MATH4031: Linear Algebra – Preliminary Syllabus

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Office Hours: Mondays: 4:30 - 6:30 pm, in Room 407H.

- **Textbook**: "Linear Algebra with Applications", by Steven J. Leon, Pearson Prentice Hall, New Jersey 07458, 7th Edition (2006) or after
- **Prerequisites:** Calculus, Algebra II
- **Expected Work:** Weekly written homework/quizes (= 1/10); two midterms and final (= 9/10).
- **Topics:**
  1. Matrices and Systems of Equations: Systems of Linear Equations; Row Echelon Form; Matrix Algebra; Elementary Matrices; Partitioned Matrices; Matlab Exercises*
  2. Determinants: The Determinant of Matrices; Properties; Cramer's Rule; Matlab Exercises*;
  3. Vector Spaces: Definitions and Examples; Subspaces; Linear Independences; Basis and Dimensions; Change of Basis; Row Space and Column Space; Matlab Exercises*
  4. Linear Transformations: Definitions and Examples; Matrix Representations of Linear Transformations; Similarity; Matlab Exercises*
  5. Orthogonality: The Scalar Product in R^n; Orthogonal Subspaces; Least Squares Problems; Inner Product Spaces; Orthogonal Sets; etc..
  6. Eigenvalues and Eigenvectors etc..
  7. (?) Numerical Linear Algebra
- **References:**
  1. "Linear Algebra", 4th Edition, by Stephen Fredberg, et al.
  2. "Numerical Methods Using MATLAB", J. Matthews and K. Fink, Prentice Hall, 1999
  3. "Scientific Computing, An Introductory Survey", 2nd Edition, M. T. Heath, McGraw-Hill, 2002

[NO RECITATION FIRST WEEK]