MATH 231 Section 1
Linear Algebra
Spring 2007

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Course Web Page: http://www.fredonia.edu/faculty/math/JonathanCox/linalg/
Text Web Page: http://www.laylinalgebra.com/

*While these are the official office hours, I am available at other times as well. If you want to meet at a
time outside of office hours, the best option is to set up an appointment with me. You can also just drop
by any time, but you may want to call first to see if I'm there.


A TI graphing calculator is strongly recommended. The particular model (83, 84, 86, or 89) is not
important, although a TI-89 may be somewhat advantageous. Calculators may not be allowed on certain
assessments, and, when they are, you will still be required to show work.

Prerequisite. MATH 121 or 123 (Calculus I). MATH 210 (Discrete Mathematics) recommended.

Catalog Description. Thorough treatment of linear algebraic systems. Matrix algebra; determinants;
vector spaces; linear independence; basis and dimension; inner product spaces; least squares
approximation; eigenvalues and eigenvectors; diagonalization. Selected applications to physics,
economics, geometry, statistics, and differential equations.

Course objectives. The purposes of this course for the student include (1) Developing an
understanding of the fundamental definitions and concepts of linear algebra, (2) Developing
computational skills in linear algebra, (3) Improving reasoning, critical thinking, and problem-solving
skills, (4) Sampling some of the many application areas of linear algebra, (5) Acquiring an appreciation of
the concepts that form the foundation of twenty-first century science and technology, and (6) Learning to
communicate mathematical ideas, arguments, and results. In particular, the course will gradually
encourage development of proof-writing ability.

For more details, see the objectives (expected results of the course) included in the master syllabus for
MATH 231 at http://www.fredonia.edu/department/math/MasterSyl/MATH/math231_master.html. In
addition to the objectives listed there, students completing this course should also be able to understand
and work with the concepts of linear transformation, dimension, rank, diagonalization, and inner product.

Content and Methodology. The course will cover the material in the first six chapters of the text
with selected omissions (mainly of certain applications). Typically, we will cover a section of the text in
one to two meetings. The beginning of each class period will be reserved for discussion of the homework
and other questions. Up to 1/3 of the period may be used for this purpose. Most of the remaining time
will be used for presentation of new material. Usually the instructor will lecture, although there might be
other activities such as group work and board work. Students are encouraged to ask questions and make
relevant comments at any time.
Homework and quizzes. Homework will be assigned from each section. Do the homework! How well you do in the class is directly related to how much homework you do. If you don’t do the homework, you probably won’t pass. It is also to your advantage to ask questions about homework problems that give you difficulty. Finally, read the sections in the textbook! You are beginning the transition to true mathematics, which is based on concepts rather than computations. You will not be able to adequately grasp the concepts simply by doing computational exercises.

Your completion and understanding of the homework will be assessed regularly. Sometimes I will specify one or more exercises for you to turn in. At other times there will be quizzes on the homework during class. Quizzes will usually be announced, but might occasionally be unannounced, and you will typically have between 5 and 15 minutes to complete each one depending on the type and length. QUIZZES MAY NOT BE MADE UP. (If you expect to have an excused absence, see me about taking the quiz early.) Missed quizzes will result in a grade of zero. In order to compensate for the occasional missed quiz, each student will receive 20 free quiz points. These will be added to the point totals incrementally during the semester.

Some projects and other special assignments will probably be collected and graded. Due dates for all assignments will be specified, and no late work will receive full credit, except in the case of an excused absence on the due date. (See the Attendance Policy section below.) I define work to be late if it is handed in after the beginning of the class period following the due date. Late work can still be handed in and graded, but will receive credit for only 50% of the points earned. No late work may be handed in after the last day of class or more than one month after the original due date.

Comments will always be provided on collected work, but some homework assignments and quizzes will be graded on completion rather than correctness. Other homework assignments and quizzes will be graded in detail based on correctness. The method of grading for each homework assignment and quiz will be determined randomly. The probability of a homework assignment being graded for correctness is 1/6, and the probability of the same for a quiz is 1/2.

