MATH 245 — Linear Algebra

Fall, 2004

Instructor: Dr. Lester Caudill lcaudill@richmond.edu
205 Jepson Hall http://www.mathcs.richmond.edu/~caudill
289-8083

Office Hours: TU 10:30-11:30am, TU 2:00-3:00pm, WED 11:30am-12:30pm, FRI 11:30am-12:30pm, and by appointment.


Course Description: Linear algebra is quite possibly the most important mathematics course you will ever take. The concepts in this course reappear in important ways in many higher-level mathematics and computer science courses, and are instrumental in the sciences as well. The central player in linear algebra is the system of linear equations. Amazingly, this single concept leads to an entire abstract mathematical theory.

This course is fundamentally different from an introductory calculus course. In linear algebra, the concepts are just as important as the calculations. While there will be some calculations for you to do, you will also be expected to think about things in a more abstract and sophisticated way than you were asked to do in previous mathematics courses. This will help you develop a more analytical way of thinking, a tool that will be sure to help you, no matter what your career choice.

This course is intended to challenge you, and help you to reach a higher level of understanding and develop a more sophisticated approach to analytical thinking. If at any time during the semester you feel you are not being challenged, just let me know, and I will be happy to turn it up a notch.

Course Objectives: Upon successful completion of the course you will be able to . . .

• ...communicate intelligently in the language of linear algebra, confidently using terms like vector space, linear transformation, etc.

• ...analyze a system of linear equations using a variety of methods, while making an informed judgement on which method to use for a particular situation.

• ...recognize non-math situations in which a system of linear equations would be an appropriate mathematical model, and be equipped to develop and analyze this model. (This is where understanding the concepts is crucial.)

• ...independently read other linear algebra books and journal articles, to permit you to take advantage of the wealth of linear algebra tools and concepts that we will not be able to cover this semester.

Homework: Homework will be collected daily and graded periodically. Students are allowed to consult with one another provided everyone does their share.

Mini-Projects: The course will include a number of extended, out-of-class assignments.

Computer Assignments: A number of assignments will involve the use of the computer software package Mathematica. Mathematica will also prove useful on a number of homework exercises from the text. No special knowledge of computers is necessary for the course. A web-based Mathematica tutorial is available on our course webpage.
**Exams:** There will be three in-class exams and a (comprehensive) final exam. The exams are scheduled to be administered on the following dates:

- Exam 1: Wednesday, September 22
- Exam 2: Wednesday, October 27
- Exam 3: Monday, November 22
- Final Exam: Tuesday, December 14, 7pm-10pm.

**Grading Policy:**

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<tr>
<th>Component</th>
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<tbody>
<tr>
<td>Exam 1</td>
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<tr>
<td>Homework</td>
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<td>Exam 2</td>
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<td>Computer Assignments</td>
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<td>Exam 3</td>
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<td>Mini-Projects</td>
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<td>Final Exam</td>
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**Attendance:** Students are expected to attend all class meetings. If an absence is unavoidable, you are still responsible for all material covered and assignments made. **THERE ARE NO MAKE-UP EXAMS.** If an exam is missed, and the excuse is offered within 24 hours, and the excuse is allowed, then the grade on the Final Exam will replace the exam grade. A student who must miss an exam because of a University-sponsored activity should notify me as soon as possible, as you may be able to arrange to take the exam early.

**E-mail:** From time to time, I will email you with course-related information. You are responsible for monitoring your university email account periodically every day, and I will assume you are doing so.

**Academic Honesty:** Students are to abide by the official University policy on academic honesty. Each student will be required to sign their exam papers, thereby signifying their compliance with the University Honor Pledge.