**AI-Deep Learning with Python (60 hrs)**

1. Introduction to Deep Learning

* What are the Limitations of Machine Learning?
* What is Deep Learning?
* Advantage of Deep Learning over Machine learning
* Reasons to go for Deep Learning
* Real-Life use cases of Deep Learning

1. INTRODUCTION TO ARTIFICIAL INTELLIGENCE (AI)

* History of AI
* Modern era of AI
* How is this era of AI different?
* Transformative Changes
* Role of Machine learning & Deep Learning in AI
* Hardware for AI (CPU vs. GPU vs. TPU)
* Software Frameworks for AI
* Deep Learning Frameworks for AI
* Key Industry applications of AI

1. Deep Learning in python

* Overview of important python packages for Deep Learning

1. Overview of TensorFlow

* What is Tensor Flow?
* Tensor Flow code-basics
* Graph Visualization
* Constants, Placeholders, Variables
* TensorFlow Basic Operations
* Linear Regression with Tensor Flow
* Logistic Regression with Tensor Flow
* K Nearest Neighbour algorithm with Tensor Flow
* K-Means classifier with Tensor Flow
* Random Forest classifier with Tensor Flow

1. Neural Networks using TensorFlow

* Quick recap of Neural Networks
* Activation Functions, hidden layers, hidden units
* Illustrate & Training a Perceptron
* Important Parameters of Perceptron
* Understand limitations of A Single Layer Perceptron
* Illustrate Multi-Layer Perceptron
* Back-propagation – Learning Algorithm
* Understand Back-propagation – Using Neural Network Example
* TensorBoard

1. Deep Learning Networks

* What is Deep Learning Networks?
* Why Deep Learning Networks?
* How Deep Learning Works?
* Feature Extraction
* Working of Deep Network
* Training using Backpropagation
* Variants of Gradient Descent
* Types of Deep Networks
* Feed forward neural networks (FNN)
* Convolutional neural networks (CNN)
* Recurrent Neural networks (RNN)
* Generative Adversal Neural Networks (GAN)
* Restrict Boltzman Machine (RBM)

1. Convolutional Neural Networks(CNN)

* Introduction to Convolutional Neural Networks
* CNN Applications
* Architecture of a Convolutional Neural Network
* Convolution and Pooling layers in a CNN
* Understanding and Visualizing a CNN
* Transfer Learning and Fine-tuning Convolutional Neural Networks

1. Recurrent Neural Networks(RNN)

* Intro to RNN Model
* Application use cases of RNN
* Modelling sequences
* Training RNNs with Backpropagation
* Long Short-Term Memory (LSTM)
* Recursive Neural Tensor Network Theory
* Recurrent Neural Network Model

1. Restricted Boltzmann Machine(RBM)

* What is Restricted Boltzmann Machine?
* Applications of RBM
* Collaborative Filtering with RBM
* Introduction to Autoencoders & Applications
* Understanding Autoencoders

1. Deep Learning with Keras

* Define Keras
* How to compose Models in Keras
* Sequential Composition
* Functional Composition
* Predefined Neural Network Layers
* What is Batch Normalization
* Saving and Loading a model with Keras
* Customizing the Training Process
* Using TensorBoard with Keras
* Use-Case Implementation with Keras
* Intuitively building networks with Keras

1. Application of AI

* Computer Vision
* Text Data Processing
* Image processing
* Audio & video Analytics
* Internet of things (IOT)

1. Final Projects

* Computer Vision
* Text Data Processing
* Image processing - PNG, PDF,JPEG, JPG etc.
* Speech analytics - Speech to text / Voice tonality
* Internet of Things - IOT