

## DEPARTMENT OF MATHEMATICS

### REPORT ON VALUE ADDED COURSE CONDUCTED FROM 12<sup>TH</sup> OCTOBER 2021 TO 4<sup>TH</sup> JANUARY 2022

**Title:** Linear Algebra and singular value decomposition

**Date:** 12/10/2021 to 04/01/2022

**Venue:** Room Number: 309

**Participants:** 2<sup>nd</sup> year B.Sc(EMCs) students.

**Resource Person:** Mr. K.Ravindranath

**Number of Students:** 22

**Event Co-Ordinator:** Mrs. Thulasi.R.Mudakavi

**Objective:** The value added course is designed to provide Basic knowledge of Linear Algebra. The objective of this value added course is to provide computational proficiency involving procedures in linear algebra, to understand and construct simple proofs and to solve problems that apply linear algebra to chemistry, economics and engineering.

Department of Mathematics organized value added course on Applications of Linear Algebra from 12<sup>th</sup> October 2021 to 4<sup>th</sup> January 2022 for the students of 2<sup>nd</sup> year B.Sc(EMCs). The value added course was inaugurated by Dr.A.Nagarathna, Principal under the patronage of Sri.M.R. Janakiram (Honorable Director, Gokula Education Foundation), Sri.M.R.Kodandaram (Honorable Director, Gokula Education Foundation) and Sri.Ramprasad (Chief Executive, Gen Science, Gokula Education Foundation). The resource person to the course was Mr. K.Ravindranath. This programme was conducted for 30 hrs.

The registration process started on 7th October 2021. The program started at 2:45pm on 12th October 2021 followed by the inauguration and then the sessions began with the brief introduction of the resource person and few words delivered by principal madam.

The session started with basics such as vectors, binary operations, distributive law, associative law, Groups etc. He explained about solving systems of linear equations, using technology to facilitate row reduction, definition of vector space, basics problems, miscellaneous problems, properties, theorems. Definition of sub space, basics problems, miscellaneous problems, properties, theorems were explained. Linearly dependent, independent vectors, spanning, basis dimensions, rank and nullity theorem,

The following are the topics covered in the sessions:

1. The basic arithmetic operations on vectors and matrices, including inversion and determinants, using technology where appropriate.
2. Solving systems of linear equations, using technology to facilitate row reduction;
3. The basic terminology of linear algebra in euclidean spaces, including linear independence, spanning, basis, rank, nullity, subspace, and linear transformation;
4. The abstract notions of vector space and inner product space;
5. Finding eigenvalues and eigenvectors of a matrix or a linear transformation, and using them to diagonalize a matrix;
6. Singular Value Decomposition (SVD) of a matrix i.e a factorization of that matrix into three matrices.

The main conclusion of this course was connected with the enhancing of students understanding of mathematics and their interest in mathematical subjects in general.

**Outcome:**

**[1] Understand and learn the concepts of vector space and subspace.**

**[ 2 ]Understand and learn the concepts of linear independence, span, and basis.**

**[ 3 ] Understand and learn the concepts of eigenvalues and eigenvectors and solve eigenvalue problems.**

**[ 4 ] Apply principles of matrix algebra to linear transformations.**

**Value Added Course on “Linear Algebra and Singular value decomposition” Photos :**

