

## Course Syllabus



Course MATH 2418-001 Linear Algebra  
Professor Dr. Paul Stanford  
Term Spring 2009  
Meetings MWF 2:30p.m. to 3:20p.m. in SOM2.904

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### Professor's Contact Information

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### General Course Information

Course Prerequisites MATH 2419 (Calculus), or consent of instructor  
Corequisites MATH 2018-301 T 8:30am or MATH 2018-303 R 11:30am  
Other Restrictions Graphing calculators will *not* be allowed;  
only non-alpha display calculators are permitted.

### Course Description

The main goal of the course is the presentation of some fundamental techniques of linear algebra. The concepts of vector spaces, matrices, determinants, inverses, eigenvalues and eigenvectors will be developed.

Chapter 1: Systems of Linear Equations and Matrices (1.1, 1.2, 1.3, 1.4, 1.5, 1.6 and 1.7)

Chapter 2: Determinants (2.1, 2.2, 2.3, and 2.4).

Chapter 3: Vectors in 2-Space and 3-Space (3.1, 3.2, 3.3, and 3.5).

Chapter 4: Euclidean Vector Spaces (4.1, 4.2, 4.3, and 4.4).  
Chapter 5: General Vector Spaces (5.1, 5.2, 5.3, 5.4, 5.5, and 5.6).  
Chapter 6: Inner Product Spaces (6.1, 6.2, 6.3, 6.4, 6.5, and 6.6).  
Chapter 7: Eigenvalues and Eigenvectors (7.1, 7.2, and 7.3).  
Chapter 9: Quadratic Forms (9.5).  
Chapter 8: Linear Transformations (8.1, 8.2, 8.3, 8.4, 8.5, and 8.6) as time permits.

## **Student Learning Outcomes**

Students will learn concepts and techniques of linear algebra, including vector spaces, matrices, determinant, transformations, eigenvalues and eigenvectors.

## **Student Learning Objectives**

1. Given a system of linear equations, students will be able to apply the Gauss-Jordan algorithm to determine all solutions, and determine whether the system is consistent and whether the solution is unique.
2. Given definitions of a set of objects with a well-defined addition and scalar multiplication, students will be able to evaluate whether this constitutes a Real vector Space. If valid, students will be able to demonstrate each axiom; if invalid, students will be able to present and verify an explicit counterexample to a vector space property.
3. Given a square matrix, students will be able to accurately calculate its determinant, and deduce whether the matrix is invertible or singular.
4. Given an explicit matrix, students will be able to determine its eigenvalues, and for each such eigenvalue students will be able to create a basis for the corresponding eigenspace.
5. Given a matrix, students will be able to accurately determine basis vectors for its row space, column space and nullspace.
6. Students will be able to calculate the least squares approximation to an over-constrained system of linear equations.

## Required Textbooks and Materials

Elementary Linear Algebra, Ninth edition, by Howard Anton

## Suggested Course Materials

Solutions Manual

## Academic Calendar

Classes begin	Monday January 12th
Last Day to Add a Course	Tuesday January 20th
Martin Luther King Day	Monday January 19th
Census Day	Wednesday January 28th
Last day to drop without a “W”	Wednesday January 28th
Signature Required period begins	Thursday January 29th
WP/WF withdrawal period begins	Monday February 9th
Midterm grades available online	Friday March 6th
WP/WF withdrawal period ends	Monday March 16th
Spring Break	Monday March 16th
	to Saturday March 21st
Last day of classes	Monday May 4th
Reading Days	Tuesday May 5th
	to Wednesday May 6th
Final grades available online	Thursday May 7th
	to Wednesday May 20th
Exam I	Monday February 16th
Exam II	Monday April 6th
Final Exam	Monday May 11th
	2:00p.m. – 4:45p.m.

## Grading Policy

Each quiz is worth 25 points. The lowest two quiz scores will be dropped. The remaining quizzes are counted and converted to a percentage, giving a possible total of 100 points. Each regular examination is also worth 100 points. The comprehensive final examination is worth 200 points. This score cannot be dropped.

These scores are weighted so that the final contributes 40% toward the overall grade. The remaining 60% is made up from the two exams and the quiz average (after dropping the two lowest quizzes). For these, the highest score has a weight of 30%, the next highest has a weight of 20%, and the lowest score has a weight of 10%. This means that your best scores will have the biggest impact on your course grade. Note that none of these can be completely dropped.

Midterm grades will be computed and submitted to the records office when requested. This grade will be computed in the following manner: Average of all quizzes up to this time (no drops) 50%. Average of all exams up to this time (no drops) 50%.

## Grade Scale

[90, 93)	A-	[93, 97)	A,	[97, 100]	A+,
[80, 83)	B-	[83, 87)	B,	[87, 90)	B+,
[70, 73)	C-	[73, 77)	C,	[77, 80)	C+,
[60, 63)	D-	[63, 67)	D,	[67, 70)	D+,
				[0, 60)	F

## Course & Instructor Policies

**Make-up exams** There will be *no* makeups except in extraordinary circumstances. Missed exams are a zero.

**Extra credit** n/a

**Late work** All students are expected to take the examinations at the announced time.

**Test Collection** All students are expected to collect graded quizzes and tests in a timely manner.

**Special assignments** Problems will be assigned on a regular basis. Answers to most of these problems are given at the back of the textbook. Complete solutions to many of these problems may be found in the Solutions Manual.

