Course Name: Certificate Course in Artificial Intelligence

Course Objective

The objective of this course is to provide the student with the detailed knowledge of understand the impact of artificial intelligence in various businesses and learn how can you leverage artificial intelligence in your current roles.

Course Prerequisite

Education: Any Engineering, Science, Statistics, Economics Graduate (10+2+3/ 10+2+4) OR higher qualification

Experience: The course does not require any specific knowledge on Artificial Intelligence, Machine Learning, Programming and Mathematics.

Course Outcome

These candidates will be provided an in-depth understanding of artificial intelligence and Deep Learning methodology. After completion of this course, you will be ready to apply the newly acquired skills to drive better business and strategic decisions for your business using AI.

Course Duration: 60 Hrs (4 hours/ day for 3 Weeks)

Course Outline:

S. No.	Course Modules	Duration (Hrs)
1	Foundations Linux and Python	4
2	Introduction to Machine Learning and Deep Learning	4
3	Build end-to-end Machine Learning Project	8
4	Classification	8
5	Machine Learning Algorithms	6
6	Introduction to Artificial Neural Networks with Keras	6
7	Training Deep Neural Networks & Loading and Pre-processing Data with TensorFlow	6
8	Deep Computer Vision & NLP	6
9	RNN & Reinforcement Learning	4
10	AI Mission in Indian, National Mission on Natural Language translation Project & Atal innovation Mission	4
11	Projects	8
	Total	**60**

Detailed Course Content

1. Foundations

- Linux for Data Science/ Machine Learning

- Getting Started with Git

- Python Foundations

- Machine Learning Prerequisites (Including NumPy, Pandas and Linear Algebra)

- Getting Started with SQL

- Statistics Foundations

2. Introduction to Machine Learning and Deep Learning

- Machine Learning algorithms (Supervised, Unsupervised, Reinforcement)

- challenges in Machine Learning

- solving the problems using the traditional approach

- solving the problems using Machine Learning approach

- a brief introduction to both Machine Learning and Deep Learning world

3. Build end-to-end Machine Learning Project
- Data Pre-processing

- we will build a machine learning model for prediction

- machine learning pipelines to build a model

- exploring many different models

- short-list the best one and fine-tuning the selected model

4. Classification
- Train a model on the MNIST dataset to recognize handwritten digits

- Confusion Matrix

- Precision

- Recall

- ROC Curve

5. Machine Learning Algorithms
- Unsupervised Learning,

- Ensemble Learning

- Dimensionality Reduction

6. Introduction to Artificial Neural Networks with Keras

- Artificial Neural Networks, back-propagation

- Multilayer perceptron using Keras and visualize the runs and graphs using Tensor board

7. Training Deep Neural Networks
- we will learn various challenges deep neural networks face while training like vanishing and exploding gradients. We will learn various techniques to solve these problems like reusing pre-trained layers, using faster optimizers and avoiding overfitting by regularization.

- Loading and Pre-processing Data with TensorFlow

8. Deep Computer Vision using Convolutional Neural Network
- Convolutional Neural Networks – CNNs

- Processing Sequences Using RNNs and CNNs

9. **RRNs and Natural Language Processing Concepts**
    • Using Natural Language Processing we build systems that can read and write natural language. In this topic, we will learn different NLP techniques and generate Shakespearean text using a Character RNN.

10. **AI Mission in Indian, National Mission on Natural Language translation Project & Atal innovation Mission**

11. **Projects**