Linear Algebra - MA 242 SB1
Summer 2011

Instructor: Timothy Kohl
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Office Hours: TBA
Lecture: PHO 201 - M-Th 1:00 PM - 3:00 PM


Remarks: The main prerequisite for this course is a basic familiarity with mathematics at the level you would have after completing the beginning semesters of Calculus. The course material begins with a seemingly simple question: If one has 'm' equations in 'n' variables, e.g.

\[ \begin{align*}
3x + 2y - z &= 6 \\
2x - 6y + 3z &= 2 \\
\end{align*} \]

one asks if there are solutions, and if so, what is the nature of these solutions? We shall develop a number of theoretical and computational tools in order to answer both questions. The adjective 'linear' refers to the fact that the variables appear only to the first degree, e.g. no \( x^2 \) terms. It also is used when characterizing what is known as a 'vector space' which is the fundamental idea that underlies all of this material. We shall also explore the connections these ideas have with geometry as well. The applications of linear algebra are myriad, not only in other areas of pure and applied mathematics but also in the sciences, as well as disciplines such as economics.

Outline of topics to be covered: (Note: Not all sections in a given chapter are covered.)

- Linear Equations in Linear Algebra - Chapter 1
- Matrix Algebra - Chapter 2
- Determinants - Chapter 3
- Vector Spaces - Chapter 4
- Eigenvalues and Eigenvectors - Chapter 5
- Orthogonality and Least Squares - Chapter 6 (time permitting)

Exams: During the semester, there will be two exams worth 100 points each, as well as a final exam worth 200 points. The schedule for these exams is given on the next page.
**Homework:** During the semester, I will generally assign homework on a daily basis. This homework is your primary means of learning the material, even more so than the lectures. Indeed, it is only by actually working out the solutions to problems that one really learns this material. Not doing homework is a bad idea and will result in a poor performance in the course.

Additionally, there will be, throughout the course of the semester, 5 turn-in homework assignments, each worth 20 points, for a total possible maximum of 100 points if you complete each perfectly. Each turn-in assignment will be due by the next class meeting after it was assigned.

**Grading:** Your grade in the course will be based on the combined sum of the two exams, the 5 turn-ins, and the final exam, out of a possible total of 500 points.

**Makeup Exams:** Except in cases of illness, and then, only with a signed doctor’s note, exams will be given only at scheduled times.

**Cheating:** I consider cheating and plagiarism to be very serious offenses and any cases of it will merit action by the University Academic Standards Committee.

**Important Dates:**

Substitute Monday on **Friday** July 8th (because of the Monday holiday)

Exam 1 – Thursday July 14
Exam 2 – Thursday July 28
Final – Thursday August 11

The last lecture will be Wednesday August 10th.

**Web Page:** There is a web page for the course where you can find the homework assignments listed, as well as the syllabus and other materials that will be made available during the course.

The URL is:

[http://math.bu.edu/people/tkohl/teaching/current](http://math.bu.edu/people/tkohl/teaching/current)