



MATHEMATICS

BASIC LINEAR ALGEBRA



PROF. I.K. RANA

Department of Mathematics
IIT Bombay

TYPE OF COURSE	: New Core UG	COURSE DURATION	: 8 weeks (28 Jan'19 - 22 Mar'19)
INTENDED AUDIENCE	: B.Tech, B.Sc., M.Sc (maths) , BA/MA Economics/Statistics	EXAM DATE	: 31 Mar 2019
PRE-REQUISITES	: Basic mathematics at school level		

COURSE OUTLINE :

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

ABOUT INSTRUCTOR :

After working as a Professor at IITBombay from 1984-2015, he rejoined as Emeritus Fellow at IITB. He is president of AMTI (The Association of Mathematics Teachers of India) and has supervised three Ph.D. students and authored 4 books:

- 1) "Introduction to measure and Integration" AMS Graduate Studies in Mathematics Volume 45, 2000."
- 2) "From Numbers to Analysis" World Scientific Press, 1998"
- 3) "Calculus @IITB, Concepts and Examples", math4all, India, 2007
- 4) "From Geometry to Algebra: A course in Linear Algebra" Ane Books, India, 2007

COURSE PLAN :

- Week 01** : Matrices and Matrix operations, REF
- Week 02** : Linear systems, Gauss Elimination and Inverse of a matrix
- Week 03** : R^n ; subspaces, linear independence, rank of a matrix
- Week 04** : Determinants, rank, invertibility
- Week 05** : Linear transformations, rank-nullity
- Week 06** : Inner product spaces, Gram-Schmidt process
- Week 07** : Eigenvalues and Eigenvectors
- Week 08** : Similarity, diagonalization and applications