amp; testing flow</li> <li>Classification and Regression in Supervised Learning</li> <li>Clustering and Association in Unsupervised Learning</li> <li>Types of Algorithms</li> <li>Data Science Flow &amp; Essentials</li> </ul> <p><b>Module 2: Python Fundamentals [CORE]</b></p> <ul style="list-style-type: none"> <li>Overview of Python- Starting with Python</li> <li>Python data types: Primitive</li> <li>Core built-in data structures – Lists, Tuples, Dictionaries</li> <li>String, String built-in methods</li> <li>Data manipulation tools (Operators, Functions, Packages, control structures, Loops, arrays etc)</li> <li>Loops and Conditional statements</li> <li>Python UDFs – def keywords</li> <li>Reading and writing files</li> </ul> <p><b>Module 3: Data Manipulation With PANDAS</b></p> <ul style="list-style-type: none"> <li>Concept of Packages/Libraries - Important packages (NumPy, SciPy, Pandas)</li> <li>Importing Data from various sources (CSV, txt, excel, access etc)</li> <li>Exporting Data to various formats</li> <li>Data Manipulation steps (Sorting, filtering, duplicates, merging, appending, sub setting, derived variables, sampling, Data type conversions, renaming, formatting etc)</li> <li>Scaling and Normalizing data</li> <li>Pre-processing and Feature Selection.</li> </ul>

<p><b>Data Visualization &amp; EDA</b></p>	<p><b>Module 1: Data Visualization</b></p> <ul style="list-style-type: none"> <li>• Seaborn</li> <li>• Matplotlib</li> <li>• Time series Plot of Covid19 Data</li> <li>• Coronavirus 2019-20 Visualization on World Map</li> </ul> <p><b>Module 2: IMPLEMENTATION OF STATS METHODS</b></p> <ul style="list-style-type: none"> <li>• Basic Statistics - Measures of Central Tendencies and Variance</li> <li>• Building blocks - Probability Distributions - Normal distribution</li> <li>• Central Tendency, Standard Deviation</li> <li>• Quartiles, IQR, Boxplot, Outliers</li> <li>• Skewness, Kurtosis</li> </ul>
<p><b>2<sup>nd</sup> – Week</b></p> <p><b>MACHINE LEARNING FOUNDATION REGRESSION</b></p> 	<p><b>Module 1: LINEAR REGRESSION</b></p> <ul style="list-style-type: none"> <li>• Regression Problem Analysis</li> <li>• Mathematical modelling of Regression Model</li> <li>• L1 &amp; L2 Regularization</li> <li>• Cost Function</li> <li>• Optimizers - Gradient Descent Algorithm</li> <li>• Parameters &amp; Hyperparameters</li> <li>• Cost Function &amp; Cost Optimizer: Gradient Descent Algorithm</li> <li>• R Squared &amp; Adj. Squared</li> <li>• Univariate Linear Regression Model</li> <li>• Polynomial Linear Regression</li> <li>• Multivariate Regression Model</li> <li>• Model Predictions, Model Accuracy, Graphical Plotting</li> </ul> <p><b>Module 2: LOGISTIC REGRESSION</b></p> <ul style="list-style-type: none"> <li>• Assumptions</li> <li>• Logit Transformation</li> <li>• Hypothesis – Sigmoid Equation, Logistic Equation</li> <li>• Odds Ratio and Interpretation</li> <li>• Model Specification</li> <li>• Prediction Probability</li> <li>• Model Parameter Significance Evaluation</li> <li>• Model Optimization of threshold value</li> <li>• Confusion Matrix, Precision, Recall, F1-Score, ROC Curve, Classification report</li> </ul> <p><b>Module 3: DECISION TREE &amp; RANDOM FOREST ALGORITHM</b></p> <ul style="list-style-type: none"> <li>• Concept and Working Principle</li> <li>• Mathematical Modelling</li> <li>• Optimization Function Formation</li> <li>• Analysis of Classification Problem case</li> <li>• Math: Role of Entropy, Gini Index and Information Gain in Decision Trees</li> <li>• Decision Trees – ID3</li> <li>• Overfitting and Pruning</li> <li>• Plotting Tree</li> <li>• Random Forest</li> </ul>

