

# Artificial Intelligence, Machine Learning & Tableau



"Change is the end result of all true learning."

ZebLearn is an ISO 9001-2015 Certified Company that is co-founded by highly experienced industry professionals and alumni of top universities. It is headquartered at Noida & It is one of the fastest-growing solution providers in the field of Education, IT, Consulting and Corporate Trainings.







## Artificial Intelligence Syllabus

## **Artificial Intelligence Foundation**

- Introduction To Artificial Intelligence (AI)
- Al Data Strategy
- Al Ethics
- Issues And Concerns
- Al Challenges
- Use Cases And Adoption

#### Tensorflow 2.X Platform

- Tensorflow Introduction
- Tensorflow Basic Concepts
- Installation And Basic Operations In Tf 2.X,Tf 2.0 Eager
- Mode, Tensorflow 2.X Keras

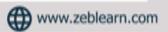
## Core Learning Algorithms

- Core Learning Algorithms Introduction
- Regression With Tensorflow
- Classification With Tensorflow

#### **Neural Networks**

- Structure Of Neural Networks,
- Neural Network Core Concepts
- Feed Forward Algorithm
- Backpropagation
- Building Neural Network From Scratch Using Numpy





## Artificial Intelligence Syllabus

## Implementing Deep Neural Networks

- Introduction To Neural Networks With Tf2.X
- Simple Deep Learning Model In Keras (Tf2.X)
- Building Neural Network Model In Tf 2.0 For Mnist Dataset

## Deep Computer Vision - Convolutional Neural Networks

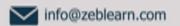
- Convolutional Neural Networks (Cnns) Introduction
- Cnns With Keras
- Transfer Learning In Cnn
- Style Transfer, Flowers Dataset With Tf2.X
- Examining X-Ray With Cnn Model

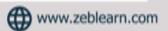
#### Recurrent Neural Network

- Rnn Introduction
- Sequences With Rnns
- Long Short-Term Memory Networks (Lstm Rnns) And Gru
- Examples Of Rnn Applications

### **Natural Language Processing**

- Natural Language Processing Introduction,
- NLP With Rnns
- Creating Model
- Transformers And Bert
- State Of Art Nlp And Projects





## Artificial Intelligence Syllabus

## Reinforcement Learning

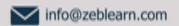
- Markov Decision Process
- Fundamental Equations In R,
- Model Based Method
- Dynamic Programming Model Free Methods

## Deep Reinforcement Learning

- Architectures Of Deep Q Learning
- Deep Q Learning
- Policy Gradient Methods

## Generative Adversarial Network (Gan)

- Gan Introduction
- Core Concepts Of Gan
- Building Gan Model With Tensorflow 2.X
- Gan Applications



## **Machine Learning Syllabus**

## **Introduction to Machine Learning**

- Need of Machine Learning
- Introduction to Machine Learning
- Types of Machine Learning, such as supervised, unsupervised, and reinforcement learning, Machine Learning with Python, and the applications of Machine Learning

## Supervised Learning and Linear Regression

- Introduction to supervised learning and the types of supervised learning, such as regression and classification
- Introduction to regression
- Simple linear regression
- Multiple linear regression and assumptions in linear regression
- Math behind linear regression

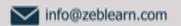
## Classification and Logistic Regression

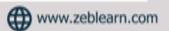
- Introduction to classification
- Linear regression vs logistic regression
- Math behind logistic regression, detailed formulas, the logit function and odds, confusion matrix and accuracy, true positive rate, false positive rate, and threshold evaluation with ROCR

### **Decision Tree and Random Forest**

- Introduction to tree-based classification
- Understanding a decision tree, impurity function, entropy, and understanding the concept of information gain for the right split of node
- Understanding the concepts of information gain, impurity function, Gini index, overfitting, pruning, pre-pruning, post-pruning, and cost-complexity pruning
- Introduction to ensemble techniques, bagging, and random forests and finding out the right number of trees required in a random forest







## **Machine Learning Syllabus**

## Naïve Bayes and Support Vector Machine (self-paced)

- Introduction to probabilistic classifiers
- Understanding Naïve Bayes and math behind the Bayes theorem
- Understanding a support vector machine (SVM)
- Kernel functions in SVM and math behind SVM

## **Unsupervised Learning**

- Types of unsupervised learning, such as clustering and dimensionality reduction, and the types of clustering
- Introduction to k-means clustering
- Math behind k-means
- Dimensionality reduction with PCA

## Natural Language Processing and Text Mining (self-paced)

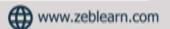
- Introduction to Natural Language Processing (NLP)
- Introduction to text mining
- Importance and applications of text mining
- How NPL works with text mining
- Writing and reading to word files
- Language Toolkit (NLTK) environment
- Text mining: Its cleaning, pre-processing, and text classification

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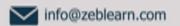
## **Machine Learning Syllabus**

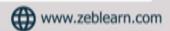
## Introduction to Deep Learning

- Introduction to Deep Learning with neural networks
- Biological neural networks vs artificial neural networks
- Understanding perception learning algorithm, introduction to Deep Learning frameworks, and TensorFlow constants, variables, and place-holders

## Time Series Analysis (self-paced)

- What is time series? Its techniques and applications
- Time series components
- Moving average, smoothing techniques, and exponential smoothing
- Univariate time series models
- Multivariate time series analysis
- ARIMA model and time series in Python
- Sentiment analysis in Python (Twitter sentiment analysis) and text analysis





