LINEAR ALGEBRA

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Kerala School of Mathematics

TYPE OF COURSE : Rerun | Core | UG
COURSE DURATION : 12 weeks (24 Jan' 22 - 15 Apr' 22)
EXAM DATE : 23 Apr 2022

INTENDED AUDIENCE : Undergraduate students in various universities.
INDUSTRIES APPLICABLE TO : Almost all engineering based companies

COURSE OUTLINE :
Linear Algebra is a foundational subject in Mathematics which is of fundamental importance in the development of almost every branch of Mathematics, Theoretical Physics and Computer Science. A good understanding of the subject is also crucial to the study of most Engineering disciplines and many problems in Social Sciences. Linear Algebra can be succinctly described as the study of Linear Transformations and its algebraic properties. This course is an introduction to Linear Algebra

ABOUT INSTRUCTOR :
Prof. Pranav Haridas is a Assistant Professor at the Kerala School of Mathematics. His research interests broadly lie in Complex Analysis and more specifically quadrature domains in several complex variables. He is also interested in the study of quasiconformal mappings and Teichmller spaces. He completed his doctoral studies from the Indian Institute of Sciences, Bangalore

COURSE PLAN :

Week 1: Vectors, vector spaces, span, linear independence, bases

Week 2: Dimension, linear transformations

Week 3: Null spaces, range, coordinate bases

Week 4: Matrix multiplication, Invertibility, Isomorphisms

Week 5: Coordinate change, products and quotients of vector spaces, duality

Week 6: Review of elementary row operations, rank, determinants

Week 7: Eigenvalues, Eigenvectors

Week 8: Diagonalization

Week 9: Characteristic polynomials, inner products and norms

Week 10: Orthogonal bases, orthognalization, orthogonal complements

Week 11: Adjoints, normal and self-adjoint operators

Week 12: Spectral theorem for normal and self-adjoint operators