

**Math 312: Linear Algebra**  
**Fall 2012**  
**Monday, Wednesday, Friday 10am–11am, DRL A6**

**Instructor:** Dr. Jeff Jauregui (JARE-uh-ghee)

**Office:** DRL 4E3

**Office hours:** Wednesdays and Thursdays, 3–4pm, and by appointment

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**Teaching assistant:** Neel Shah

**Office:** DRL 3W3

**Office hour:** Monday 11am – 12pm

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**Text:** *Linear Algebra with Applications*, Otto Bretscher, 4th edition

**Course web pages:** <http://www.math.upenn.edu/~jjau/math312> and **Blackboard**

**Course description:** A prerequisite for this course is Math 240. Some of the topics we will cover (not necessarily in order) are:

- systems of linear equations, existence and uniqueness, Gauss–Jordan elimination
- linear transformations and their geometry
- vector spaces and subspaces
- determinants and geometry
- dynamical systems, Markov chains
- eigenvectors and eigenvalues, diagonalization, complex eigenvalues
- Google’s PageRank algorithm
- orthonormal sets, Gram–Schmidt process, orthogonal projection
- least-squares solutions
- inner product spaces and Fourier series
- singular value decomposition (SVD), with applications to image compression and principal component analysis (PCA)
- additional applications, possibly including facial recognition, wavelets, finance

**Attendance and notes:** To be successful in this course, you should be present for all class meetings and plan to take good notes. We may have occasional quizzes in class.

**Homework, quizzes, reading:** Homework problems will be assigned regularly (via Blackboard), collected, and graded for completeness and correctness. Carefully doing and making sure you understand the homework problems is absolutely essential for your success! Quizzes will be announced in advance and will be based on the homework problems of that week. No make-up quizzes will be given for any reason. However, your lowest two grades from the homework and quiz category will be dropped.

You may certainly work with others on your homework assignments, but any work you turn in must be your own. Copying will not be tolerated.

You are expected to carefully read each section of the textbook, bringing your questions to class and office hours.

**Exams:** There will be two midterm exams and one final exam, according to the following schedule. **Notify me immediately** if you have a conflict with any of these dates.

- Midterm 1: Wednesday, October 10th, in class
- Midterm 2: Wednesday, November 14th, in class
- Final exam: Thursday, December 13th, 9am – 11am, location TBA

All exams are to be taken under the University's Code of Academic Integrity (see below).

**Missed/late work:** Late homework will not be accepted. Missed exams will count as zero, except for reasons such as serious illness, family emergency, etc. (in which case written notification from a dean is required). I may excuse other absences if notified far in advance. In these cases, your grade will be based on your performance on the final exam.

**Grades:** Your grade for the course will be determined from the following factors:

Homework and quizzes	15 %
Midterm exams	25 % each
Final exam	35 %

I will not allow changes to your score on a homework, quiz or exam more than two weeks past the due date.

**Office hours:** I will hold regular office hours at the times noted on the first page, unless I email or tell you otherwise in class. Alternatively, you may set up an appointment to meet with me. *You are also welcome to attend the office hours of the instructor of the other section, Professor Kazdan;* please see <http://www.math.upenn.edu/~kazdan/312F12>.

**Students with disabilities:** Any student requiring special accommodations is encouraged to contact the instructor and the Office of Student Disabilities Services as soon as possible.

**Honor code:** You are not allowed any outside help (people, books, notes, calculators, phones, etc.) during exams or quizzes, unless specifically authorized. Academic integrity is taken very seriously, and Penn's Code of Academic Integrity will be strictly enforced. Cheating on quizzes or exams (using unauthorized notes, copying/sharing work with other students, etc.) or copying a homework assignment will result in a score of 0 on that work and referral to the Office of Student Conduct.

**Getting help:** This course will be fast-paced, so it is very important to get help right away as needed. First and foremost, *you should ask questions in class and attend office hours.* Here are some other ways to get help:

- Weingarten Learning Resource Center (<http://www.vpul.upenn.edu/lrc/>)
- The Tutoring Center (<http://www.vpul.upenn.edu/tutoring/>)
- private tutors (<http://www.math.upenn.edu/ugrad/tutors.html>)