राष्ट्रीय इलेक्ट्रॉनिकी एवं सूचना प्रौद्योगिकी संस्थान, गोरखपुर
National Institute of Electronics & Information Technology
(Under Ministry of Electronics and Information Technology, Govt. of India)
Deoria Road, Gorakhpur-273010

Ministry of Electronics and Information Technology
Government of India

Summer/ Internship/ Industrial Training Program on
Deep Learning using Python

06 Weeks / 90 Hours (03 Hours per day, Monday–Friday)

About the Program

This 6 weeks training program provides a comprehensive introduction to Deep Learning using Python. The program focuses on building strong fundamentals of Artificial Intelligence, Machine Learning, Neural Networks, and modern Deep Learning frameworks such as TensorFlow and Keras.

Participants will learn both theoretical concepts and hands-on implementation through practical exercises and projects.

Objective

- Understand the fundamentals of Artificial Intelligence, Machine Learning, and Deep Learning.
- Develop hands-on skills using Python libraries such as NumPy, Pandas, Matplotlib, Scikit-Learn, TensorFlow, and Keras..
- Learn to design and train neural networks for solving real-world problems.
- Apply deep learning techniques for image processing and natural language processing.
- Enable participants to develop and deploy simple deep learning applications.

Intended Users

- Students of Engineering, Polytechnic, and Computer Science disciplines.
- Faculty members and trainers who wish to learn Deep Learning.
- Researchers interested in Artificial Intelligence and Data Science.
- Working professionals interested in AI and Deep Learning.

Key Deliverables of the Program

Participants shall gain practical, industry-ready skills in AI, Data Analytics, and Cyber Security, blending theory with hands-on practice for teaching, research, and career advancement.

Week 1 – Python Basics

- Introduction to AI, ML, DL, and real-world applications
- Python basics – variables, data types, input/output
- Control structures – if-else, loops
- Functions and data structures (lists, tuples, dictionaries)
- NumPy – arrays and basic numerical operations

Week 2 – Data Handling & Visualization

- Pandas – DataFrames and loading datasets
- Data cleaning and handling missing values
- Data filtering, grouping, and aggregation
- Matplotlib – basic data visualization
- Mini project – Exploratory Data Analysis
- (EDA)

Week 3 – Machine Learning Basics

- ML workflow – train/test split, features & labels
- Linear Regression – concept and implementation
- Model evaluation – MAE, MSE, R^2
- Logistic Regression – binary classification
- KNN – distance-based classification

Week 5 – Deep Learning

- Introduction to Convolutional Neural Networks
- Image Classification using CNN
- Recurrent Neural Networks (RNN)
- Transformers and Attention Mechanism

Week 4 –Advance Deep Learning Algorithms

- Natural Language Processing Basics
- Mini Project Development
- Project Presentation and Course Wrap-up

Week 6 – Advance Deep Learning Algorithms

- LSTM & GRU – advanced sequence models
- NLP basics – text preprocessing and sentiment analysis
- Transformers and attention mechanism (conceptual)
- Mini project – model building and training
- Project completion, evaluation, and presentation

How to Apply?

Visit the Online Registration Portal (ORP) to register in the course https://regn.nielitvte.edu.in

(under Online Program Select "Gorakhpur" from "Program Offered by" drop down menu then apply for the course "Industrial Training on AI, Data Analytics and Cyber Security- A Multidisciplinary approach")

Scan the QR code

Certificates

E-Certificate will be provided to the successful participants after completion of the course.

Course Fees Structure

Offline fees: ₹ 4500.00
Online fees: ₹ 2700.00
(Inclusive GST)

Eligibility

B.E./B.Tech/BCA/MCA/M.Sc./B.Sc./Polytechnic Diploma – Passed/Pursuing *OR* 10+2 with basic programming knowledge *OR* Faculty/Teacher.

Duration & Mode

06 Weeks/ 30 Days (03 hours per day)
Mode: Online / Offline (Lab Based Training)

Prerequisite

- Basic knowledge of programming (preferably Python).
- Basic understanding of mathematics and statistics.
- Laptop/Computer with at least 8 GB RAM.
- Internet connection with good speed.

