

**Fundamentals of Deep Learning**

**Course Number:** NVDA-102EC  
**Duration:** 1 day

**Overview**

This NVIDIA Deep Learning training course teaches attendees the fundamentals of neural networks and how to train image-recognition models, predict text sequences, and classify objects. By the end of this course, students confidently train deep learning models from scratch, using tools and tricks to achieve highly accurate results.

**Prerequisites**

* An understanding of fundamental programming concepts in Python 3, such as functions, loops, dictionaries, and arrays.
* Familiarity with Pandas data structures
* An understanding of how to compute a regression line

**Materials**

All attendees receive official courseware from NVIDIA in electronic format.

**Software Needed on Each Student PC**

The class will be conducted in a remote environment that Accelebrate will provide; students will only need a local computer with a web browser and a stable Internet connection. Any recent version of Microsoft Edge, Mozilla Firefox, or Google Chrome will work well.

**Objectives**

* Grasp the tools and techniques for successful neural network training
* Build your first image-recognition model
* Speed up development by using existing AI libraries
* Train recurrent neural networks to work with sequential data
* Classify objects and build intelligent systems
* Apply new skills to a real-world project

**Outline**

* Introduction
* The Mechanics of Deep Learning
  + Explore the fundamental mechanics and tools involved in successfully training deep neural networks
  + Train your first computer vision model to learn the process of training
  + Introduce convolutional neural networks to improve accuracy of predictions in vision applications
  + Apply data augmentation to enhance a dataset and improve model generalization
* Pre-trained Models and Recurrent Networks
  + Leverage pre-trained models to solve deep learning challenges quickly. Train recurrent neural networks on sequential data
  + Integrate a pre-trained image classification model to create an automatic doggy door
  + Leverage transfer learning to create a personalized doggy door that only lets in your dog
  + Train a model to autocomplete text based on New York Times headlines
* Final Project: Object Classification
  + Apply computer vision to create a model that distinguishes between fresh and rotten fruit
  + Create and train a model that interprets color images
  + Build a data generator to make the most out of small datasets
  + Improve training speed by combining transfer learning and feature extraction
  + Discuss advanced neural network architectures and recent areas of research where students can further improve their skills
* Conclusion