	<p><b>Module 4: KNN (K- Nearest Neighbours)</b></p> <ul style="list-style-type: none"> <li>• K- Nearest Network – Introduction</li> <li>• How does the KNN algorithm work?</li> <li>• Methods of calculating distance between points</li> <li>• Methods to choose the K</li> <li>• GridSearchCV</li> </ul>
<p><b>3<sup>rd</sup> – Week:</b></p> <p><b>MACHINE LEARNING INTERMEDIATE</b></p> 	<p><b>Module 1: Naïve Bayes Classifier</b></p> <ul style="list-style-type: none"> <li>• Bayesian Classification</li> <li>• How Naive Bayes algorithm works?</li> <li>• Naive Bayes Application – Binary Class &amp; Multi-Class Classification</li> <li>• Gaussian Naive Bayes</li> <li>• Multinomial Naive Bayes</li> </ul> <p><b>Module 2: CLUSTERING – K-MEANS and Hierarchical</b></p> <ul style="list-style-type: none"> <li>• Unsupervised Learning</li> <li>• Clustering Introduction</li> <li>• K-Means Clustering</li> <li>• Handling K-Means Clustering</li> <li>• Maths behind KMeans Clustering – Centroids</li> <li>• Mean shift Introduction</li> <li>• Elbow Method – Picking K in K-Means</li> <li>• Hierarchical Clustering</li> <li>• Types – Agglomerative and Divisive</li> <li>• Dendrogram</li> </ul> <p><b>Module 3: Support vector machines (S V M)</b></p> <ul style="list-style-type: none"> <li>• Concept and Working Principle</li> <li>• Mathematical Modelling</li> <li>• Linear Support Vector Machine</li> <li>• Hyperplanes</li> <li>• Optimal separating hyperplane</li> <li>• Drawing Margins</li> <li>• Optimization Function Formation</li> <li>• The Kernel Method and Nonlinear Hyperplanes</li> </ul>
<p><b>MACHINE LEARNING ADVANCE</b></p>	<p><b>Module 1: Time series Forecasting</b></p> <ul style="list-style-type: none"> <li>• Time Series - Introduction</li> <li>• Techniques and applications</li> <li>• Components of Time Series Forecasting</li> <li>• Moving average, Smoothing</li> <li>• ARIMA Model</li> <li>• Seasonality in Time Series</li> <li>• Prophet Model</li> </ul> <p><b>Module 2: Recommendation System</b></p> <ul style="list-style-type: none"> <li>• Association Rule Learning</li> <li>• Components of Apriori algorithm: Support, Confidence, Lift</li> <li>• Market Basket Analysis</li> <li>• Collaborative Filtering</li> </ul>

	<p><b>Module 3. Advanced Ensemble Learning</b></p> <ul style="list-style-type: none"> <li>• Random Forest</li> <li>• Bagging</li> <li>• Boosting</li> <li>• Adaboost</li> <li>• XGboost</li> </ul>
<p><b>Artificial Intelligence Foundation</b></p> 	<p><b>Module 1: Artificial Neural Networks</b></p> <ul style="list-style-type: none"> <li>• MP Neuron</li> <li>• Perceptron</li> <li>• Logic gates</li> <li>• ANN &amp; Working</li> <li>• Single Layer Perceptron Model</li> <li>• Multilayer Neural Network</li> <li>• Feed Forward Neural Network</li> <li>• Cost Function Formation</li> <li>• Activation Function</li> <li>• Cost Function</li> <li>• Applying Gradient Descent Algorithm</li> <li>• Stochastic Gradient Descent</li> <li>• XOR Logic using MLP</li> </ul> <p><b>Module 2: TensorFlow</b></p> <ul style="list-style-type: none"> <li>• TensorFlow library for AI</li> <li>• Keras – High Level TensorFlow API</li> <li>• Getting started with TensorFlow</li> <li>• Installation &amp; Setting up TensorFlow</li> <li>• TensorFlow Data Structures</li> <li>• Tensor board – Visualization</li> </ul> <p><b>Module 3: Regression with ANN</b></p> <ul style="list-style-type: none"> <li>• Learning Algorithm</li> <li>• Linear Regression – Theory</li> <li>• Feature selection - Correlation</li> <li>• Input Matrix &amp; Output Labels</li> <li>• Activation Function</li> <li>• Training A single perceptron</li> <li>• Model Optimizers - Parameters and Hyperparameters</li> <li>• Multiple Linear Regression</li> </ul> <p><b>Module 4: Classification with ANN</b></p> <ul style="list-style-type: none"> <li>• Logistic Regression – Theory</li> <li>• Classification Problems</li> <li>• Training the model</li> <li>• Binary Class and Multi-Class Classification</li> <li>• Hypothesis, Parameters &amp; Hyperparameters, Cost Function, Model Optimization – Optimizers</li> <li>• Activation Function</li> </ul>
<p><b>4<sup>th</sup> – Week</b></p> <p><b>Deep Learning</b></p>	<p><b>Module 1: CNNs (Convolutional Neural Networks)</b></p> <ul style="list-style-type: none"> <li>• Convolutional Neural Network</li> </ul>

