This semester we will have at least one group project, which you will do in groups of three. The first (only?) will involve Matlab. Each group will do a different project. Your group will turn the project in, revise it if necessary, and then present it to the class. By Wednesday, February 12, each group should give me a list of the group members and a list of project preferences (with 1 for your group’s first choice, 2 for the second, 3 for the third).

Project 1: ATLAST §7.2 #1,10 (In 1 (h) you will want to be sure you have real eigenvalues. One way to guarantee this is to use symmetric matrices.)

Project 2: ATLAST §7.2 #8,10 (In 8, you must prove your conjectures. You may want to use the command `pause` to get Matlab to stop between plots.)

Project 3: ATLAST §7.2 #10,12-14 (In 14, you must prove your conjecture.)

This semester each of you will present a topic to the class. It must be a topic closely related to the rest of the course material. Here is a list of topics. By Wednesday, February 19, please give me a ranked list of your choices.

- The determinant of the Vandermonde matrix
- The minimax principle for finding eigenvalues of real symmetric linear transformations of \( \mathbb{R}^n \)
- Continuity of the eigenvalues, under appropriate hypotheses, of a family of matrices depending continuously on a parameter
- Fast matrix multiplication
- Stochastic matrices
- Applications of linear algebra to solving systems of ODEs
- Fibonacci numbers
- Affine transformations, including an interesting application
- Isometries and the orthogonal group
- Proof of the Fundamental Theorem of Algebra
- Quaternions
- Other (specify what it is)