



# Data Science, Machine Learning & Artificial Intelligence Using Codeless Methodology

## Course Outline

Course Code	Duration	Course Fee
DS2020-IIIT/ DS2020-LU	60 Hours (6 Weeks)	INR 19,500/- India Participants USD \$300/-International Participants

### Participants Profile

The course is intended for both freshers and experienced professionals who intend to upgrade their skills and transition to the exciting and most promising field of Data Science, Machine Learning and Artificial Intelligence.

Currently data scientists are in high demand as organizations desperately need professionals who can organize and analyse the astonishing amount of data that is being generated from various sources.

While the course will help freshers to launch their career in this field, it will also enable professionals already in managerial roles to pivot their career for the new digital age.

### Instructor Profile

**Srinivas Rao**, the Course Instructor is an Engineering Post Graduate from IIT Chennai and an MBA from IIM Kozhikode. He is a practicing Data Scientist with an overall experience of 25+ years in diverse domains such as Public Sector, Finance, Retail, Biometrics, Health, Manufacturing and Energy Sectors. He currently works on building Machine Learning and AI solutions in sectors such as Retail, Manufacturing and Energy sectors.



## Course Description

The course introduces participants to mathematics and statistics from a data science perspective. The participants are then introduced to various machine learning algorithms like linear regression, logistic regression, decision trees, naïve bayes, Principal Component Analysis etc. Participants are then taught deep learning algorithms like ANN, CNN etc.

All the concepts taught will be followed by hands on exercises using tools like excel and codeless methodologies. A unique feature of the course is the use of codeless methodologies eliminating the need for learning programming languages like Python or R which by themselves take several months to learn and become hands on.

The codeless methodology will enable participants to quickly understand the concepts and get hands-on experience on applying the algorithms learned during the course.

## Course Learning Outcomes

Upon completion of this course participants will be able to:

1. Get a deep understanding of the concepts of maths and statistics relevant to data science.
2. Understand the importance of data preparation including feature engineering and feature extraction and how to handle them.
3. Get insights into the most prominent Machine Learning and AI algorithms and develop the skills to analyse the problems and build models.
4. Get insights into the concepts behind Deep Learning and Neural Networks.



## Unique Teaching-Learning Process

### 4-C methodology

- Understand the **C**oncept behind every machine learning and AI algorithm
- Understand the **C**ontext in which the algorithms are used.
- Solve a **C**ase study / Use Case by applying the algorithm
- Solve using the **C**odeless methodology

The course follows a unique design to provide sound conceptual knowledge delivered through engaging live online sessions accompanied by home assignments which provide scope for analysing problems and solving them using the conceptual knowledge learnt during the course.

Finally, the participants work on problems similar to those being solved in the industry. The total time that the participants are expected to spend to complete the course is approximately 60 hours which can further be roughly divided into 25 hours for know-how component, 25 hours for do-how component and 10 hours for show-how component.

The course duration of 60 hours (for 6 weeks) is typically divided as follows:

- Classroom delivery: 25 hours
- Self-study and assignments: 25 hours
- Project work: 10 hours

### Learning Modules/Media Library

Links consisting of powerpoint presentations, notes, white papers/articles, video clippings etc to illustrate concepts from the class are shared here. Participants can use the discussion board in LMS to start discussion threads / post doubts / questions. Initiation of discussion/debate on at least two topics by each participant is highly desirable and appreciated.

Week	Topic
Week 1	<p><b>Module 1:</b></p> <p><b>Introduction to Big Data, Data Science / ML / AI &amp; the Codeless Methodology</b></p> <p>The participants will be introduced to Big Data, Data Science, Machine Learning and Artificial Intelligence. They will learn about the different</p>



	<p>types of data, data attributes, classification of data, different stages of Analytics and the CRISP DM Methodology.</p> <p>In addition to the above topics, the participants will be introduced to the codeless methodology.</p> <p><b>Assignments / Exercises:</b></p> <ol style="list-style-type: none"> <li>1. Exercises in Differentiating between different types of data</li> <li>2. Exercises in Data Cleaning / Preparation - Outlier Analysis, Missing Values Imputation Techniques, Data Transformations</li> </ol>
Week 1	<p><b>Module 2:</b></p> <p>Concepts in Maths, Probability and Statistics, Exploratory Data Analysis, Measures of Central Tendency, Measures of Dispersion.</p> <p>Visualization techniques - Learn about line plots, box plots, scatter plots, distributions, heat maps.</p> <p><b>Assignments / Exercises:</b></p> <ol style="list-style-type: none"> <li>1. Hands on exercises in Excel and the Codeless Methodology</li> <li>2. Hands on exercises in Visualization using Excel and the Codeless Methodology</li> </ol>
Week 2	<p><b>Module 3:</b></p> <p>Probability Distribution, Poisson Distribution, Binomial Distribution, Normal Distribution, Central Limit Theorem, Confidence limits, Hypothesis testing, the Four Hypothesis Tests, Inferential Statistics</p> <p><b>Assignments / Exercises:</b></p> <p>Hands on exercises in Excel and Projects using the Codeless Methodology</p>
Week 2	<p><b>Module 4:</b></p> <p>Introduction to Supervised Learning, Principles of Regression, Linear Regression, Multiple Linear Regression, Logistic Regression, Confusion Matrix, ROC analysis</p> <p><b>Assignments / Exercises:</b></p> <p>Hands on exercises / projects in Linear Regression, Multiple Regression and Logistic Regression using the Codeless Methodology.</p>



Week 3	<b>Module 5:</b>  Unsupervised Learning, Clustering, K-Means clustering, DB Scan and other clustering techniques  <b>Assignments / Exercises:</b>  Hands on exercises using the Codeless methodology
Week 3	<b>Module 6:</b>  Decision Trees & Random Forests, Ensemble techniques, Bagging and Boosting  <b>Assignments / Exercises:</b>  Hands on exercises / projects using the Codeless methodology
Week 4	<b>Modules 7 &amp; 8:</b>  Naïve Bayes Classifier, Introduction to Dimensionality Reduction, Eigen Values and EigenVectors, Orthogonality, Principal Component Analysis.  <b>Assignments / Exercises:</b>  Hands on exercises / projects using the Codeless methodology
Week 5	<b>Modules 9 &amp; 10:</b>  Neural Networks, Artificial Neuron, Perceptron, Building blocks of a Neural Networks, Artificial Neural Networks, Convolutional Neural Networks.  <b>Assignments / Exercises:</b>  Hands on exercises / projects using the Codeless methodology
Week 6	<b>Final Project</b>



### Evaluation of Participants

Participants will be graded on a pass-fail scale based upon their course participation, weekly assignments and final project. Participants will be asked to post a brief reaction to each weekly topics.

Final Project: Finally, the participants are required to work on a project and submit a brief project report.

### Feedback and Comments

In order to demonstrate understanding of the concepts taught in the course, participants will be asked to write a brief summary of each week's topics. Your response to these questions should be one paragraph to one page maximum.

### Contact

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***(\* All sessions will be of 150 minutes duration and excludes the previous weeks discussion of 30 minutes)***