**Class attendance** Classroom attendance and problem session attendance (where applicable) is required.

**Classroom citizenship** Professional behavior is expected at all times. Classroom discussions are not permitted between students. Cellphones must be turned off at all times. Laptops may only be used for taking notes.

## Technical Support

If you experience any problems with your UTD account you may send an email to: [assist@utdallas.edu](mailto:assist@utdallas.edu) or call the UTD Helpdesk at 972 883-2911.

## Field Trip Policies

Off-Campus Instruction and Course Activities

Off-campus, out-of-state, and foreign instruction and activities are subject to state law and University policies and procedures regarding travel and risk-related activities. Information regarding these rules and regulations may be found at the website address [http://www.utdallas.edu/BusinessAffairs/Travel\\_Risk\\_Activities.htm](http://www.utdallas.edu/BusinessAffairs/Travel_Risk_Activities.htm) Additional information is available from the office of the school dean. Below is a description of any travel and/or risk-related activity associated with this course.

## Student Conduct & Discipline

The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. General information on student conduct and discipline is contained in the UTD printed publication, A to Z Guide, which is provided to all registered students each academic year. The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the Rules and Regulations, Series 50000, Board of Regents, The University of Texas System, and in Title V, Rules on Student Services and Activities of the university's Handbook of Operating Procedures. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (SU 1.602, 972/883-6391) and online at <http://www.utdallas.edu/judicialaffairs/UTDJudicialAffairs-HOPV.html> A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.

## Academic Integrity

The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.

Scholastic Dishonesty, any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details). This course will use the resources of turnitin.com, which searches the web for possible plagiarism and is over 90% effective.

## Copyright Notice

The copyright law of the United States (Title 17, United States Code) governs the making of photocopies or other reproductions of copyrighted materials, including music and software. Copying, displaying, reproducing, or distributing copyrighted works may infringe the copyright owners rights and such infringement is subject to appropriate disciplinary action as well as criminal penalties provided by federal law. Usage of such material is only appropriate when that usage constitutes "fair use" under the Copyright Act. As a UT Dallas student, you are required to follow the institutions copyright policy (Policy Memorandum 84-I.3-46). For more information about the fair use exemption, see <http://www.utsystem.edu/ogc/intellectualproperty/copypol2.htm>

## Email Use

The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues concerning security and the identity of each individual in an email exchange. The university encourages all official student email correspondence be sent only to a student's U.T. Dallas email address and that faculty and staff consider email from students official only if it originates from a UTD student account. This allows the university to maintain a high degree of confidence in the identity of all individual corresponding and the security of the transmitted information. UTD furnishes each student with a free email account that is to be used in all communication with university personnel. The Department of Information Resources at U.T. Dallas provides a method for students to have their U.T. Dallas mail forwarded to other accounts. Withdrawal from Class

The administration of this institution has set deadlines for withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, I cannot drop or withdraw any

student. You must do the proper paperwork to ensure that you will not receive a final grade of “F” in a course if you choose not to attend the class once you are enrolled.

## **Student Grievance Procedures**

Procedures for student grievances are found in Title V, Rules on Student Services and Activities, of the universitys Handbook of Operating Procedures.

In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance originates (hereafter called “the respondent”). Individual faculty members retain primary responsibility for assigning grades and evaluations. If the matter cannot be resolved at that level, the grievance must be submitted in writing to the respondent with a copy of the respondents School Dean. If the matter is not resolved by the written response provided by the respondent, the student may submit a written appeal to the School Dean. If the grievance is not resolved by the School Deans decision, the student may make a written appeal to the Dean of Graduate or Undergraduate Education, and the dean will appoint and convene an Academic Appeals Panel. The decision of the Academic Appeals Panel is final. The results of the academic appeals process will be distributed to all involved parties.

Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations.

## **Incomplete Grade Policy**

As per university policy, incomplete grades will be granted only for work unavoidably missed at the semesters end and only if 70% of the course work has been completed. An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester. If the required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of F.

## **Disability Services**

The goal of Disability Services is to provide students with disabilities educational opportunities equal to those of their non-disabled peers. Disability Services is located in room 1.610 in the Student Union. Office hours are Monday and Thursday, 8:30 a.m. to 6:30 p.m.; Tuesday and Wednesday, 8:30 a.m. to 7:30 p.m.; and Friday, 8:30 a.m. to 5:30 p.m.

The contact information for the Office of Disability Services is:

The University of Texas at Dallas, SU 22  
PO Box 830688  
Richardson, Texas 75083-0688  
(972) 883-2098 (voice or TTY)

[disabilityservice@utdallas.edu](mailto:disabilityservice@utdallas.edu)

If you anticipate issues related to the format or requirements of this course, please meet with the Coordinator of Disability Services. The Coordinator is available to discuss ways to ensure your full participation in the course. If you determine that formal, disability-related accommodations are necessary, it is very important that you be registered with Disability Services to notify them of your eligibility for reasonable accommodations. Disability Services can then plan how best to coordinate your accommodations.

It is the students responsibility to notify his or her professors of the need for such an accommodation. Disability Services provides students with letters to present to faculty members to verify that the student has a disability and needs accommodations. Individuals requiring special accommodation should contact the professor after class or during office hours.

## Religious Holy Days

The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated. The student is encouraged to notify the instructor or activity sponsor as soon as possible regarding the absence, preferably in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment. If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee.

*These descriptions and timelines are subject to change at the discretion of the Professor.*