Exams. The purpose of the exams is to determine your level of mastery of the concepts of the course. They will test not only your ability to memorize, but also your ability to think. There will be three 50 minute in-class exams and a 120 minute comprehensive final examination. The tentative dates of the in-class examinations are February 16, March 9, and April 16. The final exam will be given on Friday, May 11, at 8:30am.

Normal make-up exams will be given only in serious and unavoidable circumstances, or in the event of an excused absence, and only if your request to make up an exam is approved by the instructor in advance or as soon as reasonably possible. Make-up exams must be taken within two class periods following the day of the exam. If these conditions are not satisfied, it is understood that the opportunity to make up the examination at that time is voided. In this case, exams may still be made up during the special make-up exam period during finals week. The special make-up exam period is 11:00am-12:00pm on Wednesday, May 9.

Grading and Evaluation. Performance in this course will be evaluated based on the percentage of points earned relative to total number of points possible. Each of the three 50-minute exams is worth 100 points, the final exam is worth 150 points, homework, quizzes, and other assignments will probably contribute around 250 points. Thus the final grades will be based on approximately 700 points. To obtain your percentage at any time during the course, divide the total number of points you have earned by the total number of points available at that time and multiply by 100. I will also update these totals regularly and make them available on ANGEL.
Letter grades will be assigned as follows based on a student’s final percentage:


The instructor reserves the right to lower the grade ranges. The grade ranges will not be raised.

**Attendance Policy.** Our policy is based on the SUNY Fredonia attendance policy principles. (See pp. 195-196 and p. 215 of the current undergraduate catalog.) Attendance is not officially a part of the grade. However, you probably won’t be able to pass the course if you do not attend regularly. Learning linear algebra is a cumulative experience. If you miss class even once, you may have difficulty catching up. If you must be absent, please notify the instructor ahead of time. An attendance sheet will be passed around each time the class meets. **It is your responsibility to sign this sheet** each period in order for your attendance to be official.

Work missed during an absence can be made up if the absence is determined by the instructor to be an excused absence. Your absence will be excused if you are participating in a university-sponsored program, exercising religious beliefs, hospitalized, or attending the funeral of a relative. Other absences due to unavoidable circumstances may also be excused at the discretion of the instructor. Appropriate documentation for an excused absence must be provided to the instructor within three days of returning to classes.

**Special Accommodations.** “It is the responsibility of students with disabilities to identify themselves by notifying the Coordinator of Disability Support Services for Students.... For specific information about services and facilities for students with disabilities, students should contact ... Disability Support Services for Students, Reed Library (fourth floor), by telephone at (716) 673-3270, by TTY at (716) 673-4763, or by email at disability.services@fredonia.edu” (p. 194, SUNY Fredonia Catalog). See also www.fredonia.edu/tlc/DSS/dss.htm.

**Withdrawal Policy.** The drop and withdrawal policy for this course will be that of the University. (See p. 195 and p. 200 of the SUNY Fredonia Catalog.) **IT IS YOUR RESPONSIBILITY TO KNOW AND COMPLY WITH ALL DEADLINES.** The last day to DROP this course is **Friday, January 26.** The last day to WITHDRAW from this course is **Friday, April 6.** The last day to completely withdraw from the university is **Monday, April 23.**

**Academic Dishonesty/Misconduct.** The University has explicit rules governing academic dishonesty and academic misconduct. The policies are detailed in the Academic Integrity Policy (SUNY Fredonia Catalog, pp. 212–215). The university policies will be followed in this class. The minimum penalty for an act of academic dishonesty will be the assignment of a grade of zero on the examination, quiz, or homework assignment.

You are encouraged to work together on homework and in learning the material. While working with another person or in study groups is permitted, **all written work submitted must be your own.** Copying someone else’s problem solution or showing your written solution to someone else is prohibited. **In order to be successful in learning the material and preparing for the examinations, you need to try to work out the homework problems yourself as much as possible before discussing them with anyone else.**

**Daily schedule.** A tentative daily schedule for this course is available online at http://www.fredonia.edu/faculty/math/JonathanCox/linalg/schs07.pdf.

Any changes to this syllabus will be communicated in class by the instructor.