

Topics in Applied Mathematics I

(LINEAR ALGEBRA AND VECTOR CALCULUS)

Course description: Matrices and systems of linear equations, determinants, vector spaces, linear transformations, orthogonality and inner product spaces, eigenvalues, eigenvectors and diagonalization, vector analysis including gradient, divergence, curl, line and surface integrals, and Gauss, Green, and Stokes theorems.

Objectives: Detailed learning objectives for each week are stated on the course Web page. The general philosophy of the course is explained at some length at <http://calclab.math.tamu.edu/~fulling/m311/311objectives.pdf>.

Prerequisites: multivariable calculus (M. 251 or equivalent); differential equations (M. 308 or equivalent) at least concurrently.

Classes: MWF 8:00–8:50, Blocker 117

Web page: <http://calclab.math.tamu.edu/~fulling/m311/f12/>

Instructor: S. A. Fulling
Blocker 620H
fulling@math.tamu.edu

If I am not in my office, you can leave a note in my mailbox (in Blocker 603) or in the plastic pouch beside my office door.

Tentative office hours: M 3:00–3:50, T 3:00–3:50, W 1:50–2:40. Permanent office hours will be announced later.

Required textbooks:

- S. J. Leon and S. J. Colley, *Pearson Custom Mathematics: Topics in Applied Math I: Math 311, Texas A&M University* (Pearson Learning Solutions, 2013).
- S. A. Fulling, Math 311 lecture notes (published as *Linearity*, World Scientific, 2000), <https://www.math.tamu.edu/~fulling/linearity/>

Recommended book:

- M. R. Spiegel, *Vector Analysis* (Schaum's Outline Series).

Grading system:	Hour tests:	100 × 3 = 300
	Final exam:	200
	Homework and class participation:	<u>200</u>
	Total	<u>700</u>

The “curve” will be at least as generous as the “standard” scale [i.e., 90% (= 630 pts) will guarantee an **A**, etc.].

Dates of hour tests: Friday, Sept. 28, Wednesday, Oct. 24, Monday, Nov. 26

Final Exam: Friday, Dec. 7, 10–12 a.m.

Homework will usually be collected on Wednesdays. Assignments will be on the Web page.

Class participation: We will sometimes discuss homework problems and other examples at the blackboard (or projector) in class. Sometimes I'll assign problems for you to work

on in class in groups. At other times volunteers and random draftees will simply be called on. (You may also be called to the board to help me introduce a new concept or technique “Socratically”. In such cases a good participation score is attained merely by being alert and cooperative.) Attendance records may influence class participation scores slightly.

Make-up tests: Make-up tests are very hard to grade fairly, and they absorb a large amount of my time which would be better spent for the benefit of the whole class. Please cooperate in making these incidents as rare as possible. If you miss (or foresee that you will miss) a test, it is *your* responsibility to contact me as soon as possible to request, justify, and schedule a make-up test. (If you can’t reach me directly, you can leave a message at the Math Department office, (979) 845–3261.) If the absence is not clearly excused under the Attendance section of *Student Rules*, the request may be denied.

An Aggie does not lie, cheat, or steal or tolerate those who do. See Honor Council Rules and Procedures, <http://www.tamu.edu/aggiehonor> .

Plagiarism: Finding information in books or on the Internet is praiseworthy; *lying* (even by silence) about where it came from is academic dishonesty. Whenever you copy from, or “find the answer” in, some other source, *give a footnote or reference*. Otherwise, you are certifying that it is your own work.

Joint work: On a homework assignment (*not* a take-home test!) discussion with other students is permitted, even encouraged. However, the grader will not give homework credit for “work” that is parasitical (and your test scores will suffer, too!). To forestall problems, please follow these policies: (1) When two or more students work together on an assignment, they should all indicate so on their papers. (2) If the cooperation is of the divide-and-conquer variety, you are certifying that you *have studied and understand* every problem solution on your paper. Mindless copying is dishonest and academically worthless.

Calculators in exams: Calculators are to be used only to perform *elementary operations* such as addition, multiplication, and (optionally — see remark below) evaluation of simple functions such as square roots, sines, and logarithms. Advanced facilities such as storing formulas in memory, inverting matrices, and graphing functions on the calculator display are prohibited. Violations of this rule may lead to total prohibition of calculators in exams (probably at the insistence of other students).

Copyright: Course materials (on paper or the Web) should be assumed to be copyrighted by the instructor who wrote them or by the University.

Disabilities: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Disability Services Office in Cain Hall, Room B118, or call 845-1637. See also <http://disability.tamu.edu> .