



# Advanced Computing and Communications Society presents

# Mathematical Foundation for Machine Learning

(PART 1 - LINEAR ALGEBRA)

## A CERTIFICATE COURSE

### About the course

Machine Learning, Data Science, the buzzwords for a decade now, depends extensively on Linear Algebra, Probability and Statistics, Optimization techniques.

Linear Algebra is an important math skill in machine learning and beginners interested in data science must familiarize themselves with essential concepts in linear algebra. With Linear Algebra playing a predominant role in many applications, this course focuses on foundations of Linear Algebra and in a way what Sheldon Axler calls it as "Linear Algebra Done Right".

During the course, the participants will be exposed to geometric perspective to linear algebra and key ideas of vector spaces and basis, eigen decomposition, singular value decomposition along with applications.

This on-line course presents live lectures, tutorials, assignments and visualizations / demonstrations in addition to regular assessments and final certification exam.

### Course Contents

#### 01

System of Equations and Interpretation in terms of column vectors, elementary row operations – geometric interpretations and applications

#### 02

Vector Spaces, Subspaces, Linear Independence, Basis, Dimension, Linear Transformations, Orthogonality and Gram-Schmidt Orthonormalization algorithms,

#### 03

Real symmetric matrices, diagonalization, Singular value decomposition.

#### 04

Applications of Linear Algebra including PCA, Data Compression, Data Sciences and others

### Course Instructors



#### Dr. Ashok Rao

Dr. Ashok Rao, was formerly Head, Networking Project at the Centre for Electronics Design and Technology, IISc Bangalore. His research interests include Signal Processing, Machine Learning and Applications, Archeology etc. He has also served as Visiting Faculty at the various Indian Institute of Management campuses across the country. Currently he is serving as the Director, National Institute of Engineering, Mysuru.



#### Dr. Arulalan Rajan

Dr. Arulalan Rajan earned his PhD from the Centre for Electronics Design and Technology, Indian Institute of Science (IISc), Bangalore. He was formerly an Assistant Professor at NIT, Surathkal, Karnataka during the period 2013-2019. He is a Faculty in the Proficiency Programme of the Centre for Continuing Programme, IISc Bangalore. His research interests include Integer Sequences, Patterns, Applied Mathematics involving Linear Algebra, Probability and Statistics, Number Theory, etc.

#### COURSE DURATION



## 45 HOURS

### 5 Weekend Course

(Starts 21<sup>st</sup> August, Saturday)

#### COURSE FEE



## ₹9000+ applicable taxes

✓ **20% Discount** for Life Members

✓ **10% Discount** for Student & Annual Members

✓ **10% Discount** for Groups of more than 5\*

\*Conditions apply. Contact us for group discount eligibility

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**Advanced Computing and Communications Society**

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