Course-level learning goals

The primary goals of this are as follows

I. Explore fundamental concepts of linear algebra from a mathematical perspective.

II. Prepare students to succeed in upper level courses that require this course as a pre-requisite.

Students are expected, at a minimum, to be able to do all problems from lecture and homework (and similar problems) on quizzes and exams. For more, see the portion of the webpage that discusses how to succeed in this course. Learning outcomes (or learning objectives) are statements that articulate what students are expected to do in a course. They are designed to help reach the course goals, and the outcomes for this course are as follows.

A) Construct, or give examples of, mathematical expressions that involve vectors, matrices, and linear systems of linear equations.

B) Evaluate mathematical expressions to compute quantities that deal with linear systems and eigenvalue problems.

C) Analyze mathematical statements and expressions (for example, to assess whether a particular statement is accurate, or to describe solutions of systems in terms of existence and uniqueness).

D) Write logical progressions of precise mathematical statements to justify and communicate your reasoning.

E) Apply linear algebra concepts to model, solve, and analyze real-world situations.

F) Identify course-related information, policies, and procedures that are contained in the syllabus and related course websites.

The course also has a more specific list of learning goals. By the end of this course, it is expected that students will be able to do the following.

- Methods for solving systems of linear equations, such as row reduction and matrix decompositions such as the LU and SVD decompositions.
- Geometry of linear transformations.
- Characterizations of invertible matrices and determinants.
- Eigenvalue and Eigenvectors, and their uses.
- The structure of a linear transformations, including decompositions, such as LU, spectral or singular value decompositions.
- Orthogonal projections and their application to determine best-fit solutions to over-determined systems of linear equations.

A tentative calendar of the topics can be found here.