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# *Linear Algebra for Data Science*

*1 credit courses I-IV:*

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**I: LINEAR ALGEBRA FOR DATA SCIENCE PRIMER.** THIS COURSE IS INTENDED FOR THE MOTIVATED BEGINNER, AND WILL ALSO SERVE TO AS A FAST-PACED REFRESHER COURSE. IT COVERS THE FUNDAMENTAL SUBSPACES, BASES AND PROJECTIONS. IT IS OFFERED ON-LINE ONLY AND SERVES AS A PREREQUISITE TO COURSES II-IV.

**II: GEOMETRIC TECHNIQUES FOR DATA REDUCTION: EIGENVECTORS TO THE SINGULAR VALUE DECOMPOSITION VIA PRINCIPAL COMPONENT ANALYSIS. (REQUIRED FOR III)**

**III: MATRIX FACTORIZATIONS AND TRANSFORMATIONS: THIS COURSE COVERS SPECTRAL METHODS INCLUDING LAPLACIAN EIGENMAPS AND MULTI-DIMENSIONAL SCALING, DISCRETE FOURIER AND WAVELET TRANSFORMS, ANGLES BETWEEN SUBSPACES AND THE GENERALIZED SINGULAR VALUE DECOMPOSITION. (REQUIRED FOR IV)**

**IV:Q!: BACKGROUND THEORY: THEORY SUPPORTING MODULES I-III AND ADDITIONAL TOPICS INCLUDING THE PSEUDO-INVERSE.**