#### Introduction to Data Visualization and Power of Tableau

- What is data visualization?
- Comparison and benefits against reading raw numbers
- Real use cases from various business domains
- Some quick and powerful examples using Tableau without going into the technical details of Tableau
- Installing Tableau
- Tableau interface
- Connecting to Data Source
- Tableau data types
- Data preparation

#### Architecture of Tableau

- Installation of Tableau Desktop
- Architecture of Tableau
- Interface of Tableau (Layout, Toolbars, Data Pane, Analytics Pane, etc.)
- How to start with Tableau
- The ways to share and export the work done in Tableau

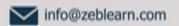
#### **Hands-on Exercise:**

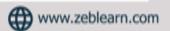
- Play with Tableau desktop
- Learn about the interface
- Share and export existing works

### Working with Metadata and Data Blending

- Connection to Excel
- Cubes and PDFs
- Management of metadata and extracts
- Data preparation
- Joins (Left, Right, Inner, and Outer) and Union







Dealing with NULL values, cross-database joining, data extraction, data blending, refresh extraction, incremental extraction, how to build extract, etc.

#### **Hands-on Exercise:**

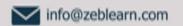
- Connect to Excel sheet to import data
- Use metadata and extracts
- Manage NULL values
- Clean up data before using
- Perform the join techniques
- Execute data blending from multiple sources

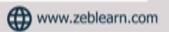
### **Creation of Sets**

- Mark, highlight, sort, group, and use sets (creating and editing sets, IN/OUT, sets in hierarchies)
- Constant sets
- Computed sets, bins, etc.

#### **Hands-on Exercise:**

- Use marks to create and edit sets
- Highlight the desired items
- Make groups
- Apply sorting on results
- Make hierarchies among the created sets





## Working with Filters

- Filters (addition and removal)
- Filtering continuous dates, dimensions, and measures
- Interactive filters, marks card, and hierarchies
- How to create folders in Tableau
- Sorting in Tableau
- Types of sorting
- Filtering in Tableau
- Types of filters
- Filtering the order of operations

#### **Hands-on Exercise:**

- Use the data set by date/dimensions/measures to add a filter
- Use interactive filter to view the data
- Customize/remove filters to view the result

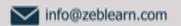
### Organizing Data and Visual Analytics

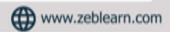
- Using Formatting Pane to work with menu, fonts, alignments, settings, and copy-paste
- Formatting data using labels and tooltips
- Edit axes and annotations
- K-means cluster analysis
- Trend and reference lines
- Visual analytics in Tableau
- Forecasting, confidence interval, reference lines, and bands

#### **Hands-on Exercise:**

- Apply labels and tooltips to graphs, annotations, edit axes' attributes
- Set the reference line
- Perform k-means cluster analysis on the given dataset







## Working with Mapping

- Working on coordinate points
- Plotting longitude and latitude
- Editing unrecognized locations
- Customizing geocoding, polygon maps, WMS: web mapping services
- Working on the background image, including add image
- Plotting points on images and generating coordinates from them
- Map visualization, custom territories, map box, WMS map
- How to create map projects in Tableau
- Creating dual axes maps, and editing locations

#### **Hands-on Exercise:**

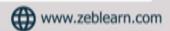
- Plot longitude and latitude on a geo map
- Edit locations on the geo map
- Custom geocoding
- Use images of the map and plot points
- Find coordinates
- Create a polygon map
- Use WMS

## Working with Calculations and Expressions

- Calculation syntax and functions in Tableau
- Various types of calculations, including Table, String, Date, Aggregate, Logic, and Number
- LOD expressions, including concept and syntax
- Aggregation and replication with LOD expressions
- Nested LOD expressions
- Levels of details: fixed level, lower level, and higher level
- Quick table calculations







- The creation of calculated fields
- Predefined calculations
- How to validate

### Working with Parameters

- Creating parameters
- Parameters in calculations
- Using parameters with filters
- Column selection parameters
- Chart selection parameters
- How to use parameters in the filter session
- How to use parameters in calculated fields
- How to use parameters in the reference line

#### **Hands-on Exercise:**

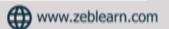
- Creating new parameters to apply on a filter
- Passing parameters to filters to select columns
- Passing parameters to filters to select charts

## **Charts and Graphs**

- Dual axes graphs
- Histograms
- Single and dual axes
- Box plot
- Charts: motion, Pareto, funnel, pie, bar, line, bubble, bullet, scatter, and waterfall charts
- Maps: tree and heat maps
- Market basket analysis (MBA)
- Using Show me
- Text table and highlighted table







#### **Hands-on Exercise:**

- Plot a histogram, tree map, heat map, funnel chart, and more using the given dataset
- Perform market basket analysis (MBA) on the same dataset

#### **Dashboards and Stories**

- Building and formatting a dashboard using size, objects, views, filters, and legends
- Best practices for making creative as well as interactive dashboards using the actions
- Creating stories, including the intro of story points
- Creating as well as updating the story points
- Adding catchy visuals in stories
- Adding annotations with descriptions; dashboards and stories
- What is dashboard?
- Highlight actions, URL actions, and filter actions
- Selecting and clearing values
- Best practices to create dashboards
- Dashboard examples; using Tableau workspace and Tableau interface
- Learning about Tableau joins
- Types of joins
- Tableau field types
- Saving as well as publishing data source
- Live vs extract connection
- Various file types

#### **Hands-on Exercise:**

- Create a Tableau dashboard view, include legends, objects, and filters
- Make the dashboard interactive
- Use visual effects, annotations, and descriptions to create and edit a story







## AI, ML & Tableau Syllabus