Get in Touch

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Day wise Contents

Days	Topic	Duration
Day 01	Introduction to AI, ML, DL, and real-world applications	03 Hours*
Day 02	Python basics – variables, data types, input/output	03 Hours*
Day 03	Control structures – if-else, loops	03 Hours*
Day 04	Functions and data structures (lists, tuples, dictionaries)	03 Hours*
Day 05	NumPy – arrays and basic numerical operations	03 Hours*
Day 06	Pandas – DataFrames and loading datasets	03 Hours*
Day 07	Data cleaning and handling missing values	03 Hours*
Day 08	Data filtering, grouping, and aggregation	03 Hours*
Day 09	Matplotlib – basic data visualization	03 Hours*
Day 10	Mini project – Exploratory Data Analysis (EDA)	03 Hours*
Day 11	ML workflow – train/test split, features & labels	03 Hours*
Day 12	Linear Regression – concept and implementation	03 Hours*
Day 13	Model evaluation – MAE, MSE, R^2	03 Hours*
Day 14	Logistic Regression – binary classification	03 Hours*
Day 15	KNN – distance-based classification	03 Hours*
Day 16	Decision Trees and overfitting	03 Hours*
Day 17	Evaluation metrics – accuracy, precision, recall, confusion matrix	03 Hours*
Day 18	Neural networks – perceptron and activation functions	03 Hours*
Day 19	Training – gradient descent and backpropagation	03 Hours*
Day 20	TensorFlow & Keras – building first ANN	03 Hours*

Day 21	Optimization – loss functions, dropout, early stopping	03 Hours*
Day 22	Optimization – loss functions, dropout, early stopping	03 Hours*
Day 23	CNN basics – convolution and pooling	03 Hours*
Day 24	CNN implementation for image classification	03 Hours*
Day 25	RNN basics – sequential data processing	03 Hours*
Day 26	LSTM & GRU – advanced sequence models	03 Hours*
Day 27	NLP basics – text preprocessing and sentiment analysis	03 Hours*
Day 28	Transformers and attention mechanism (conceptual)	03 Hours*
Day 29	Mini project – model building and training	03 Hours*
Day 30	Project completion, evaluation, and presentation	03 Hours*
	Total	**90 Hours**

***Duration:**
Theory+Practical: - 02 hours
Exercise/Assignment/Quiz: - 01 hour

Structure of the Course

Unit-1 – Python Basics

- Introduction to AI, ML, DL, and real-world applications
- Python basics – variables, data types, input/output
- Control structures – if-else, loops
- Functions and data structures (lists, tuples, dictionaries)
- NumPy – arrays and basic numerical operations

Unit-2 – Data Handling & Visualization

- Pandas – DataFrames and loading datasets
- Data cleaning and handling missing values
- Data filtering, grouping, and aggregation
- Matplotlib – basic data visualization
- Mini project – Exploratory Data Analysis (EDA)

Unit-3 – Machine Learning Basics

- ML workflow – train/test split, features & labels
- Linear Regression – concept and implementation
- Model evaluation – MAE, MSE, R^2
- Logistic Regression – binary classification
- KNN – distance based classification

Unit-4 – Introduction to Machine Learning and Neural Network

- Decision Trees and overfitting
- Evaluation metrics – accuracy ,precision, recall, confusion matrix
- Neural networks – perceptron and activation functions
- Training – gradient descent and backpropagation
- TensorFlow & Keras – building first ANN

Unit-5 – Deep Learning

- ANN implementation for classification
- Optimization – loss functions, dropout, early stopping
- CNN basics – convolution and pooling
- CNN implementation for image classification
- RNN basics – sequential data processing Learning

Unit-6 – Advanced topics and project work

- LSTM & GRU – advanced sequence models
- NLP basics – text preprocessing and sentiment analysis
- Transformers and attention mechanism (conceptual)
- Mini project – model building and training
- Project completion, evaluation, and presentation