	<ul style="list-style-type: none"> <li>• Understanding the architecture and use-cases of CNN</li> <li>• Pooling Layer</li> <li>• How to visualize using CNN</li> <li>• How to fine-tune a convolutional neural network</li> <li>• What is transfer learning</li> <li>• Kernel filter, Feature maps, and pooling</li> <li>• Deploying convolutional neural networks in TensorFlow</li> </ul> <p><b>Module 2: RNNs (Recurrent Neural Networks)</b></p> <ul style="list-style-type: none"> <li>• Introduction to the RNN model</li> <li>• Modelling sequences</li> <li>• Unfolded RNN</li> <li>• Types of RNN &amp; Use Case</li> <li>• Training RNNs with back propagation</li> <li>• Backward Propagation</li> <li>• Problems in Traditional RNN</li> <li>• Long short-term memory (LSTM)</li> <li>• Forget Gate, Input Gate, Output Gate</li> </ul>
<p><b>COMPUTER VISION</b></p> 	<p><b>Module 1: Introduction to OpenCV</b></p> <ul style="list-style-type: none"> <li>• Introduction to OpenCV</li> <li>• Image Processing</li> <li>• Working &amp; implementation with Image</li> <li>• Edge Detection &amp; smoothing of image</li> <li>• Working with resolution</li> <li>• Colour filtering on Image</li> <li>• Image Contour</li> <li>• Feature Extraction</li> <li>• Reading Video using Computer Vision</li> <li>• Implementation of color filter on video</li> <li>• Modifying Video resolution</li> <li>• OpenCV gradients</li> </ul> <p><b>Module 2: Cascade Classifier and HaarCascade</b></p> <ul style="list-style-type: none"> <li>• Cascade Classifiers</li> <li>• Haar Cascades</li> <li>• Detect Multiscale</li> <li>• Frontal Face &amp; Eye Detection using CV2 (Computer Vision) and Haar Cascade</li> <li>•</li> </ul>
<p><b>NLP-I</b></p>	<p><b>Module 1: Introduction to NLP &amp; Word Vectors</b></p> <ul style="list-style-type: none"> <li>• NLP</li> <li>• NLTK Package</li> <li>• Tokenization</li> <li>• Lemmatization and Stemming</li> <li>• Stop Words</li> <li>• Regex</li> <li>• Bag-of-Words</li> <li>• TF-IDF</li> </ul>

	<p><b>Module 2: NLP - Sentiment Analysis</b></p> <ul style="list-style-type: none"> <li>• NLP Text Analysis</li> <li>• Frequency Distribution</li> <li>• Text Sentiments Analysis</li> </ul>
<p><b>Chatbots and OpenAI</b></p>	<p><b>Module 1: Chatbots</b></p> <ul style="list-style-type: none"> <li>• Chatbot Introduction</li> <li>• Chatbot Flow and Architecture</li> <li>• OpenAI Introduction</li> <li>• GPT3</li> <li>• Built your ChatBot with OpenAI GPT3</li> </ul>
<p><b>5<sup>th</sup> &amp; 6<sup>th</sup> week</b> <b>Agentic AI</b></p>	<ul style="list-style-type: none"> <li>• AI Agents, LLMs, RAG, Vector DB &amp; Prompt Engineering</li> <li>• Build AI agents for social media, emails, web research &amp; automation</li> <li>• Create a personal AI assistant like Microsoft Copilot using open-source LLMs</li> <li>• Learn deployment, selling, security &amp; business use cases</li> </ul>

### Participant Eligibility & Prerequisite:

- The program is open to the Faculty/ Research Scholars/ Students of science & Engineering institutes and working IT professionals are also, eligible.
- There are no prerequisites for this training, you will learn AI from scratch.

### To Know More Visit:

<https://www.eduxlabs.com/machinelearning>

#### **EduxLabs Team**

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