

NIELIT Virtual Academy

AI13 Certificate course in Deep Learning with Python

Course Objectives

Upon completing this course, participants should be able to

- Understand the fundamentals of Artificial Neural Networks (ANNs) and apply them through practical case studies.
- Demonstrate proficiency in applying linear algebra, calculus, and optimization techniques to enhance deep learning understanding.
- Master the application of Convolutional Neural Networks (CNNs) through an understanding of convolutional layers, pooling, and case studies.
- Apply Recurrent Neural Networks (RNNs) and Long Short-Term Memory Networks (LSTMs) to handle sequential data in non-NLP tasks.
- Explore and apply advanced deep learning concepts such as generative models, Generative Adversarial Networks (GANs), and advanced LSTM techniques.
- Apply knowledge acquired throughout the course to a real-world capstone project, showcasing comprehensive understanding and practical skills.

Eligibility

- Any Bachelor's Degree -Undergoing/Completed.

Prerequisites

- Basic Understanding of Machine Learning ,Mathematics Foundation & Programming Proficiency

Methodology:

- ✓ **Live Lecture**
- ✓ **Content Access through e-learning portal**
- ✓ **Covers both Theory & Practical**
- ✓ **Assessment and Certification**

Registration Link: <http://nva.nielit.gov.in>

Contact Number: 7598730125

AI13 Certificate course in Deep Learning with Python

Module 1: Foundations of Deep Learning

Day 1	• Introduction to Artificial Neural Networks	Day 1-5
Day 2	• Perceptron's and Multilayer Perceptrons	
Day 3	• Activation Functions and Their Roles, Loss Functions	
Day 4	• Case study	
Day 5	• Graded Assignment-1	

Module 2: Mathematics for Deep Learning

Day 6	• Linear Algebra for Deep Learning	Day 6-10
Day 7	• Essential Calculus: Derivatives and Gradients	
Day 8	• Optimization Techniques	
Day 9	• Mathematics in Neural Networks	
Day 10	• Graded Assignment-2	

Module 3: Convolutional Neural Networks

Day 11	• Convolutional Layers and Filters	Day 11-15
Day 12	• Pooling Layers (Max Pooling, Average Pooling)	
Day 13	• Strides & Padding	
Day 14	• Case study	
Day 15	• Graded Assignment-3	

Module 4: Recurrent Neural Networks and Sequences

Day 16	• Introduction to Sequential Data and RNNs	Day 16-20
Day 17	• Long Short-Term Memory Networks (LSTMs)	
Day 18	• Handling Sequential Data for Non-NLP Tasks	
Day 19	• Case study	
Day 20	• Graded Assignment-4	

Module 5: Advanced Topics and Applications

Day 21	• Generative Models: Introduction and Applications	Day 21-25
Day 22	• Generative Adversarial Networks (GANs)	
Day 23	• Advanced Techniques in LSTMs (Bidirectional LSTMs)	
Day 24	• Case study	
Day 25	• Graded Assignment-5	

Module 6- Capstone project

Day 26- 30	• Project	Day 26-30
Day 31	• Project Viva & MCQ test	