

1	MACHINE LEARNING AND AI SENSITIZATION	HOURS
1.1 Dealing with Jargons - Data, Statistical Modeling, Data Mining, Machine Learning,NLP, Artificial Intelligence, Analytics (Predictive & Prescriptive), Deep Learning, Supervised Learning, Unsupervised Learning, Reinforcement Learning, Q Learning	2	
1.2 What is ML?	1	
1.3 Why is it required?	1	
1.4 Examples / Videos	1	
1.5 Use Cases	1	
1.6 Tools Used	0.5	
1.7 R vs Python - Which is better?	0.5	
1.8 TensorFlow vs Keras vs TFLearn	1	

|| DESCRIPTION ||

This section of the course provides a sensitization as well as an in depth explanation on what is Machine Learning and Artificial Intelligence. Given Harvard's latest publication the hottest job of the 21st century is "Data Scientist". But what exactly is a data scientist? What is the job role? What concepts do you need to know to become a successful data scientist? What projects do you undertake as a data scientist and what is the methodology? What business use cases do you solve or create using data science? This section helps you understand answers to questions like these and more specifically helps you understand what do all the jargons listed actually mean - because once you start to search information about data science you come across all such jargons. There is so much information on the web that it is very easy to get confused. So in a nutshell, this section helps you understand and take a grasp of the 3 fundamental questions of Data Science - What is it? Why is it required? and How is it done?

2	DEEP DIVING INTO MACHINE LEARNING	HOURS
2.1 ML Theory	3	
2.2 Statistical Concepts	15	
2.3 Algorithms (Theory and Practical for each) - Regression (SLR, MLR, Logistic), Naïve Bayes, SVM, Customer Choice Modeling, Association Rule Mining, Clustering (K-means, Hierarchical)	15	

|| DESCRIPTION ||

Machine Learning Certification Training using R helps you gain expertise in various machine learning algorithms such as regression, clustering, decision trees, random forest, SVMs & Naïve Bayes. This Machine Learning Training exposes you to concepts of Statistics, Time Series and different classes of machine learning algorithms like supervised, unsupervised and reinforcement algorithms. Throughout the Data Science Certification Course, you'll be given hands on practices on various projects and datasets. Moreover, you are given the freedom to bring in your projects / datasets and the trainer will assist you in that too! You will also get to know what situation / business problem requires which algorithms to be used. All the details of an algorithm such as the hyperparameters, smoothing, regularization, cross validation, confusion matrix, optimization of your algorithms to achieve better outputs or increased accuracy are all a part of this section of the course.

3 DEEP DIVING INTO ARTIFICIAL INTELLIGENCE HOURS

3.1 AI Theory - What is AI? How is it different from ML?

(3)

DESCRIPTION

In this module, you'll get an introduction to Deep Learning and understand how Deep Learning solves problems which Machine Learning cannot. Understand fundamentals of Machine Learning and relevant topics of Linear Algebra and Statistics.

TOPICS:

- Deep Learning: A revolution in Artificial Intelligence
- Limitations of Machine Learning
- What is Deep Learning?
- Advantage of Deep Learning over Machine learning
- Top Reasons to go for Deep Learning
- Real-Life use cases of Deep Learning
- Review of Machine Learning: Regression, Classification, Clustering, Reinforcement Learning, Underfitting and Overfitting, Optimization"

3.2 History

(3)

3.3 Fundamentals

(2)

3.4 Neural Networks - Working and Calculations

(3)

DESCRIPTION

In this module, you'll get an introduction to Neural Networks and understand its working i.e. how it is trained, what are the various parameters considered for its training and the activation functions that are applied.

TOPICS:

- How Deep Learning Works?
- Activation Functions
- Illustrate Perceptron
- Training a Perceptron
- Important Parameters of Perceptron
- What is TensorFlow?
- TensorFlow code-basics
- Constants, Placeholders, Variables
- Creating a Model
- Understand limitations of a Single Perceptron
- Understand Neural Networks in Detail
- Illustrate Multi-Layer Perceptron
- Backpropagation – Learning Algorithm
- Understand Backpropagation – Using Neural Network Example
- MLP Digit-Classifier using TensorFlow
- Why Deep Networks
- Why Deep Networks give better accuracy?
- Use-Case Implementation on SONAR dataset
- Understand How Deep Network Works?
- How Backpropagation Works?
- Illustrate Forward pass, Backward pass
- Different variants of Gradient Descent
- Types of Deep Networks



HOURS

(2)

3.5 Recurrent Neural Networks and LSTMs

DESCRIPTION

In this module, you'll understand Recurrent Neural Networks and its applications. You will understand the working of RNN, how LSTM are used in RNN, what is Recursive Neural Tensor Network Theory, and finally you will learn to create a RNN model.

Topics:

- Introduction 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

(2)

3.6 Convolutional Neural Networks

DESCRIPTION

In this module, you'll understand convolutional neural networks and its applications. You will learn the working of CNN, and create a CNN model to solve a problem.

TOPICS:

- Introduction to CNNs
- CNNs Application
- Architecture of a CNN
- Convolution and Pooling layers in a CNN
- Understanding and Visualizing a CNN

(2)

3.7 Autoencoders and Restricted Boltzmann Machines

DESCRIPTION

In this module, you'll understand RBM & Autoencoders along with their applications. You will understand the working of RBM & Autoencoders, illustrate Collaborative Filtering using RBM and understand what are Deep Belief Networks.

TOPICS:

- Restricted Boltzmann Machine
- Applications of RBM
- Collaborative Filtering with RBM
- Introduction to Autoencoders
- Autoencoders applications
- Understanding Autoencoders

4	VISUALIZATION TOOL	HOURS
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4.1 Tensorboard for Visualization	0.5
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DESCRIPTION	
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In this module you will learn how to use Tensorboard for visualization of the computational data graphs that TensorFlow constructs for any deep learning project.

5	INDUSTRY EXPECTATIONS AND TIPS	HOURS
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5.1 How to approach a ML / AI problem?	1
5.2 What is Data Science?	0.5
5.3 Indicators of an Excellent Data Scientist?	0.5
5.4 Interview Tips and Practice - What to say and what NOT to say?	0.5
5.5 Managing salary expectations	0.5
5.6 Undercommitment and Overdelivery	0.5

DESCRIPTION	
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Self Explanatory. Tips on cracking interviews, career changes, salary expectations, job roles, different designations, various companies hiring etc.

6	HANDS ON PROJECTS	HOURS
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6.1 Sentiment Analysis	1
6.2 Building Chatbot	1
6.3 Image Classification	1
6.4 Handwritten Digits Identification	1
6.5 Speech to Text Engine	1
6.6 Training a Gamebot	1
6.7 Building a Recommendation Engine	1
6.8 Creating music with Unsupervised Learning	1
6.9 Generating Text in your own writing style	1
6.10 Object Detection in live video feed, webcam, video files or Youtube	1

DESCRIPTION	
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These are the hands on projects focusing on the top 10 most sought after skills required by the companies in the market and the top 10 use cases that the industry is working on to resolve. Understanding the codes for these use cases and understanding the implementation of these will help you gain an edge in the industry as well as help you customize any project that you may undertake in the AI domain.