Math S303: Honors Course in Linear Algebra  
Spring 2020  
MWF 10:10-11:00, SE 010

Professor Jim Davis  
Office: Rawles Hall 259  
Phone: 855-5069  
email: jfdavis@indiana.edu

Office hours: Monday 9-10, Tuesday 3:30-4:30, Thursday 1:30-2:30, and by appointment.

Associate Instructor: Jordyn Harriger email: joharrig@indiana.edu

Text: Axler, *Linear Algebra Done Right, 3rd Edition*

Grades: 
Exam I: 25% Friday, February 14  
Exam II: 25%  
Final: 35% Wednesday, May 6 at 5 pm.  
Homework: 15%

The above is subject to change; for example if I decide to give quizzes or an oral exam, they will be averaged in.

Homework: Students may ask others for help with their homework, and also work together whenever they choose to do so. The writing should be done independently.  
However, it is unwise to do the homework exclusively in a group. There seems to be no substitute for individual concentration and self reliance as a means for building insight and self confidence in mathematics.  
This course will emphasize writing coherent mathematics. You should use complete sentences and well-organized paragraphs.

A few comments on writing proofs:

- To set the level of your writing, aim at your peers. In other words, one of your fellow students should be able to follow every step without difficulty.
- Do not try and “fudge” things if you don’t know them. If you have a missing step, state that clearly.
- Typically one needs to prove an implication: if $a$ than $b$ (or $a \implies b$ or $a$ implies $b$). Here $a$ is the hypothesis and $b$ is the conclusion. One should then start the proof with $a$ and end with $b$.
- An implication ($a \implies b$) is equivalent to its contrapositive ($\sim b \implies \sim a$).
- Feel free to come to office hours and show me your proofs.

Post-spring break syllabus:  
Week of March 30: 5A (eigenvalues, eigenvectors, invariant subspaces), 5B (an endomorphism of a complex vector space has an upper triangular basis)
Week of April 6: 4 (polynomials and complex numbers - I may not follow the text closely), 5C (eigenspaces), exam on April 10.

Week of April 13: Determinants - chapter 10 and handout

Week of April 20: Inner Product Spaces - chapter 7

Week of April 27: The Spectral Theorem and/or the Cayley-Hamilton Theorem

Final Exam: Wednesday, May 6 at 5-7 pm.