



SHARDA
UNIVERSITY
Beyond Boundaries



HANDS ON TRAINING PROGRAM ON

AI, MACHINE LEARNING, COMPUTER VISION, DEEP LEARNING AND NVIDIA DGX100 SUPERCOMPUTER



**Centre for Artificial Intelligence in Medicine,
Imaging & Forensics (CAIMIF)**

Starting from 01st Feb to 03rd May 2025 (40 Hrs Total)

The "AI, Machine Learning, Computer Vision, Deep Learning and Nvidia DGX100 Supercomputer" training program is designed to empower participants with the essential skills and knowledge needed to excel in the fields of programming and artificial intelligence. This program offers a comprehensive introduction to Python, covering foundational concepts and practical coding techniques. Participants will also explore key AI, machine learning and deep learning principles, learning how to implement and apply these techniques to real-world problems. Through hands-on projects and guided exercises, attendees will gain practical experience in developing and deploying AI/ML models, equipping them with the tools to navigate the rapidly evolving tech landscape.

Objectives

- **Foundational Python Skills:** Equip participants with a solid understanding of Python programming basics, including data types, control structures, functions, and libraries, to ensure they can write and debug simple Python scripts. Exploratory Data Analysis: Understanding various types of data, techniques for pre-processing the data and visualizing the data using Matplotlib and Seaborn libraries and implementing statistical functions on data using python.
- **Machine Learning Foundations and Advanced Concepts:** Provide an overview of key AI/ML concepts, such as supervised and unsupervised learning, model evaluation metrics, and common algorithms Linear and Logistic Regression, decision trees, random forests, support vector machines, K-means Clustering, Concept of dimensionality reduction and ensemble techniques
- **Practical Application of AI/ML Techniques:** Enable participants to apply AI/ML techniques using Python libraries (e.g., NumPy, Pandas, Scikit-learn, TensorFlow) to solve real-world problems, including data preprocessing, model training, and evaluation.
- **Deep Learning Foundations and Advanced:** Demonstrating neural networks using feedforward neural networks and backpropagation algorithm, understanding activation and cost functions, using artificial neural networks for regression and classification. Understanding and using Convolution neural networks for image classifications.
- **Hands-on Project Development:** Guide participants through developing and deploying a simple Machine Learning (ML) project, from problem definition and data collection to model implementation and performance optimization, fostering practical experience and problem-solving skills.
- **Working with Nvidia DGX100:** Introducing Nvidia DGX100 server, docker containers and Kubeflow notebooks to the participants and enabling participants to train AI models on it.

Schedule and Course Details

Timing: 10:00 AM – 4:00 PM (Working Saturdays)

