

TUFTS UNIVERSITY
Department of Mathematics

Math 70-02

Linear Algebra

Fall 2016

Instructor: Mary Glaser (mary.glaser@tufts.edu)
Block: D (Mon 9:30-10:20am, Tue, Thu 10:30 - 11:20am)

Prerequisites: Math 34 (or 39) or instructor's consent.

Required text: *Linear Algebra and Its Applications*, 4th edition, by David Lay, Addison-Wesley (Pearson), 2011. You can also buy the textbook packaged with a copy of the *Study Guide for Linear Algebra and Its Applications*. The *Study Guide* is recommended, but not required.

Course Website: <http://courses.math.tufts.edu/math70/>

Description: Linear algebra is the study of matrices, vector spaces, and linear transformations. In Math 70 we start by studying systems of linear equations. This will quickly lead to useful concepts such as vector spaces, dimension (you will learn about four-, five-, and infinite-dimensional spaces), linear transformations, and eigenvalues. These concepts will help you solve linear equations efficiently, and more importantly, they fit together in a beautiful framework that will give you a deeper understanding of mathematics. Linear algebra arises everywhere in mathematics (you will use it in almost every one of our upper level courses) as well as in physics, chemistry, economics, biology, and a range of other fields. Even when a problem involves nonlinear equations, as is often the case in applications, linear systems still play a central role, since the most common methods for studying nonlinear systems approximate them by linear systems.

Among the applications of linear algebra are solutions of linear systems of equations, determining conic curves and quadric surfaces not in standard form, the second-derivative test in vector calculus, computer graphics, linear economic models, and differential equations. Linear algebra also enters in further study of calculus, where the derivative is viewed as a linear transformation.

In addition to computation and problem-solving, axiomatic mathematics and basic proofs are important parts of the course.

Homework: Homework problems will be assigned and picked up starting with the first assignment. Homework is due the class day after it is assigned. You are encouraged to collaborate with other students on the homework and to check your solutions for mistakes. However, you must submit your own answers showing all of your work. Each problem will count 1 or 2 points.

Exams: Please read the departmental exam policy here: <http://math.tufts.edu/courses/examPolicy.htm>. Take special note of the policy on missed exams. We do not give make-up exams for the midterms and an unexcused absence from any exam will be counted as a zero. Excused absences are determined by the Mathematics Department on a case by case basis. Midterm exams are given in the "open" block on Mondays from 12-1:20 pm in rooms to be announced. Exams are *not* given in your classroom. The exam room schedule will be posted in the Math building as well as on the Math Department website under the menu item Courses : <http://math.tufts.edu/courses/>

Exam 1: Monday, October 17, 12:00 - 1:20 pm

Exam 2: Monday, November 14, 12:00 - 1:20 pm

Final Exam: Friday, December 16, 8:30 - 10:30 am

Quizzes: There will several in-class quizzes which will be announced one week in advance. They will involve definitions or problems similar to those from the homework.

Grading: Suppose H is your homework score, Q is your total quiz score scaled to 100, M is your higher midterm score, m is your lower midterm score, and F is your score on the final exam. Your course score S is the larger of the following two quantities:

$$S_1 = .05H + .05Q + .15m + .30M + .45F$$

$$S_2 = .05H + .05Q + .20m + .30M + .40F$$

If you miss a midterm exam for a reason *accepted as legitimate by the Mathematics Department*, your course score S would be the larger of these two numbers:

$$S_1 = .05H + .05Q + .40M + .50F$$

$$S_2 = .05H + .05Q + .35M + .55F$$

Identifiers: Because homework is collected and returned in class and spends some time in various mailboxes, you have the right to use a "unique identifier" instead of your name in order to protect your privacy. Your educational record is privileged information under the federal Family Educational Rights and Privacy Act (FERPA), and using your name as identifier means that you opt out of this legally guaranteed confidentiality with respect to homework scores.

Learning Objectives: This course satisfies Learning Objectives 1a, 1c, 1d, and 2a, 2b.
(See <http://ase.tufts.edu/faculty/committees/objectives/math.htm>)

Student Accessibility Services: If you are requesting an accommodation due to a documented disability, you must register with the Student Accessibility Services Office at the *beginning of the semester*. Do not wait until the exam is about to be given. To do so, call the Student Services Desk at 617-627-2000 to arrange an appointment with Kirsten Behling, Director of Student Accessibility Services. In case of financial hardship, the fees for disability testing may be waived.