AiCore - Linear Algebra Course Syllabus

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Pre-Requisites: Basic understanding of functions(domains and ranges).

Syllabus:

- Vector Space Theory: Finite Dimensional Spaces, Linear Combinations and Indepedence, Basis, Norms, Inner products, Orthogonality.
- Matrix Theory: Linear Mappings, Matrices of Linear Maps, Matrix operations and notations, Transpose and Inverse Matrices, Eigenvalues and Eigenvectors, Projections onto an n-dimensional Vector Space.

Applications:

- Convolutional Neural Networks are used for classifying data into categories, for example: if we wanted to create a model to recognise hand written digits from 0-9. Building Neural Networks requires an understanding of matrix multiplication, and the shorthand notations for writing out complex matrix operations.
- Linear Regression with a relatively small amount of data, utilises inverses and transpositions of matrices.
- Principal Component Analysis (PCA): One of the more complex algorithms with regards to linear Algebra. Uses pretty much all theory presented above, with importance on inner products, projections, eigenvectors.