Certificate Course in Artificial Intelligence

Objective of the Course:

Today all are talking about the advancements in AI/ML and how it can introduce changes in the world, with the pace with which it is growing. But other than the basic level knowledge people are unaware of the actual potential and capabilities of Machine Learning and Artificial intelligence technologies.

The objective of this course is to create an awareness of Data Science, Machine learning, and deep learning Tools & Techniques among students so that they can recommend and apply these technologies in real life and at their workplaces.

The course also requires students to hands-on of different AI/ML Tools and implement programming assignments related to all these topics. This course also introduces the techniques and applications of AI in different domains.

Learning Outcomes:

Upon successful completion of this course candidate will able to:

1. Students will be expected to Have a good understanding of the fundamental issues and challenges of data science, machine learning, and deep learning: data, Model, Selection Complexity, etc.
2. Students will be able to understand and implement the strengths and weaknesses of many popular AI/ML/DL algorithms.
3. Appreciate the underlying mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and unsupervised learning.
4. Be able to design and implement various AI/ML/DL algorithms in a range of real-world applications.

Duration of the Course (in hours)	100 Hrs

Eligibility Criteria and pre-requisites, if any	This course is meant for any graduates, Entrepreneurs, Intern, Apprentices, Fresh-Recruits (Offered employment), IT Professionals, Non-IT professionals working in IT Industries, Ex-Employee and Faculties (Spoken). Candidates should have good knowledge of computing and Object oriented concepts.

Course Outline

S. No	Topic	Minimum No. of Hours	
		Theory	**Practical**
1.	**Data Science and Programming Tools** 1.1 Python Data Types and language basics, Python Functions, Modules and Packages, Object Oriented Programming in Python, 1.2 Introduction to Database Management System & SQL, Database Interaction in Python.	20	20

	1.3 Structures and Unstructured data 1.4 Descriptive Statistics 1.5 Probability distribution functions 1.6 Data visualization –Types of graphs 1.7 Data Analysis & visualization – using popular python packages 1.8 Data Preprocessing		

2.	**Machine Learning**
	2.1 Supervised and Unsupervised Learning
	2.2 Classification, Regression & Clustering
	2.3 Linear Algebra
	2.4 Machine Learning Algorithms
	  2.4.1 Linear Regression
	  2.4.2 KNN
	  2.4.3 K Means
	  2.4.4 Logistic Regression
	  2.4.5 Support Vector Machine
	  2.4.6 Decision Tree
	  2.4.7 Naïve Bayes, etc.
	 2.5 Ensemble Methods -Random Forest, Boosting and Optimization, etc.
	  • Model Evaluation Metrics
		14	16

3.	**Deep Learning and Natural Language Processing**
	3.1 Deep Learning Concepts
	  3.1.1 Artificial Neural Network
	3.2 Deep Neural Networks
	  3.2.1 Convolutional Neural Network
	  3.2.2 Recurrent Neural Network
	  3.2.3 OpenCV
	3.3 Natural Language Processing Methods
	  3.3.1 Basics of text processing
	  3.3.2 Lexical processing
	  3.3.3 Parts of Speech Tagging
	  3.3.4 NLP Applications
		12	18

4.	**Soft Skills** 4.1 Verbal/ Non-verbal communication 4.2 Interview skills 4.3 Professional/social etiquettes 4.4 Professional correspondence/ English		
	Total Hours:	**46**	**54**
		100	

Recommended Hardware/tools:	Any system with at least 4-6 physical core (either i5 / i7), decent amount of GPU (Nvidia GTX10 series) and at least 8 GB of RAM.

Recommended Software:	Python, D3.js, Tableau, TensorFlow, Apache Mohut, Apache, Spark ML, H2O.AI, Neural Designer, H2O.ai, DeepLearningKit, Microsoft Cognitive Toolkit, Keras, ConvNetJS, Torch.