Date	Day	Lecture Topic	Hours
01/02/2025	Saturday	Python Fundamentals (CORE) with installations <ul style="list-style-type: none"> working with JuPyter Notebooks and Google Colab Python Syntax, operators and variables Data types, Loops and Conditional Statements Core built-in data structures – Lists, Tuples, Dictionaries and sets Working with Strings Functions 	5hrs (10:00-1:00) (2:00-4:00)
15/02/2025	Saturday	Data Manipulation with NumPy and Pandas: <ul style="list-style-type: none"> Introduction to Numpy module, Numpy Arrays and their manipulation, Numpy Functions Importing Data from various sources (CSV, excel etc) Pandas data types (series and dataframes) Pandas DataFrames and their manipulation Data Manipulation using Numpy and Pandas (using a case study) 	5hrs (10:00-1:00) (2:00-4:00)
01/03/2025	Saturday	Exploratory Data Analysis: <ul style="list-style-type: none"> Types of Data Data Pre-processing and Feature Selection Scaling and Normalizing data Data Visualization using matplotlib and seaborn Implementation of Basic Statistics methods 	5hrs (10:00-1:00) (2:00-4:00)
Module 2 (Machine Learning Foundations and Advanced)			
08/03/2025	Saturday	Machine Learning Foundations <ul style="list-style-type: none"> Introduction to Artificial Intelligence and Machine Learning, Deep Learning – Introduction, Supervised, Unsupervised and Reinforcement Learning Linear Regression: Regression Problem Analysis, Mathematical modelling of Regression Model, Cost Function and regularizations Gradient Descent Algorithm, Parameters & Hyper parameters, R Squared & Adj. Squared, Model Predictions, Model Accuracy, Graphical Plotting Concept of Logistic Regression: Binary Logistic Regression, Example Problem Confusion Matrix, Precision, Recall, F1-Score, ROC Curve, Classification report Decision Trees and Random Forest: Concepts of Decision Trees and Random forest for classification Classification and prediction using decision trees and random forest: Example problem 	5hrs (10:00-1:00) (2:00-4:00)
29/03/2025	Saturday	Machine Learning Advanced <ul style="list-style-type: none"> Dimensionality Reduction: Concept and need for dimensionality reduction, PCA, LDA Unsupervised Learning: Clustering Introduction, K-Means Clustering: Concept and working Principle Support Vector Machines Time Series – Introduction, Techniques and applications, Components of Time Series Forecasting, ARIMA Model Advanced Ensemble Learning: Bagging, Boosting, Adaboost, Xgboost 	5hrs (10:00-1:00) (2:00-4:00)
Module 3 (Deep Learning Foundations and Advanced and Nvidia DGX100)			
05/04/2025	Saturday	Computer Vision and Introduction to Neural Networks <ul style="list-style-type: none"> Introduction to OpenCV Image Processing: Working & implementation with Image, Edge Detection & smoothing of image, Working with resolution, Colour filtering on Image, Image Contour Feature Extraction, Cascade Classifier and HaarCascade Frontal Face & Eye Detection using CV2 (Computer Vision) and Haar Cascade Introduction to Neural Networks <ul style="list-style-type: none"> Artificial Neural Networks-ANN: ANN & Working, Single Layer Perceptron Model, Multilayer Neural Network Feedforward Neural Network and Backpropagation Algorithm Activation Functions Cost Function: Applying Gradient Descent Algorithm, Stochastic Gradient Descent TensorFlow library for AI, Keras – High Level TensorFlow API 	5hrs (10:00-1:00) (2:00-4:00)
19/04/2025	Saturday	Deep Learning Foundations and Advanced <ul style="list-style-type: none"> Regression with ANN: Learning Algorithm Classification with ANN Convolutional Neural Network: CNN Vs Human Brain Convolution operation, Padding, Stride, Filters(Kernels), Pooling, Flattenning Deploying convolutional neural networks in TensorFlow (Image classification using CNN) Introduction to the RNN model, Types of RNN & Use Case Introduction to Long short-term memory (LSTM) and transformers 	5hrs (10:00-1:00) (2:00-4:00)
03/05/2025	Saturday	Working with Nvidia DGX100 SuperComputer <ul style="list-style-type: none"> Introduction to DGX Server Introduction to Docker Containers and Kubeflow Notebooks AI Model Training and Analytics 	5hrs (10:00-1:00) (2:00-4:00)
Total			40

Registration Link

<https://forms.gle/Gor6TX2kJ2o9qHmj7>

Payment Link/UPI

Bank Name : ICICI Bank Ltd.
Branch Address : Krishna Apra Royal Plaza, D-2, E(acb), Alpha-1, Greater Noida, Gautam Budh Nagar, UP- 201306
Account Holder Name : Sharda University-Seminar
Account No. : 025405005815 (CURRENT AC)
IFSC Code : ICIC0000254
SWIFT Code : ICICINBBCTS
MICR Code : 110229037



FEE STRUCTURE

Module 1 (Data Analysis Fundamentals with Python)	1500
Module 2 (Machine Learning Foundations and Advanced)	1500
Module 3 (Deep Learning Foundations and Advanced) and Introducing Nvidia DGX100	1500
Module 1,2 and 3	4000

NOTE: Certificates will be issued for each module separately

Course Instructors from Center for AI in Medicine, Imaging & Forensics (CAIMIF)



Prof. (Dr.) Vasudha Arora
Professor CSE, SSET & member CAIMIF



Dr. Shree Harsh Attri
Associate Professor CSE, SSET & member CAIMIF



Convener
Prof. Ashok Kumar
Head, Center for AI in Medicine,
Imaging & Forensics Sharda University



Coordinator
Ms. Bushra Khan
Assistant Professor SAHS & coordinator CAIMIF

Lecture Time: 10:00AM to 1:00PM(OFFLINE), 2:00PM to 4:00 PM (Offline)

Venue: Center for Artificial Intelligence in Medicine, Imaging and Forensics
Room 103 B, Block 2, Sharda University