Course Name	Advanced Deep Learning Engineering and Model Optimization
Course Duration	5 Day (40 hours)
Target Audience	Data Analyst, Business Analysts, Data Scientist
Course Outcomes	Learn deep learning concepts and architectures.
	Develop proficiency in TensorFlow for building and training deep neural networks.
	Apply convolutional neural networks (CNNs) to tasks like detection, recognition, and style transfer.
	Build and train recurrent neural networks (RNNs) for tasks like natural language processing (NLP) and utilize transformer models for tasks like named entity recognition (NER) and question answering.

Module No.	Module
1	**Introduction to Deep Learning**
1.1	Introduction to deep learning trends and applications
1.2	Examples of deep learning applications
2	**Neural Network Basics**
2.1	Machine learning problem setup and neural network mindset
2.2	Vectorization for efficient computation
3	**Shallow Neural Network**
3.1	Building a neural network with one hidden layer
3.2	Understanding forward propagation and backpropagation
4	**Deep Neural Network**
4.1	Computation in deep learning
4.2	Building and training deep neural networks for computer vision tasks
5	**Practical Aspects of Deep Learning**
5.1	Initialization methods for deep neural networks
5.2	Regularization techniques to prevent overfitting
6	**Optimization Algorithms**
6.1	Advanced optimization techniques for neural networks
6.2	Random minibatching and learning rate decay
7	**Hyperparameter Tuning, Batch Normalization, Frameworks**
7.1	Introduction to the TensorFlow framework
7.2	Training neural networks on TensorFlow datasets
8	**ML Strategy**
8.1	Strategic guidelines for setting goals and managing ML production workflow
8.2	Error analysis procedures

9	**Foundations of Convolutional Neural Networks**
9.1	Understanding pooling and convolutional layers
9.2	Building deep CNNs for image classification
10	**Deep Convolutional Models: Case Studies**
10.1	Exploring advanced tricks and methods in deep CNNs
10.2	Applying transfer learning to pretrained models
11	**Object Detection**
11.1	Using CNNs for object detection tasks
12	**Face Recognition & Neural Style Transfer**
12.1	Applying CNNs for face recognition tasks
12.1	Implementing neural style transfer for art generation
13	**Recurrent Neural Networks**
13.1	Introduction to recurrent neural networks (RNNs)
13.2	Variants of RNNs for sequential data modeling
14	**Natural Language Processing & Word Embeddings**
14.1	NLP applications with deep learning models
14.2	Word embeddings for text analysis
15	**Sequence Models & Attention Mechanism**
15.1	Enhancing sequence models with attention mechanisms
15.2	Speech recognition and audio data processing
16	**Transformer Network**
16.1	Understanding the functioning of transformer networks