



CENTRE FOR DEVELOPMENT OF ADVANCED COMPUTING

A-34, PHASE VIII, INDUSTRIAL AREA, MOHALI

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Industrial Training on Artificial Intelligence using Python

Duration: 6 Months (26 Weeks) @ 4 hrs./day

Fee: Rs. 40000/- + tax can be paid in cash/debit card at CDAC, Mohali during office hours or through Demand Draft drawn in favour of "Director CDAC", payable at Mohali.

ELIGIBILITY: B.E./B.TECH., MCA, M.Sc., M.Tech. Final year students

COURSE CONTENT:

S. No.	Topic
1	Introduction to Artificial Intelligence (AI): Introduction, Evolution & History of AI, Various application areas (Healthcare, Surveillance, Analytics, and Cyber Security etc.), Scientific Applications, Introduction to Machine Learning (ML) and Deep Learning (DL), Difference between AI, ML and DL, Rule based systems, Intelligent Agents, Optimization Problems.
2	Python Programming for Artificial Intelligence: Introduction, data types, variables, operators, Input and output operations; Environment Setup, Control Flow - Decision Control, Loop statements etc.; Data Structures - Lists, Tuples, String, Dictionary, Sets; Functional Programming - function types, Recursive Functions, Lambda functions, modules and packages; OOPs concepts, Exception Handling, Python Libraries - numPy, matplotlib, pandas, scipy, seaborn etc.
3	Mathematics for Artificial Intelligence: Linear Algebra – Vector, Scalar, Matrix and operations on matrix; Probability – Basics, sampling, conditional probability, dependent and independent events; Basics of Statistics - Measures of Central Tendencies and Variance, Probability Distribution (Normal, Binomial, Poisson), Sampling Theory, Correlation, Regression, Outliers
4	Data Preparation & Visualization: Data preparation, data pre-processing, Feature Engineering – feature selection techniques, feature optimization, dimensionality reduction (Principal Component Analysis), Data cleaning and transformation, validation and modelling of data; Data Visualization – Various data plots using python libraries (Box Plot, Scatter Plot, 2D & 3D plots, time-series plot, histogram etc.)
5	Machine Learning: Basics of Machine Learning, Types – Supervised, Unsupervised and Reinforcement Learning, Applications of ML; Classification Algorithms – Linear & logistic regressions (gradient descent, loss function, cross-entropy), Support Vector Machine, Naïve Bayes Classifier, Decision Tree, Random Forest; Clustering Algorithm – k-means, Model evaluation – under fitting vs. over fitting, confusion matrix, ROC, precision, recall, F1, F2, bias & variance.



6	Deep Learning: Introduction, History, Basics of Biological Neurons, Multi-layered Perceptron (MLP), Back propagation, Artificial Neural Network – Convolution Neural Network (CNN), RNN, LSTM, Neural network models using Keras using Tensorflow, Transfer Learning.
7	Applications of Artificial Intelligence: Text Analysis – Overview, Text Processing (Grammars, Parsing, and Stemming), Semantic & Syntactic analysis, Information Retrieval, Image/Video Processing – Face recognition, object classification. Implementation of Chatbots.
8	Project Work

HOW TO APPLY:

For Admission, submit your College reference/training letter, admission form (download from www.cdac.in) along with fee of Rs. 20000/- + tax (1st Instalment) at CDAC, A-34, Phase 8, Industrial Area, Mohali – 160071.

NOTE:

- Seats are limited and admission is on first come first serve basis
- 75% attendance is must for award of certificate
- Pre-requisite is none.