

# MATH 423, Section 200/500

## Linear Algebra II

Spring 2012

**Instructor:** Yaroslav Vorobets

**Time:** MWF 12:40–1:30 p.m.

**Location:** BLOC 160

**Web page:** <http://www.math.tamu.edu/~yvorobet/MATH423/>

**Office:** Milner 004 (e-mail: [yvorobet@math.tamu.edu](mailto:yvorobet@math.tamu.edu))

**Office hours:** MWF 11:00 a.m.–12:00 p.m., and by appointment.

**Text:** Friedberg, Insel & Spence, *Linear Algebra*, 4th ed., Pearson Education, Upper Saddle River, NJ, 2003 (<http://www.pearsonhighered.com/product?isbn=9780130084514>).

**Prerequisite:** MATH 323 or MATH 304 (linear algebra).

**Course content:** see the next page.

**Grading system:** There will be 2 in-class tests and the final comprehensive exam. The tests are worth 90 points (or 22.5% of the final grade) each, the final exam is worth 100 points (or 25% of the final grade). Extra credit can be earned by solving bonus problems. Also, there will be homework assignments and quizzes, which will account for another 120 points (or 30% of the final grade). The final grades will be assigned according to the 90–80–70–60% scale, that is, A for 360+ pts, B for 320–359 pts, C for 280–319 pts, D for 240–279 pts, and F for less than 240 pts.

The *tentative* dates for the two tests are February 15 and March 23. The final exam is scheduled for Monday, May 7, 3:30–5:30 p.m.

I will assign and collect homework about once per week. Late homework will be accepted only for legitimate reasons and may be penalized if circumstances warrant.

**Make-ups:** Make-ups for missed tests will only be allowed for a university approved excuse in writing. Wherever possible, inform the instructor before a test is missed. Consistent with University Student Rules, students are required to notify the instructor by the end of the next working day after missing a test. Otherwise, they forfeit their rights to a make-up.

**Academic integrity:** Although students are encouraged to discuss homework problems, each student is expected to write his/her own solutions. Copying another student's work is dishonest and academically worthless. Information about the Honor Council Rules and Procedures can be found at <http://aggiehonor.tamu.edu/>

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**Course content:** This is the second course in linear algebra covering the abstract concepts of vector space and linear transformation as well as some models and applications of these concepts. The main topics to be covered are: vector spaces, linear transformations, eigenvalues and eigenvectors, diagonalization, Jordan canonical form, inner product spaces, self-adjoint operators, spectral theorem.

Many topics should be familiar from the first course in linear algebra. However they will be treated more extensively. Moreover, the emphasis of the course is on rigorous proofs and advanced applications. All kinds of assignments might include theoretical problems (to prove something rather than to compute something).

### Course outline

- Vector spaces ( $\approx 2$  weeks)

*Friedberg/Insel/Spence:* Chapter 1

- Linear transformations ( $\approx 2$  weeks)

*Friedberg/Insel/Spence:* Chapter 2

- Systems of linear equations, matrix algebra, determinants ( $\approx 2$  weeks)

*Friedberg/Insel/Spence:* Chapters 3–4

- Eigenvalues and eigenvectors, diagonalization ( $\approx 2.5$  weeks)

*Friedberg/Insel/Spence:* Chapter 5

- Inner product spaces, special classes of operators ( $\approx 3.5$  weeks)

*Friedberg/Insel/Spence:* Chapter 6

- Jordan canonical form ( $\approx 1.5$  weeks)

*Friedberg/Insel/Spence:* Chapter 7