

MATH 461 — SECTION 0601 — FALL 2002

Linear Algebra for Scientists and Engineers

MTH 0403 TuTh 12:30-1:45

Instructor

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Office Hours: Mo 2-3, Th 10-11 (or by appointment)

WEB page with information of the course

www.math.umd.edu/~rhn/

Textbook

Gilbert Strang, *Introduction to Linear Algebra*, second edition, Wellesley-Cambridge Press, 1998; ISBN 0-9614088-5-5.

Syllabus

1. Introduction to Vectors (Chapter 1)
2. Solving Linear Equations (Chapter 2)
3. Vector Spaces and Subspaces (Chapter 3)
4. Orthogonality (Chapter 4)
5. Determinants (Chapter 5)
6. Eigenvalues and Eigenvectors (Chapter 6)

7. Linear Transformations (Some topics from Chapter 7)
8. Applications (Some topics from Chapter 8)
9. Numerical Linear Algebra (Some topics from Chapter 9)
10. Complex Vectors and Matrices (Some topics from Chapter 10)

Grading Policy

EXAM 1 (25%): \cong October 17, Chapters 1 through 3.

EXAM 2 (25%): \cong December 3, Chapters 4 through 6.

FINAL (30%): Friday Dec 20, 1:30-3:30, covering all the material of the course.

QUIZZES (10%): There will be a 10-minute quiz every two weeks, unless stated otherwise, which will cover the material developed since the previous quiz. Quizzes will be announced the class before.

MATLAB (10%): There will be several MATLAB assignments. Students are encouraged to work in groups of up to three students but must hand in an individual project report.

HOMEWORK (0%): Homework problems will be assigned each class but not graded. Quizzes will be slight modifications of homework problems. There is a list of the homework assignments on the webpage of the course, which will be updated frequently.

Make-up Policy

Make-up examinations will be given *only* in the case of an absence caused by illness, religious observance, participation in a University activity at the request of the University authorities, or compelling circumstances beyond the students' control. Convincing documentation such as a doctor's note will be required. If possible, an absence should be arranged before the exam.

MATLAB

We will be using the software package MATLAB, a computer system for doing linear algebra calculations. We will use MATLAB in two ways: 1) to illustrate the basic linear algebra theory we will be developing; 2) to carry out certain important linear algebra calculations that cannot be done by hand (usual pencil-and-paper calculations). These two uses will be carefully explained in the course, but it may be useful to explain them briefly here. The solution of linear equations and the calculation of eigenvalues and eigenvectors, are two linear algebra problems of special importance in applications, but because of the sizes of the matrices involved, they must be done on a computer; hence the importance of the second use. It is only for very small matrices or matrices of special type that these two problems, as well as many other problems, can be solved by hand. It is thus difficult to illustrate the theory of linear algebra on any but the simplest matrices by hand calculation; hence the importance of the first use.

MATLAB Information

You can access MATLAB in a WAM Lab, in a GLUE Lab, or on your own PC, if you have the Student Version or Student Edition of MATLAB. In the WAM and GLUE Labs, MATLAB is on Sun and DEC Workstations, and PCs. The Student Edition is marketed by Prentice Hall, and is available in bookstores. The Student Version is available in bookstores and on the MathWorks web site (<http://www.mathworks.com>).

The Teaching Codes. Accompanying our text is a collection on Teaching Codes, which we will use. These codes, which are M-files, can be found in the text web page: <http://web.mit.edu/18.06/www>

The web page has instructions for downloading these codes. The codes can be accessed provided MATLAB is invoked in the directory containing the codes.

The MATH Department offers tutoring on MATLAB. For information check

www.math.umd.edu/undergrad/246241Tutorf01.htm

For further information on Campus computing facilities, you are referred to the AITS Consulting Lab, Room 1400 in the new wing of the Computer and Space Science Building, Phone: (301) 405-51500.