BASIC LINEAR ALGEBRA

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IIT Bombay

TYPE OF COURSE: Rerun | Core | UG
COURSE DURATION: 8 weeks (15 Feb’21 - 09 Apr’21)
EXAM DATE: 25 April 2021

PRE-REQUISITES: Nil
INTENDED AUDIENCE: B.Tech, B.Sc., M.Sc (maths), BA/MA Economics/Statistics students
INDUSTRIES APPLICABLE TO: Basic mathematics at school level /undergraduate level

COURSE OUTLINE:
Linear Algebra is a basic course for students intended to go for Engineering studies and higher studies in Mathematics. We will cover the basic tools needed in these branches.

ABOUT INSTRUCTOR:
Prof. I K Rana is a Emeritus Fellow at Department of Mathematics, IIT Bombay. He had taught courses at B.Tech, M.Sc., and Ph.D level for the last 34 years.

COURSE PLAN:
Week 1: Matrices and Matrix operations, REF
Week 2: Linear systems, Gauss Elimination and Inverse of a matrix
Week 3: \( \mathbb{R}^n \); subspaces, linear independence, rank of a matrix
Week 4: Determinants, rank, inveribility
Week 5: Linear transformations, rank-nullity
Week 6: Inner product spaces, Gram-Schmidt process
Week 7: Eigenvalues and Eigenvectors
Week 8: Similarity, diagonalization and applications